AEA

Lenders' Independent Environmental Consultant Site Visit Report: September 2009

Sakhalin II (Phase 2) Project

Report to Sakhalin II (Phase 2) Project Finance Parties

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List of Abbreviations

AEA	AEA Technology plc, Independent Environmental Consultant
BAP	Biodiversity Action Plan
BG	Biodiversity Group
BS2	Booster Station 2
CMT	Crisis Management Team
CTA	Common Terms Agreement
ECT	Emergency Coordination Team
HSES	Health, Safety, Environment and Social
HSESAP	Health, Safety, Environment and Social Action Plan
IEC	Independent Environmental Consultant
KChS	Commission for Emergencies and Fire Safety
Lun-A	Lunskoye-A platform
NGO	Non-Governmental Organisation
OET	Oil Export Terminal
OPF	Onshore Processing Facility
OSRP	Oil Spill Response Plan
OSRV	Oil Spill Response Vessel
RemAP	Remedial Action Plan
RoW	Right of Way
Sakhalin Energy	Sakhalin Energy Investment Company Ltd.
SEW	Sakhalin Environment Watch
TLU	Tanker Loading Unit

Executive Summary

AEA Technology (AEA) conducted a site visit to the Sakhalin II Phase 2 project on behalf of the lenders from 16th to 24th September 2009. The site visit agenda included observation of the Biodiversity Group in support of the Biodiversity Action Plan, helicopter flyover of the Right of Way (RoW) to review the condition of rivers, reinstatement, erosion control, wetlands and access issues, site visit to Booster Station 2 and observation of the Oil Spill Response drill held on 23rd September. Discussions were held with Sakhalin Energy regarding the initial stages of the development of the Operations Health, Safety and Environment and Social Action Plan. Meetings were also held in Sakhalin Energy offices to discuss effluent discharge issues at Lunskoye-A platform and the Onshore Processing Facility (OPF).

Biodiversity Group (BG)

The third meeting of the BG was held on 17th September 2009. A sufficient number of members were in attendance to provide a quorum. Announcements were made concerning action items from the previous meeting, including the request for a seed bank for rare and protected plants species (Sakhalin Energy has yet to approve this request) and the development of a Priority Matrix to focus biodiversity conservation efforts on certain species and habitats including the western gray whale, Stellar's sea eagle, Sakhalin taimen, wetlands, ballast water, Chaivo spit and Old Growth dark coniferous forest. Some members of the group requested a more detailed Priority Matrix to include specific projects developed to protect the above-mentioned species and habitats.

Following a series of presentations, primarily focused on birds, the group engaged in open discussion. The main topics included: a debate concerning the amount of foreign involvement in research, requests for Sakhalin Energy to more transparently share survey data, pleas for more detailed flare monitoring, calls for more international cooperation in the oil spill response planning, and demands for the inclusion of the Oil Spill Response Plan (OSRP) into the Biodiversity Action Plan (BAP).

Following these discussions, a final vote was held concerning the adoption of the BAP as an official working, live document, which will be updated by Sakhalin Energy where necessary to reflect significant new information. The vote to adopt the BAP was approved, with future recommendations for Sakhalin Energy to be more transparent particularly with survey data, to include flare information in reports, provide OSRP information, and further involve Japanese researchers. Upon adoption of the BAP, the BG will now work to create a Regional BAP to include other entities such as ENL, Rosneft, Gazprom, Sakhalin Railways, and other potential future operators in Sakhalin.

Right of Way

AEA surveyed the entire RoW by way of a Sakhalin Energy helicopter flyover on 20th September 2009 and access to view a GIS linked database of video footage from previous Sakhalin Energy aerial surveys. This has not previously been possible and proved quite valuable at assessing the overall condition of the RoW. Observation and evaluation focused on river crossings, reinstatement and erosion control, wetlands and RoW access. Site visits were conducted by road to the Gornaya River crossing and Booster Station 2.

Reinstatement and Erosion Control
In general, the RoW appeared in a good physical state; however, as expected on a lengthy RoW, continued monitoring and maintenance must occur. AEA was pleased to learn that Sakhalin Energy has a dedicated crew patrolling the RoW, on foot, to identify areas requiring maintenance. The engineering and construction efforts at river crossings are providing ample protection to riverbanks and salmon spawning habitats. While a vast amount of damage caused by recent typhoons was visible to many riverbanks off the RoW (eroded banks, altered pathways, felled trees, damaged bridges), no significant damage was observed within the RoW during this visit. With the exception of Gornaya River, gabion walls confined river flows to their intended paths preventing stream migration

and erosion, riprap and reno matting protected river and banks thus preventing erosion and loss of trees, and silt fences (where installed) continued to prevented sediment flow from slopes to water bodies. Overall, the incident at Gornaya River is viewed as a positive situation, showing AEA that Sakhalin Energy does have the ability to react appropriately to such situations. It was also noted that Sakhalin Energy is now taking a proactive stance to prevent similar situations from occurring at other river crossing areas.

Currently, the erosion control installations along the RoW are performing well, despite regeneration being slower than anticipated in most areas along the RoW. Nothing was observed that currently presents a material environmental hazard, however it is anticipated that several locations where AEA observed lack of regeneration, formation of small erosion rills and trenches, eroding side cuts resulting in loss of trees, failed slope breakers, and sediment flowing off the RoW into forested areas will require attention in the future. Bridge removal remains an ongoing action item from the Remedial Action Plan (RemAP). AEA understands that Sakhalin Energy is currently preparing a plan concerning the removal or replacement of the remaining bridges, and requests to see this plan once developed (due for completion in February 2010).

Wetlands
Overall, wetland reinstatement seems to be progressing well – the island's wetlands areas show very positive signs of recovery and very little subsidence or crowning above the pipelines was observed. However, the Dolinsk wetland in the southern portion of the island is the exception. A running track consisting of hundreds of trees and various wooden and steel bog mats has not been removed during reinstatement activities. Both the RemAP and Wetlands Reinstatement Plan require that all foreign materials placed into a wetland be removed if physically possible following construction, and most recently, wetlands have been included in the BG Priority Matrix. AEA understands that Sakhalin Energy has since surveyed the area to identify the type, location and quantity of debris that to be removed, and is currently utilising the frozen ground to begin the removal process.

Local Access
During the flyover, it was apparent that a large number of locals are regularly using the RoW. Sakhalin Energy has maintained proper access to public roads that cross the pipeline while preventing access to the RoW from these public roads. Currently, a threat does not appear to exist from the locals' use of the RoW, however Sakhalin Energy is encouraged to monitor the access points and activities of those using the RoW to ensure there is no future threat to the pipelines.

Booster Station 2
Booster Station 2 (BS2) is rapidly approaching commissioning stage and full operations. A site visit conducted on 19th September revealed that BS2 is largely in compliance with health, safety and environmental requirements. Observations of areas needing improvement (primarily relating to health and safety) include the need for better management of construction debris, site security (the side access gate was completely unguarded allowing open access to all), ventilation of the inert gas storage building, operation of the old sewage treatment facility at nearly four times capacity, and inspection of scaffolding; however, the vast majority of those checked were within inspection code. Despite these issues, BS2 displayed a high level of compliance.

Sewage Treatment and Discharge Concentrations
During the site visit, it was additionally brought to AEA's attention that the BS2 sewage treatment facility was operating at well above capacity, and that the Lunskoye-A platform and OPF were releasing effluents with concentrations well above the RF regulations. It was noted that this has been occurring for several months. A meeting was held with Sakhalin Energy to gather more information concerning the causes of these issues, potential solutions to these issues, and methods to avoid similar future issues. It was noted that measures have been instituted to bring these issues into compliance. AEA has requested that data concerning non-compliance issues relating to water discharges be included in future monthly and quarterly reports in order to more quickly address any such future occurrences.

Oil Spill Response

Representatives from AEA and independent oil spill response experts, PCCI Inc., attended Sakhalin Energy's oil spill response and equipment deployment exercise in Aniva Bay on 23rd September 2009, to evaluate Sakhalin Energy's capabilities and readiness to respond to oil spills, and to assess the equipment and capability for dealing with oiled wildlife. Office discussions followed the exercise, focussing on PCCI's comments on Sakhalin Energy's seven current Oil Spill Response Plans (OSRPs) and the plans for updating and improving these OSRPs.

Oiled Wildlife Rehabilitation Programme
Sakhalin Energy provided a full demonstration of its newly acquired wildlife rehabilitation kits at the Aniva Bay shoreline, including equipment for wildlife deterrence, capture and stabilisation, constituting industry best practice. Sakhalin Energy's wildlife response Programme Manager was found to be particularly experienced and knowledgeable in all aspects of preventing oiling and oiled wildlife rehabilitation. This employee is not a full-time Sakhalin Energy employee; Sakhalin Energy is encouraged to identify a full-time employee with similar skills. The "Oiled Wildlife Responders Field Manual", intended specifically for Sakhalin Energy's wildlife response equipment and wildlife known to occur in Sakhalin, was considered very well written in presentation and content; and a few minor modifications were suggested and agreed.

Corporate Oil Spill Response Exercise
AEA was informed at the pre-exercise meeting that the size of the field exercise – originally planned to involve a large offshore spill associated with the Tanker Loading Unit (TLU) and a large, separate onshore spill associated with a transferred oil metering station at the Oil Export Terminal (OET) – was to be scaled back. The last minute changes to the anticipated volume, as well as the confinement of the lenders' representatives to one small shore location at the OET, reduced the effectiveness and ability of AEA and PCCI to evaluate Sakhalin Energy's offshore operations. This also impacted the team's ability to evaluate the activation and decision-making processes of the Emergency Coordination Team (ECT) and Crisis Management Team (CMT). A video recording of this exercise was made and provided to the lenders' representatives in January 2010. This video has been reviewed by PCCI in Appendix 2 to this report.

It is recommended that a larger exercise be conducted within a year, ideally enabling the Japanese authorities to participate and thereby providing a great training opportunity to facilitate international co-operation.

The overall impression of the AEA/PCCI evaluation team was that this event seemed more of an equipment deployment demonstration than a simulated response exercise. There was a seeming lack of urgency displayed by responders, and in particular onshore boom deployment was considered slow. Protection of the Goluboi Stream, a salmon river, was good but the strategic positioning of the boom and skimmer for collection at the shoreline could have been better. Offshore activities were barely visible from the beach vantage point, although it appeared that the oil spill response vessels (OSRV) and other vessels were able to deploy offshore boom and conduct skimming operations without substantial delay or confusion.

OSRP Updates and Improvements
PCCI also discussed the current asset-specific Oil Spill Response Plans (OSRPs) with Sakhalin Energy's Oil Spill Readiness and Response Manager, specifically where the OSRPs were considered to fall short of international best practice and standards in relation to worst case scenarios, secondary containment and pre-planning for the use of non-mechanical response methods such as in-situ burning and dispersants. Sakhalin Energy concurred with PCCI's suggestions and planning for a potential breach of secondary containment, one of PCCI's primary comments, will now go forward.

Operations HSESAP

A discussion was held between Sakhalin Energy, AEA and Lenders regarding the 'Operations HSESAP', currently in development as per Schedule 8 section 6.3 of the CTA. Sakhalin Energy wishes to integrate the Operations requirements and commitments from the existing HSESAP into its

own HSE and Social standards and monitoring programmes. It is intended that integration will result in direct alignment and transparent mapping of the current HSESAP commitments with Sakhalin Energy Standards.

While the draft document eliminates most items relating to the design and construction phases, a few select items remain as they have not yet been completed (e.g. bridge removal and subsequent reinstatement). These items will remain in the Operations HSESAP until the time of completion, at which time they may be removed. Public disclosure of the document, upon completion, will in principle remain unchanged.

Sakhalin Energy presented a draft sample section of their proposed Operations HSESAP to explain their approach and request in-principle Lender support. Further discussions will continue between Sakhalin Energy and AEA, on behalf of the Lenders, to ensure that the original HSESAP requirements relating to operations and outstanding construction activities are maintained in full.

Table of Contents

Appendices

1 Introduction

AEA Technology (AEA) is the Independent Environmental Consultant (IEC) acting on behalf of the lenders to the Sakhalin II Phase 2 project (the 'Project'). Under the Terms of Reference of our engagement, AEA and Lender representatives undertake periodic site monitoring visits to the Project. This report presents the findings of the site visit undertaken between the 15th and 24th of September 2009.

The main focus of the site visit was twofold:

- An assessment was made of the progress made on reinstatement of the pipeline RoW, in particular against the Remediation Action Plan (RemAP) for Rivers, Erosion Control and Reinstatement & Wetlands developed by Sakhalin Energy Investment Company Ltd. (Sakhalin Energy) in response to non-compliance issues previously raised by AEA during the construction period. An extensive inspection of the pipeline RoW was undertaken across all construction sections via a helicopter flyover of the Right of Way (RoW) and observation of previous flyover footage. The recently repaired Gornaya River crossing location was visited by road.

- AEA and its independent oil spill response subcontractors (PCCI Inc.) observed and assessed the oil spill response exercise conducted by Sakhalin Energy in Aniva Bay on 23rd September 2009.

In addition, the September 2009 site visit also assessed:

- Oil Spill Response Plan progress
- Biodiversity Group meeting and Biodiversity Action Plan development
- Booster Station 2
- Wetland issues
- Water discharge concentrations and reporting
- Health, Safety, Environment and Social Action Plan (HSESAP) structure and reporting

2 Biodiversity Group

The Biodiversity Expert Working Group, or Biodiversity Group (BG), was created in August 2007 by the decision of the Ecological Council of the Sakhalin Oblast. The BG includes representatives of the government environmental agencies (federal and regional), commercial and scientific organisations, international experts and representatives from Russian and international non-governmental organisations (NGOs). The two main objectives of the BG are 1) to assist in the development and implementation of regional and corporate biodiversity related plans and programmes, including discussion of their results, and 2) to provide expert advice and recommendations to governmental and commercial institutions, as well as NGOs, with regard to the issues related to the conservation of biodiversity of Sakhalin.

The third meeting of the BG was held on 17th September 2009 at the Mega Palace Hotel in Yuzhno, Sakhalin. Fourteen of the seventeen members were present providing a quorum. The main discussion items of the third meeting were the Priority Matrix, developed by Sakhalin Energy, and accepting and adopting the Biodiversity Action Plan (BAP), also developed by Sakhalin Energy, as an official working, live document. Several presentations were also provided on various topics and discussions were held concerning these, as well as discussing old items.

2.1 Presentations

Sakhalin Energy, Dr. Keisuke Saito, Minoru Kashiwagi and Dr. Masterov presented several oral reports relating to biodiversity issues in Sakhalin and Japan. Each presentation was open to group discussion.

2.1.1 Sakhalin Energy Presentation

Dr. Brian Tibbles of Sakhalin Energy presented an overview of biodiversity action plan development internationally in the UK, in the Russian Federation, and in Sakhalin Energy, emphasising that, to be effective, planning must be an inclusive process guided centrally.

To illustrate the cumulative effects that activities of companies, industries, and government organisations may have on biodiversity, the presentation referred to examples from scientific literature of barrier and edge effects caused by linear infrastructure on forests, where microclimatic changes and fear of predation had impacted biodiversity in certain international locations.

The presentation also discussed the biodiversity planning framework in the Russian Federation, and compared it to similar frameworks in other countries that, like Russia, have ratified the Convention on Biological Diversity, and noted that a regional BAP has not yet been developed for Sakhalin to guide biodiversity planning by various organisations.

The presentation ended by posing two key questions:

- What plans does Sakhalin Oblast Administration have to develop a regional biodiversity strategy and BAP?
- Does the Biodiversity Group intend to extend their membership to other companies and government partners?

2.1.2 Dr. Saito Presentation

Dr. Saito, Director and Chief Veterinarian of the Wildlife Biomedicine Institute, Japan, and Chairperson of the Japan and Sakhalin Wildlife Protection Organisation, presented information to the group concerning a recent oiled-bird event along the shores of Hokkaido, Japan. Photos showed hundreds of oiled sea birds washing up on Hokkaido shores. Investigations were conducted in Japan to determine the origin of the spill. Oil fingerprinting determined that the oil was Bunker C oil coming from Russia. The purpose of the presentation was to point out that the Russian Federation did not

make an announcement concerning the spill until after the Japanese government sent an official letter stating that Japan would announce the spill if Russia did not. This raised much concern in Japan about communication and co-operation in the event of a spill. Hokkaido supports a vast population of sea and shore birds as well as the heart of the Japanese fishing industry. The protection of the shores and fishing areas relies on early warning from Russia in the event of a spill.

Due to these concerns, Dr. Saito and other Japanese NGOs request that the BAP is linked to the Oil Spill Response Plans (OSRP) and Wildlife Response Plan. AEA does not see the need to link the BAP to the OSRP as the purpose of the BAP is to address known impacts, not hypothetical impacts caused from a potential event that may never occur. Dr. Saito also wishes to see greater cooperation between Sakhalin Energy and Japan in the event of a spill since Japan is better equipped to treat and rehabilitate oiled birds.

2.1.3 Minoru Kashiwagi Presentation

Minoru Kashiwagi, Director of Japanese Marshlands Actions Network, presented information on wetlands birds in Sakhalin, focusing on several Red Book and rare species that use Sakhalin Island as a breeding or migration area. Kashiwagi stressed the importance of shore birds as indicators of a healthy ecosystem. He argued that more research should be conducted in cooperation with Japanese ornithologists concerning Sakhalin shore birds. He also agreed that the BAP should be linked to the OSRPs and should also include a restoration plan and abandonment/decommissioning plan. Sakhalin Energy responded that decommissioning would not occur for another 40 years; detailed plans will be prepared in the future but do not belong in the BAP.

2.1.4 Dr. Masterov Presentation

Dr. Masterov gave a brief presentation on Stellar's Sea Eagles on Sakhalin Island. Dr. Masterov impressed upon the group the importance of Sakhalin Island on the survival of the species as Sakhalin eagles represent up to 20% of the worldwide population according to current estimates. He listed the major threats to the eagles as: disturbance during nesting season, which causes adults to abandon nests, extremely high bear predation (nearly 50% of chicks are lost to bear predation) and high levels of poaching. Future plans to protect eagles include continued monitoring and construction of preventative measures against bear predation (encasing nest trees with metal to prevent bears from climbing, which has proven effective thus far).

2.2 Priority Matrix

During the previous BG meeting, held in November 2008, Sakhalin Energy was tasked with developing a Priority Matrix to prioritise species and habitats to be protected among the many listed in the BAP. Sakhalin Energy provided a Priority Matrix as a list of seven specific species and environments located on Sakhalin:

- Western Gray Whale
- Stellar's Sea Eagle
- Sakhalin Taimen
- Wetlands
- Ballast water
- Chaivo spit
- Old Growth dark coniferous forest

Some members of the group requested a more detailed Priority Matrix to include specific projects developed to protect the above-mentioned species and habitats. Sakhalin Energy responded that its focus will be to prepare and implement Habitat Action Plans and Species Action Plans rather than creating a more detailed priority matrix.

2.3 Discussion Items

Throughout the course of the BG meeting several items were announced, discussed or voted upon, including the following:

- During the last meeting, the Botanical Garden proposed the creation of a seed bank for rare and protected species. This request is waiting approval by Sakhalin Energy.
- Several concerns were reiterated including the request to monitor the flare at the LNG facility, a desire to access Sakhalin Energy survey data, overlap of various plans, removal of the reference to US and Japanese forests in Chapter 8 of the BAP, and restriction on the use of foreign specialists.
- It was agreed that the BAP is a live document, which may be updated as new information is acquired, particularly from ongoing surveys.
- The Dean of Sakhalin University (and Vice-Chair of the BG) pleaded with the group to stop criticising the BAP and move forward. He also requested the group consider including foreign entities to provide expertise in areas where Russia is lacking.
- The final vote to adopt the BAP was approved by a margin of 12-1, with future recommendations for Sakhalin Energy to be more transparent particularly with survey data, to include flare information, provide OSRP information and further involve Japanese researchers.
- Upon adoption of the BAP, the BG will now work to create a Regional BAP to include other entities such as ENL, Rosneft, Gazprom, Sakhalin Railways, and potential future operators in Sakhalin.

3 Right of Way

The entire length of the RoW was surveyed during this monitoring visit. The RoW from Nogliki to the LNG plant in the south was observed during a helicopter flyover on 20th September 2009. The following day, Sakhalin Energy databases were accessed to view GIS linked video footage of previous Sakhalin Energy aerial surveys to view the RoW from Nogliki to landfall in the north. Videos from flyovers conducted in 2007, 2008 and 2009 were viewed. AEA notes that the GIS based video footage database is a very powerful tool and encourages Sakhalin Energy to allow RoW monitoring and reinstatement crews to have more open access to the system to better track and monitor areas of potential concern along the RoW.

3.1 River Crossings

River bank protection and maintenance have been a major focus of RoW visits for the last few years. Following the spring thaw and two typhoon events on Sakhalin this summer, rivers were again a major focus during the September 2009 site visit. The helicopter flyover of the RoW allowed AEA to view the condition of all rivers crossed by the pipeline RoW. While a vast amount of damage caused by the typhoons (eroded banks, altered pathways, felled trees, damaged bridges) was visible to many riverbanks off the RoW (Photo 1), the engineering and construction efforts along the RoW provided ample protection (Photo 2). With the exception of Gornaya River (detailed below), gabion walls confined river flows to their intended paths and prevented stream migration and erosion, riprap and Reno mat protected river banks preventing erosion and loss of trees, and silt fences, where installed, prevented sediment flow from slopes to water bodies. No significant damage to riverbanks within the RoW was observed during this monitoring visit.

3.1.1 Gornaya River

A special site visit to the Gornaya River was conducted on 19th September 2009. AEA requested this site visit based on reports and photos provided by Sakhalin Energy relating to recent typhoon events, which caused the river to change path. The new path, cutting through a natural oxbow in the river, removed a large number of trees, eroded approximately one metre of soil and subjected the area around the pipeline to scour and erosion (Photo 3). The oil pipeline and fibre optic cable were left exposed, yet undamaged. Sakhalin Energy immediately identified the situation as a potential problem and addressed the situation by implementing new engineering techniques. A new fortified bank (temporary) was constructed along the oxbow where the river had broken through to re-establish the natural path of the river. The washout area was dewatered and Reno mats were constructed to protect the pipelines. Gabion walls were built to confine and control flows in the event of a similar occurrence in the future (Photo 4). Engineers are currently developing plans to replace the temporary bank with a more permanent structure, likely to include Reno mats and gabion walls.

Overall, the incident at Gornaya River is viewed positively: it alerted Sakhalin Energy to the potential destructive power of nature on Sakhalin Island and showed AEA that Sakhalin Energy does have the ability to react appropriately to such situations. It was also noted that Sakhalin Energy is now taking a very proactive stance to prevent similar situations from occurring at other river crossing areas. Sakhalin Energy has identified several other areas with the potential for similar incidents to occur, and engineers are developing methods to protect these areas before such an incident occurs.

3.1.2 Salmon Fishing Data

AEA was also informed that salmon fishing data for this year indicate another record salmon year. While fishing data and spawning ground preservation techniques are only loosely linked, this is viewed as a very positive indicator that Sakhalin Energy's riverbank protection and salmon spawning ground preservation techniques are, in the short term, effective. Monitoring will continue, both by Sakhalin Energy and AEA, to ensure proper maintenance continues at these sensitive sites as required.

3.2 Reinstatement and Erosion Control

Reinstatement and erosion control have been a focus on previous site visits and will continue to be a focus on future visits. The existing erosion control methods and their installation along the RoW are currently performing well, despite regeneration being slower than anticipated in most areas along the RoW (Photo 5). Several locations were identified along the RoW that will require attention in the future, however nothing was observed during this visit that would create any significant environmental hazard at this time.

Sakhalin Energy has created a dedicated team who will routinely survey the RoW, both on foot and from the air, to identify areas that require maintenance or improved methods of erosion control. Certain aspects relating to the success of reinstatement and erosion control requiring constant monitoring and maintenance include:

- Lack of regeneration, particularly important on slopes (Photo 6)
- Formation of erosion rills and trenches (Photo 7)
- Eroding side cuts resulting in loss of trees (Photo 8)
- Failed slope breakers (Photo 9)
- Sediment flowing off the RoW into forested areas (Photo 10)
- Removal of imported material from wetlands (detailed in section 3.3 below).

The removal of bridges (Photo 11) and subsequent reinstatement of the riverbank beneath remain outstanding issues. The actual number of bridges to be removed has not been provided to AEA but is assumed to be approximately 60. Sakhalin Energy anticipates bridge removal to commence shortly, as soon as water use licenses allow construction along the riverbanks. Sakhalin Energy will provide AEA with the bridge removal plan, which should include the number of bridges to be left in place or replaced with new bridges, the number of bridges to be removed, and the timeframe for removal. AEA is advised that this plan will be prepared by the end of February 2010.

Despite the above highlighted aspects, which will require maintenance in the future, most areas of the RoW appear stable. The vast majority of the technical reinstatement – most prominent on steep slopes, sandy areas, river crossings and fault crossings – appear intact (Photo 12). While regeneration is poor in many areas, overall, revegetation in wetlands is more prominent than in other areas. In many areas of farmland, the RoW is indistinguishable from surrounding crops (Photo 13).

3.3 Wetlands

Wetland reinstatement seems to be progressing well with one major exception in the Dolinsk Wetlands. In general, the wetlands areas throughout the island show very positive signs of recovery. Regeneration in wetland areas far exceeds that seen in other areas along the RoW. Successful reinstatement of a wetland area requires 80% vegetative cover after five years; most wetland areas previously disturbed by Sakhalin Energy appear to be approaching this requirement. Additionally, very little crowning or subsidence along the pipelines was observed. Both crowning and subsidence can affect the hydrologic flow of a wetland, resulting in pooling water or desiccation, which in turn may have an impact on the vegetation and soils. No areas of obvious desiccation were observed and only a few areas of minor pooling were visible from the air.

The flyover of the Dolinsk wetlands in the south (approximately KP 525-535) revealed a different status. While regeneration is fairly good in the area, long stretches of both crowning and subsidence over the oil and gas pipelines was apparent (Photo 14 and Photo 15). This has resulted in much pooling in the subsided areas and an impediment to surface water flow in the crowned areas.

Of greater concern was the presence of the running track and construction debris, specifically bog mats left on the RoW (Photo 16 and Photo 17). During construction, a running track consisting of hundreds of trees (cut during RoW clearing) was placed in the wetland to allow safe construction access. According to the Remedial Action Plan (RemAP), all foreign materials placed in a wetland must be removed if physically possible following construction. This commitment was repeated in the Wetlands Reinstatement Plan and most recently, wetlands have been included in the BG Priority

Matrix. AEA had previously been informed that the running track had been removed from the Dolinsk wetlands.

In addition to the running track, bog mats – both steel and wooden varieties – were used during construction in the wetlands to prevent vehicles from sinking. AEA notes that dozens of these bog mats still remain abandoned in the wetland; these were clearly visible from the aerial survey. This issue was previously unknown to the Sakhalin Energy operations staff. The failure to remove these items is a breach of commitments made in the HSESAP, RemAP, and Wetlands Reinstatement Plan and may hinder the successful and timely reinstatement and revegetation of the wetland.

AEA understands that Sakhalin Energy has since surveyed the area to identify the type, location and quantity of debris to be removed, and has initiated a removal plan utilising the frozen ground to gain safe access to the wetland whilst minimising vegetation damage. The debris is being cut into smaller pieces before being removed from the area.

3.4 RoW Access

Access to the RoW for locals is always an issue with pipeline projects and must be handled with care. Access should be limited, as locals (non-operations staff, in general) could pose a threat to the pipeline. However, some access must be maintained as the pipeline crosses areas historically used by locals for fishing, berry and mushroom picking, as picnic areas, and public roads.

During the flyover, it was apparent that a large number of locals are regularly using the RoW. This was evident by the number of people observed on the RoW during the flyover (over 100) and the number of vehicle tracks entering the RoW, most from overland travel in 4x4 vehicles rather than from roads or trails. Sakhalin Energy has maintained proper access to public roads, both large and small, that cross the pipeline, as well as preventing access to the RoW from these public roads. Concrete slabs have been placed over both oil and gas pipelines to prevent damage from vehicles at these crossings (Photo 18). Sakhalin Energy has also maintained large earthen berms at locations where the RoW crosses a public roadway (Photo 19). Both the concrete slabs and earthen berms appear effective.

Currently, a threat does not appear to exist from locals' use of the RoW. However, Sakhalin Energy is encouraged to monitor access points along the RoW and the activities of those using the RoW to ensure there is no future threat to the pipelines.

3.5 Booster Station 2

Booster Station 2 (BS2) located near Gastello (Photo 20) is a critical facility to the successful operation of the pipeline, and must be completed by December 2009. Currently, the facility is operated by diesel generators; upon completion the facility will operate on gas with significantly lower emissions. A monitoring visit was conducted to BS2 on 19th September 2009 to determine the overall schedule of BS2 operations and inspect the health, safety and environmental aspects of the facility.

Much work has been conducted at BS2 since AEA last visited the site. During the visit, crews were seen to be preparing for commissioning; the pipeline was being degassed (He and N_2 were used to hydrotest the pipe) in preparation for gas to be introduced to the pipeline on 22nd September 2009. Operations are scheduled to begin in late October / early November, well before the December deadline.

General positive observations around the facility include:

- "Going Live" safety posters posted in multiple locations and provided in three languages: English, Russian and Japanese.
- Three large (1,000 m^3 each) heated firewater tanks, on-site and operational.
- A large equipment storage / lay down yard lies within the site, with sufficient space to expand.
- Security cameras with motion and vibration detectors will be installed.

- Fuel drums and hoses are properly stored with secondary containment units in use.
- Proper concrete bunding around the three diesel generators (in operation).
- Proper concrete bunding around the two gas generators (not yet in operation).
- Proper concrete bunding around the three buildings used to store chemicals, lubricant oil and inert gases (however the inert gas building was not well ventilated). The buildings were also locked.
- Diesel storage tanks and refuelling area, properly bunded with concrete.
- Two large (600 m^3 each) oil treatment reservoirs, ready for operation.
- New microbial sewage treatment facility, nearly ready for operation.
- An organised centre to track and update current permits to work (PTW) within the facility; 202 PTW in six areas within BS2 at the time of the visit.

Some observations of areas needing improvement were also noted, including:

- Better management of trash is needed on the site – much construction debris is left lying around despite the presence of ample rubbish receptacles.
- The main entrance gate was well guarded and access is only permitted to those with proper identification and permission; however the side gate is completely unguarded allowing open access to all.
- The building used for inert gas storage was not well ventilated and could be hazardous to anybody inside in the event of a leak.
- Old sewage treatment facility operating at nearly four times capacity (discussed in more detail in Section 3.6).
- Some scaffolding was out of inspection; however, the vast majority of those checked were within inspection code.

3.6 Sewage Treatment and Discharge Concentrations

During the site visit, it was brought to AEA's attention that the BS2 sewage treatment facility was operating at well above its design capacity and that the Lunskoye-A platform and OPF were releasing effluents with concentrations well above the RF regulations. It was noted that these situations have been occurring for several months. A meeting was held with Sakhalin Energy to gather more information concerning the causes of these issues, potential solutions, and methods to avoid similar future issues.

3.6.1 Booster Station 2

The BS2 sewage treatment plant was designed to accommodate daily use by 250 individuals. At the time of the site visit, it was reported that the facility was housing approximately 500 individuals, with another 500 individuals on site during normal working hours. Thus, the sewage treatment plant has been operating at nearly four times capacity. Data concerning discharge volumes and concentrations could not be viewed at the time of the visit, and should be reviewed to determine if allowable concentrations have been exceeded. A new sewage treatment plant has been constructed within BS2. The system is a microbial system, which will be heated in the wintertime. Construction delays have postponed the operation of the facility until the end of September. At the time of the site visit, microbes ("bugs") were in place and growing, and the facility was scheduled to begin operating a few days after the visit.

3.6.2 Lunskoye-A Platform

The Lunskoye-A platform (Lun-A) has experienced several months of exceeding allowable discharge concentrations, particularly relating to suspended solids, BOD, phosphates, ammonia nitrogen and synthetic surfactants. While concentration levels were exceeded, the facility's discharge never exceeded the total allowable volume. Reportedly, the problem occurred when the sewage systems' volume intake was overloaded as grey water from laundry facilities were mixed with the sewage water.

This resulted in the release of untreated (or partially treated) sewage water. Lun-A releases its discharge to the sea. Temporary solutions have been enacted including diluting the discharge water to lower the concentrations. A permanent fix is also being constructed with a reroute of the grey water from the laundry facilities. The project should be completed by early 2010. Sakhalin Energy is paying penalties for not complying with the water use license, as per RF regulations.

3.6.3 Onshore Processing Facility

The Onshore Processing Facility (OPF) is also experiencing problems with its disposal water. Similar to Lun-A, discharge concentrations of phenols, total suspended solids and hydrocarbon content were exceeded but total volume discharged was not. Currently, treated process water from the MEG regeneration system routinely does not meet specifications. This is due to the failure of multiple filtration systems and separation packages including a Triqua separation package and both TWIN and MERPRO filtration packages. Currently, storm water is being added to the discharge water before injection into the well to meet concentration regulations. The dilution lowers concentrations to acceptable levels with the exception of phenols, which still exceed allowable concentrations. The installation of a new water plant is being considered as a permanent solution.

AEA was not aware of these situations before the site visit and were disappointed to be informed that they had been occurring for at least nine months. While AEA is pleased that a solution has been found, with the exception of phenols at OPF, it is discouraging that a simple and temporary solution such as dilution required nine months to devise. AEA has requested that data concerning non-compliance issues relating to water discharges be included in future monthly and quarterly reports in order to more quickly address any such future occurrences.

4 Oil Spill Response

PCCI and AEA representatives attended Sakhalin Energy's oil spill response and equipment deployment exercise in Aniva Bay on 23rd September 2009. The purpose of PCCI's participation in the exercise was to evaluate Sakhalin Energy's capabilities and readiness to respond to oil spills in the onshore, near shore and offshore environments surrounding the Prigorodnoye Oil Export Terminal (OET) and the associated subsea pipeline and Tanker Loading Unit (TLU).

In addition to evaluating the field equipment deployment and response activities, PCCI had the opportunity to meet Sakhalin Energy's Oil Spill Readiness and Response Manager, Mr. Dmitry Kuchai, and discuss PCCI's prior comments on Sakhalin Energy's current asset-specific Oil Spill Response Plans (OSRPs). Sakhalin Energy also briefed PCCI on continued efforts to update and improve their OSRPs.

The following report provides PCCI's comments and recommendations on three aspects of Sakhalin Energy's oil spill readiness:

1. Sakhalin Energy's wildlife rehabilitation programme and capability
2. The Aniva Bay oil spill response exercise
3. Sakhalin Energy's planned updates and improvements to their OSRPs.

4.1 Oiled Wildlife Rehabilitation Programme

In conjunction with the oil spill equipment deployment and exercise, Sakhalin Energy provided a full demonstration of their newly acquired wildlife rehabilitation kits, one of which is pre-staged at the OET. The demonstration included the set-up of all components of the kit on the Aniva Bay shoreline immediately adjacent to the OET. The equipment included:

- Propane gas air cannon hazing device (Photo 21)
- "Evil Eye" hazing device (Photo 22)
- "Scary Man" hazing device (Photos 23)
- Capture net on pole (Photo 24)
- Holding cages ('pet carriers') and cardboard boxes of various sizes for transporting oiled wildlife (Photo 24)
- Large capture net (Photo 25)
- Mobile spill response kit including personal protective equipment (Photo 26)
- Mobile bird washing station (Photo 27)
- Temporary holding aviary
- Temporary holding pools for wading / aquatic birds

Overall, the response kit contained equipment for wildlife deterrence, capture and stabilisation that constituted industry best practice. Sakhalin Energy's wildlife response Programme Manager, Petr van der Wolf, was particularly experienced and knowledgeable in all aspects of preventing oiling and oiled wildlife rehabilitation. Mr van der Wolf is not a full-time Sakhalin Energy employee; Sakhalin Energy is encouraged to identify a full-time employee with similar skills. Sakhalin Energy stated that, to date, it has 40 individuals trained in the use of the wildlife rehabilitation equipment. Sakhalin Energy has a plan in place to rapidly modify existing facilities at the OET to temporarily house and support up to 500 oiled birds in the event of a spill.

Though the equipment reflected state-of-the-art material, some of the wildlife deterrence equipment was not working as per manufacturer claims ("Evil Eye" did not float). Sakhalin Energy's technicians had designed some "modifications" to obtain maximum benefit from this equipment; however, AEA recommends that the equipment should be properly operated as per manufacturer's specifications, or else the equipment in questions should returned to/fixed by the manufacturer if a defect is determined to be the cause of the malfunction.

In addition to the wildlife response equipment, Sakhalin Energy demonstrated an "Oiled Wildlife Responders Field Manual" that they had developed. This manual was designed specifically for Sakhalin Energy's wildlife response equipment and identified wildlife known to occur in Sakhalin, including Red Book species. Overall, the Oiled Wildlife Responders Field Manual was considered very well designed and written in presentation and content, with only a few minor modifications required. It is understood that the version presented to PCCI and AEA was a preliminary draft, which will be updated.

The following are PCCI's specific comments and recommendations on Sakhalin Energy's Oiled Wildlife Rehabilitation Programme:

- It is recommended that Sakhalin Energy updates page 12 (and any subsequent references to particulate filter N95) of the draft "Sakhalin Energy Oiled Wildlife Responders Field Manual" to ensure it is clearly stated that this filter will NOT protect workers against vapour exposure normally encountered during oil spill response.
- It is recommended that additional information needs to be provided in this field manual to clearly identify and discuss selection and wearing of appropriate respiratory protection for field workers involved in the wildlife rehabilitation programme.
- It is recommended that Sakhalin Energy adds information and procedures on "electrical hazards" to the discussion on health and safety in the draft "Sakhalin Energy Oiled Wildlife Responders Field Manual." Electrical hazards pose an imminent threat to responders once the treatment centre is set up and operating.
- Since the Wildlife Rehabilitation Centre doubles as a vehicle maintenance and washing depot, it is recommended that Sakhalin Energy conducts an exercise in setting up the Wildlife Rehabilitation Centre to ensure that it can be changed over quickly and set up appropriately, and that all parts are available and in proper working order. Sakhalin Energy states that the centre can be changed from the vehicle maintenance depot to the Wildlife Rehabilitation Centre within 48 hours.

It is recommended that Sakhalin Energy establishes and conducts appropriate training and refresher training for all personnel involved in the Wildlife Rehabilitation Programme. The more recent training was conducted in January 2008. A programme that provided scheduled, regular, initial training and annual refresher training would provide Sakhalin Energy with a strong team of trained Wildlife Rehabilitation personnel that would be ready for responding to an oil spill.

4.2 Corporate Oil Spill Response Exercise

The Corporate Oil Spill Response (OSR) exercise was originally planned to provide opportunity to respond to two incidents – a large offshore spill associated with the TLU and a large, separate onshore spill associated with a transferred oil metering station at the OET. The extent and nature of these two oil spills would have resulted in the activation of Sakhalin Energy's Emergency Coordination Team (ECT) and Crisis Management Team (CMT). PCCI and AEA had planned to place an observer at each of these locations, as well as on an OSR vessel and at an onshore position, to evaluate Sakhalin Energy's response on behalf of the Lenders.

At the pre-exercise meeting, it was apparent that the scope and complexity of the exercise had been scaled back. The new exercise scenario consisted of single oil discharge from the TLU with this film moving towards the shoreline. The actual size of the simulated spill was smaller than originally implied by the draft plan provided to AEA, and did not require full participation of the CMT.

The revised exercise provided an opportunity to mobilise and deploy offshore resources to practice response tactics for containment and recovery operations, and onshore resources to simulate responses to shoreline protection and recovery operations. However, the restriction of all observers to one small onshore location did not allow the lenders' representatives to adequately evaluate the offshore portion of the exercise. PCCI considered the offshore oil spill response activity as the more important and challenging portion of the exercise. A video recording of this exercise was made and provided to PCCI and AEA in January 2010. This has been reviewed by PCCI – the review is presented in Appendix 2.

The revised OSR exercise programme, compounded by restrictions imposed on observation stations, did **not** provide an opportunity for the lenders' representatives to undertake adequate on-site observation and evaluation of:

- The activation and decision-making processes associated with the ECT or CMT
- Offshore operations.

The following are PCCI's specific comments and recommendations on Sakhalin Energy's onshore and offshore response exercise:

1. This exercise gave the impression that it was more of a deployment demonstration than a response exercise. Onshore deployment of the boom was slow; it took two hours to actually deploy the boom (Photo 28 and Photo 29). It is recommended that a future exercise be conducted that includes a sense of urgency. This would provide a better demonstration of the time needed to deploy the equipment. The AEA/PCCI team did note that all nearshore operations were conducted with a high degree of safety awareness.
2. Large equipment storage containers (Photo 30) were immediately delivered on site. These containers held most of the afore-mentioned equipment as well as skimmers (Photo 31), absorbent booms and temporary recovered oil storage tanks (Photo 32).
3. Strategic deployment of the onshore boom and skimmers needs to be practiced more. The protection of the Goluboi Stream, a salmon river, was good (Photo 33), but the deployment of the skimmer and collection at the shoreline could have been done better. The skimmer was often caught in the surf, greatly reducing its potential recovery efficiency. In addition, the collection boom should have formed a much narrower point of recovery (Photo 34). As deployed, the skimmer was tied to the boom, while there was approximately 50 or more feet of beach that would have been impacted by collected oil. Ideally, the boom should have formed a "V" just before the surf line and the skimmer should have been positioned in the narrow portion of the "V" just away from the surf line.
4. The rigid hull inflatable boats that were used to deploy the onshore boom were considered underpowered. The 20 horsepower motor was not strong enough to tow the lengths of boom efficiently. While it is recognised that there are weight issues with larger motors (although a 30 horsepower motor was carried to the beach and installed on the inflatable by two men with relative ease), an alternative to providing more towing power could be accomplished by providing additional rigid hull inflatable boats so that a team of vessels could tow the boom.
5. The prevention of the observers from being out on the recovery vessels hampered their ability to evaluate the offshore containment and response operations. Offshore activities were barely visible from the beach vantage point, even with binoculars. This also prevented the observers from watching the actual activities that occurred aboard the response vessels, including discussion of how to accomplish the strategies to recover the oil. It is recommended that the next exercise allow for suitably trained observers to be on the oil spill response vessels. This said, it appeared that the oil spill response vessels (OSRV) and other vessels were able to deploy boom and conduct skimming operations without substantial delay or confusion.

It is recommended that a much larger exercise be conducted within a year. This exercise should be of such magnitude that it encompasses oil impact within Japanese waters, enabling the Japanese authorities to participate. This would provide a great training opportunity to work internationally to clean up a potential major oil spill that could have far-reaching impacts on the environment.

4.3 OSRP Updates and Improvements

After the exercise and field deployment debrief, PCCI met with Mr Kuchai to review the status of PCCI's prior comments on where the OSRPs were considered to fall short of international best practice and standards.

Sakhalin Energy acknowledged that their onshore plans still required worst-case discharge scenarios that were not only larger in volume, but also flowed beyond the secondary containment measures and beyond the facility boundaries. Sakhalin Energy stressed that their first order of readiness was to develop plans that were fully approved by the Russian Federation, and the current scenarios are designed primarily to meet Russian standards. Sakhalin Energy concurred with PCCI that planning for spills that flowed beyond secondary containment and facility boundaries was best practice and such planning would now go forward.

Sakhalin Energy also acknowledged that considerably more work is required to move forward with pre-planning for the use of non-mechanical response methods such as in-situ burning and dispersants. PCCI stressed that without either pre-approved "zones" and conditions whereby these techniques could be quickly deployed, or at least an expedited approval process by the Russian Federation, the current framework for obtaining government approval to use non-mechanical response techniques would not be likely to work for an actual spill event. To ensure the effective use of these technologies, Sakhalin Energy must engage with the proper regulatory authorities and strive towards the identification of pre-approved zones and streamlined application-use procedures for in-situ burning and dispersants.

Mr Kuchai provided PCCI with an update on Sakhalin Energy's plans to revise, update and improve the OSRPs. It was Sakhalin Energy's intention to revise the OSRPs to incorporate and consolidate all common response procedures throughout Sakhalin Energy's operations.

5 Operations HSESAP

A discussion was held between Sakhalin Energy, AEA and Lenders during the September 2009 visit concerning the status of the HSESAP. This discussion primarily focused around the development of an 'Operations HSESAP', focusing on commitments relevant during the operations phase, and a method to streamline the reporting against these. This discussion was a follow-up to several discussions held during the May 2009 site visit. Sakhalin Energy presented a draft section of their proposed Operations HSESAP structure for explanation and review. The HSESAP structure and subsequent reporting are discussed in more detail below.

5.1 Operations HSESAP Structure and Reporting

The current HSESAP document was designed to incorporate all Project activities, occurring during all phases of the project including design, planning and pre-construction, construction, commissioning, operations and decommissioning. Many commitments are relevant for the duration of the Project. The development of an Operations Phase HSESAP is outlined in Schedule 8 section 6.3 of the CTA, and shall be designed to simplify the document by disapplying those commitment and/or standards that do not relate to operations, save in the event of any project expansions (e.g. new trains) or other construction activities (e.g. pipeline dig-ups).

During the May 2009 site visit, AEA and Sakhalin Energy agreed, in principle, to the development of a draft Operations HSESAP document and considered which commitments needed to be retained for operations, with a few outstanding issues to be reviewed by both parties. A draft, sample document focussing on Waste Management was prepared by Sakhalin Energy and presented to AEA during the September 2009 site visit. Upon in-principle approval of the Lenders, Sakhalin Energy will proceed to complete the Operations HSESAP based on the format and style of the draft provided.

The new Operations HSESAP document aims to integrate the requirements from the existing HSESAP with the Sakhalin Energy HSE and Social standards and monitoring programmes, including Part 1, Part 2 and Annexes A, B and C. Integration will achieve a direct alignment of the Sakhalin Energy standards with the HSESAP commitments while streamlining the reporting process. Further discussion will continue between AEA and Sakhalin Energy in order to finalise the document and its subsections. While the draft document eliminates most items related to design and constructions, a few select items remain, as they have not yet been completed (e.g. bridge removal and reinstatement). These items will remain in the Operations HSESAP until the time of completion, upon which time they may be removed.

5.2 Report Streamlining

During the May 2009 site visit Sakhalin Energy requested changes to the standard reporting processes, which has occurred throughout the life of the project. Traditionally, Sakhalin Energy has prepared detailed monthly and quarterly reports for the Lenders, as well as preparing separate monthly and quarterly reports for AEA. Sakhalin Energy proposed preparing either one monthly or one quarterly report, which will be sent to both AEA and the Lenders. After reviewing both reports (AEA version and Lender version), it was mutually decided that the two reports could be merged into one comprehensive report satisfying both Lender and AEA requirements. The single report has since been sent to both groups. The responsibility to ensure all relevant information from previous reports remains in the newly formatted report falls upon Sakhalin Energy. It was also decided that the frequency of the reporting (monthly and quarterly) will remain the same until project completion. Two main factors contributed to this conclusion:

1) A change in the reporting frequency would require an amendment to the CTA. This could be a long process for Sakhalin Energy and the Lenders and would result in little short term benefit, and

2) According to the CTA the reporting frequency changes upon project completion to a quarterly system. This is expected to occur during summer 2010 if all environmental commitments have been reached.

As agreed in May 2009, Sakhalin Energy will continue to prepare and submit both monthly and quarterly reports; however separate versions do not need to be prepared for the Lenders and AEA.

5.3 Transparency and Public Disclosure

AEA and the Lenders expressed concerns over the transparency of the new Operations HSESAP documentation, relating to clearly mapping existing HSESAP commitments to the new document, as well as the public disclosure process. Sakhalin Energy has ensured AEA and the Lenders that the Operations HSESAP will be a very transparent document. All commitments from the existing HSESAP will be incorporated into the new documents and all commitments will be referenced to the existing document for easy mapping and comparison. Public disclosure of the document, upon completion, would in principle remain unchanged; the document will be made available on the web as present, although the style and format will be updated. Further discussions will continue between Sakhalin Energy and AEA, on behalf of the Lenders, to ensure that the original HSESAP requirements relating to operations and outstanding construction activities are maintained in full.

6 Summary and Conclusions

Overall, AEA is very pleased with the observations made during the September 2009 site visit. A brief summary of our observations and a few comments and suggestions follow.

The third meeting of the BG ended on a positive note with the formal adoption of the BAP as a live, working document and the goal of the BG to adopt a Regional BAP involving other entities operation in Sakhalin. The overall message of the meeting however was that of a lack of confidence with Japanese NGOs concerning the Sakhalin Energy OSRP. AEA understands that these doubts exist because much of the OSRP information has not been shared.

It is highly recommended that Sakhalin Energy, through the BG or by some other means, shares OSRP information (including response capabilities and equipment) with the Japanese NGOs and Dr Saito, in particular. An element of international cooperation between Russia and Japan should also be added to the OSRP. It would be mutually beneficial if Japanese resources, particularly those dedicated to the treatment of oiled wildlife, were to be available to Sakhalin Energy in the event of a spill. These actions would build the NGOs' confidence in Sakhalin Energy's capabilities and improve relations, particularly within the BG.

In general, the RoW is in very good condition. Some minor maintenance issues were identified, as expected. Sakhalin Energy currently has a dedicated team focused on RoW maintenance, walking the entire RoW and identifying areas where additional works may be required. Additional reinstatement works are needed to remove the running track and bog mats in the Dolinsk wetlands; Sakhalin Energy will prepare a plan of action to address this issue. A bridge removal plan should also be prepared and presented to AEA. The GIS based video footage database, which was accessed by AEA with permission from Sakhalin Energy, is considered a very useful tool, and Sakhalin Energy is encouraged to allow crews responsible for RoW monitoring and reinstatement to have a more open access to the system to better track and monitor areas of potential concern along the RoW.

Sakhalin Energy identified and discussed issues relating to effluent concentrations at Lunskoye-A and OPF and the BS2 sewage treatment facility, which are operating above capacity. Solutions to the resolve the issues were enacted and presented to AEA. Due to the duration of these issues, AEA has requested this data be included in future monthly and quarterly reports.

Sakhalin Energy provided a full demonstration of its newly acquired wildlife rehabilitation kits at the Aniva Bay shoreline, including equipment for wildlife deterrence, capture and stabilisation, constituting industry best practice. Sakhalin Energy's equipment was found to be of very high quality. It is recommended to provide more float booms at the site and provide more frequent training on the use of equipment. The "Oiled Wildlife Responders Field Manual" was considered very well written and a few minor modifications were agreed.

AEA was informed at the pre-exercise meeting that the size of the field exercise was to be scaled back and that observers would not be allowed on the OSR vessels or the TLU. The last minute changes to the volume and simulated discharges, as well as the positioning of the observers, reduced the effectiveness and ability of the observers to evaluate response operations. As a result, this exercise did not provide the Lenders' representatives with an opportunity to observe and evaluate Sakhalin Energy's offshore operations or evaluate the activation and processes associated with the Emergency Coordination Team (ECT) and Crisis Management Team (CMT).

The overall impression was that this seemed more of an equipment deployment demonstration than a simulated response exercise; in particular, PCCI considered onshore boom deployment to be slow. Offshore activities were barely visible from the beach vantage point, although it appeared that the oil spill response vessels (OSRV) and other vessels were able to deploy offshore boom and conduct skimming operations without substantial delay or confusion. It is recommended that a much larger exercise be conducted within a year, ideally enabling the Japanese authorities to participate, providing a great training opportunity to facilitate international co-operation.

PCCI also discussed the current asset-specific OSRPs, specifically where the OSRPs were considered to fall short of international best practice and standards in relation to worst case scenarios, secondary containment and pre-planning for the use of non-mechanical response methods such as in-situ burning and dispersants. Sakhalin Energy concurred with PCCI's suggestions, and planning for a potential breach of secondary containment will now go forward.

Sakhalin Energy provided AEA with a draft section of the Operations HSESAP. This draft followed detailed meetings between AEA and Sakhalin Energy held during the May 2009 site visit. The new Operations HSESAP document aims to integrate the requirements from the existing HSESAP with the Sakhalin Energy HSES standards and monitoring programmes, including Part 1, Part 2 and Annexes A, B and C, while streamlining the reporting process. The new document will be very transparent, both maintaining all previous commitments and referencing these commitments to the old document. The public disclosure process will remain unchanged. Both Sakhalin Energy and AEA understand the importance of this process, and discussions will continue between Sakhalin Energy and AEA, on behalf of the Lenders, to ensure that the original HSESAP requirements relating to operations and outstanding construction activities are maintained in full.

Appendices

Appendix 1 – Photographs

Photo 1: Typical river view after typhoon, note number of felled trees and braided channel

Photo 2: Typical river reinstatement. Gabions and reno mats appeared effective; sediment on right bank shows level of elevated flows during typhoons.

Photo 3: **View of typhoon-related damage at the Gornaya River crossing, note one metre side cut in distance and recovered concrete weights displaced by storm flows.**

Photo 4: **New engineering design at Gornaya River being installed. Gabion walls and reno mats will prevent future damage from similar events.**

Photo 5: **Typical RoW reinstatement. Reno mats on river functioning properly; slope breakers and drainage intact on the slope.**

Photo 6: **Lack of vegetation along RoW is common. Slope and river protection techniques are effective despite lack of ground cover.**

Photo 7: **An area of small rills forming due to erosion. This is not an immediate concern but will require future maintenance.**

Photo 8: **Erosion on unprotected side cut, note felled trees. This is not an immediate concern but will require future maintenance.**

Photo 9: **Failed slope breakers allowing erosion and trench formation. This is not an immediate concern but will require future maintenance.**

Photo 10: **Rills carrying sediment off RoW into forested area (view blocked by helicopter fuel tank). This is not an immediate concern but will require future maintenance.**

Photo 11: **Many temporary bridges and running track left in place allowing local traffic to access RoW (note blue car approaching bridge). Also note excellent reinstatement aside from remaining running track. AEA understands that Sakhalin Energy will continue bridge removal and running track reinstatement this season.**

Photo 12: **Typical reinstatement. Slopes well protected from erosion with slope breakers, including drivable versions, despite the lack of ample revegetation.**

Photo 13: **RoW nearly indistinguishable from surrounding croplands. Running track and concrete slabs on public road (right hand side) show location of RoW.**

Photo 14: **Crowns remaining over both oil and gas pipes in wetlands. Note excellent revegetation aside from the crowns.**

Photo 15: **Subsidence along the RoW leads to pooling, particularly in wetlands. This is not an immediate concern but will require future monitoring.**

Photo 16: **Log running track remaining in the Dolinsk Wetlands. Also note prominent crown and pooling. Sakhalin Energy has agreed to identify a plan to address materials abandoned in the wetland.**

Photo 17: **Bog mats and trees remaining in the Dolinsk Wetlands. Sakhalin Energy has agreed to identify a plan to address materials abandoned in the wetland.**

Photo 18: **Concrete slabs and prominent berms, at left of photo, protect the pipelines from vehicle traffic on public trail and prevent illicit use of the RoW, respectively.**

Photo 19: **Large berms prevent locals from easily accessing the RoW from public roads, which remain open.**

Photo 20: **Booster Station 2 nearly complete, ready for commissioning in a few days and full operations within two months.**

Photo 21: **Propane gas air cannon.**

Photo 22: **Two "Evil Eye" hazing devices set up. Lack of floatation and movement makes them less effective.**

Photos 23: "Scary Man" hazing device auto inflates and deflates.

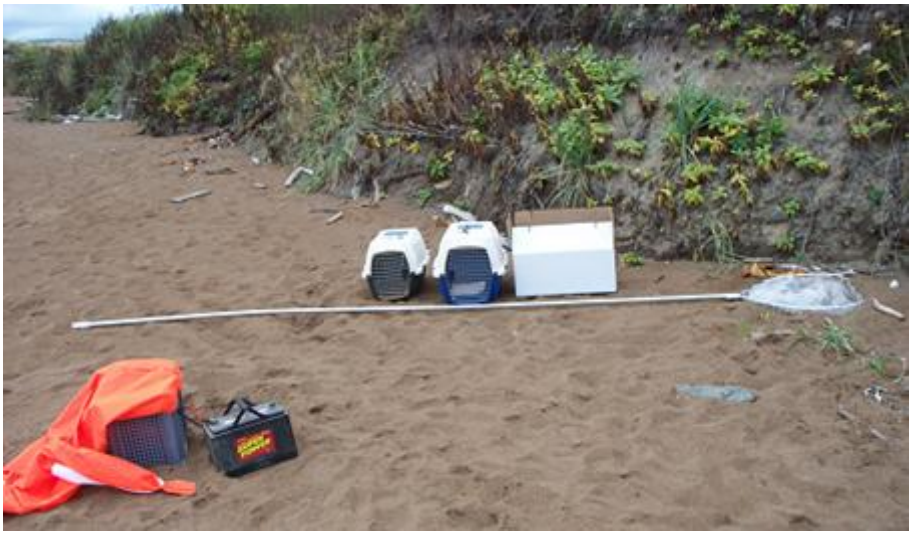

Photo 24: **Capture net, cages, ‘pet carriers’ and boxes to transport oiled wildlife.**

Photo 25: **Large capture net.**

Photo 26: **Wildlife response kit including personal protective equipment.**

Photo 27: Mobile bird washing station (yellow tent) set up to receive oiled birds on the beach.

Photo 28: Boom deployment by hand was time consuming.

Photo 29: Boom deployment with underpowered inflatable also slower than ideal.

Photo 30: Equipment storage containers and absorbent booms.

Photo 31: **Skimmer, hose and generator waiting for deployment.**

Photo 32: **Temporary recovered oil storage tank; hose is connected to a skimmer in the sea.**

Photo 33: **Triple boom protection of Goluboi River, a salmon river, was very effective.**

Photo 34: **Overall beach protection. Note skimmer in wave area and boom nearly perpendicular to shore.**

Appendix 2 – Review of Supplementary OSR Information

Background

AEA and PCCI participated as Observers for the evaluation of Sakhalin Energy's oil spill response exercise in Aniva Bay on 23rd September 2009. AEA provided a draft report of this exercise and other aspects of the site visit to both Lenders and the Company in January 2010. Subsequent to this report, AEA and PCCI were provided with three additional sources of information to consider for their final evaluation of the September oil spill exercise:

1. Sakhalin Energy's "PLAN of Integrated OSR Exercise at Prigorodnoye Production Facility" (Doc. No. 0000-S-90-01-P-0xxx-00-E, Revision 01)
2. Sakhalin Energy's "REPORT of Integrated OSR Exercise at Prigorodnoye Production Facility" (Doc. No. 0000-S-90-01-P-0xxx-00-R, Edition 01)
3. Seven video CDs showing live footage of the response operations taken from the Control Room, the beach adjacent to the OET facility, and offshore from the vessel AGAT.

PCCI has reviewed each of these additional sources of information and provides the following comments as an addendum to the main report.

Sakhalin Energy Documents

The AEA/PCCI team received an initial exercise plan prior to departing for Sakhalin Island. This plan described two 'tactical special exercise' scenarios: one offshore at the TLU and a second scenario at the OET shoreline. Upon arriving in Yuzhno on 22nd September 2009, the team was informed that the exercise would only involve a single spill from the tanker loading operations. AEA and PCCI were under the impression that this single scenario was much smaller than originally planned. Discussions with Sakhalin Energy exercise staff on 22nd September were understood to mean that there would be little to no exercise "play" by the Sakhalin Energy Commission for Emergencies and Fire Safety (KChS), Crisis management Team (CMT) or Emergency Coordination Team (ECT) in Yuzhno. Based on these conversations and recommendations, AEA and PCCI did not place any of their exercise evaluators with Sakhalin Energy in Yuzhno.

In reviewing both the Exercise Plan and Exercise Report, received in January 2010, it is evident that the KChS, CMT, and ECT were in fact notified and activated, and that the CMT and ECT played active roles in the decision-making of the response, including the tasking of personnel and equipment for both the offshore and the near shore response operations. In reviewing Sakhalin Energy's Exercise Report, it is unclear how the ECT and CMT performed in their assigned roles as the evaluation criteria were not established for these higher teams, although most planned actions (i.e. 75%) appeared to be completed in a timely fashion.

For future exercises of this scale or larger, AEA/PCCI strongly advocate having one or more evaluator(s) present with the CMT and ECT in Yuzhno.

Sakhalin Energy ORR Exercise Video Footage

PCCI's review of the video footage revealed considerably more equipment mobilisation and deployment than was evident from the on-shore observation point allocated to the evaluators during the exercise. Sakhalin Energy assembled and deployed all response equipment and systems in 'real time', for both offshore and nearshore response. For offshore operations, response equipment was assembled and deployed from the response and support vessels. This provided response personnel with an excellent training opportunity in the actual operating environment of concern, i.e. offshore waters surrounding the TLU.

PCCI did note some difficulties encountered during deployment of some of the larger pieces of offshore. In particular, some of the equipment did not appear to have lifting rings or lifting points, and

the rigging that occurred resulted in unbalanced loads. As a result, a considerable amount of swaying, manual positioning and additional tag lines were required during lifting operations in order to deploy the equipment over the side of the vessel.

The oil spill response vessels themselves did not appear to be modified or enhanced to facilitate the deployment and retrieval of the offshore response equipment. Fortunately, the sea conditions were nearly flat calm during the exercise; had they been heavier, PCCI suspects that the deployment of the larger pieces of equipment, including the Vessel of Opportunity Skimming System (VOSS), would have been significantly more difficult and potentially more dangerous to the equipment operators.

The labour teams generally worked well together during equipment deployment and operation, but in some cases there appeared to be multiple foremen or managers directing operations, including heavy material handling.

Overall, the difficulties and delays in assembling and deploying the large, offshore response equipment appeared normal for the early learning stages of new offshore response teams. PCCI recommends that Sakhalin Energy routinely conducts testing and assembly of the offshore response equipment at an onshore location to optimise assembly techniques and material handling strategies, including heavy lifts. Then, during exercise events, responders are able to deploy all necessary equipment and systems, including the offshore response equipment, in a safe and timely fashion.

PCCI also recommends that Sakhalin Energy's response personnel periodically train alongside experienced responders from other, established arctic oil spill response cooperatives, such as Alaska Clean Seas, Alyeska SERVS and Cook Inlet Spill Prevention and Response Inc (CISPRI). These organisations have similar equipment which they have routinely exercised and responded with many times over the previous 10-15 years.

Appendix 3 – Comments on SEW Press Release

Following the September 2009 environmental monitoring visit, AEA was made aware of a press release from local NGO Sakhalin Environment Watch (SEW) dated 20 October 2009. The letter provided links to further photos on its website.

AEA has reviewed the letter and photographs, but at this moment we do not feel that we can address the SEW letter any more specifically than has been written in this September 2009 site visit report. SEW's press release contains specific details and photographs of a few ROW and river crossing that were not visited during this monitoring visit, and without specifically targeted visits by AEA to these sites to view damage and any attempts at repairs, we do not feel that we can comment on specifics. As such, we do not think it appropriate to add a specific section related to the SEW letter to this September 2009 site visit report.

A general comment can be made that Sakhalin Energy undertakes regular inspections of the ROW, both from the air and on foot. These identify areas requiring maintenance or repair, and crews are available to carry out any work that may be needed. Following a major storm event such as the typhoon last year, there will inevitably be some damage along large areas of the ROW. Any repairs have to be prioritised to ensure that the major risk areas are dealt with first, such as where pipe is exposed. Where fibre-optic cable only has been exposed, the risk is not as great, allowing for this work to be carried out as a lower priority. The damage assessment and work at the Gornaya River crossing bear out that the system seems to be working, although we have made the point that, over such a long pipeline, there will need to be on-going maintenance and inspections for the lifetime of the project, with particular early emphasis on slopes and crossings that are struggling to regenerate following construction work.

AEA is continuing to undertake monitoring visits to the island, which include ROW maintenance as a specific audit item. Site visits to particular river crossings or slopes may be scheduled at the lenders' request alongside AEA's identified locations of interest. The next independent environmental monitoring visit to the ROW will be conducted in May 2010. A visit schedule is currently being prepared, which includes locations identified by SEW where access is possible. AEA will then be able to provide its opinion on the condition of these locations.

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