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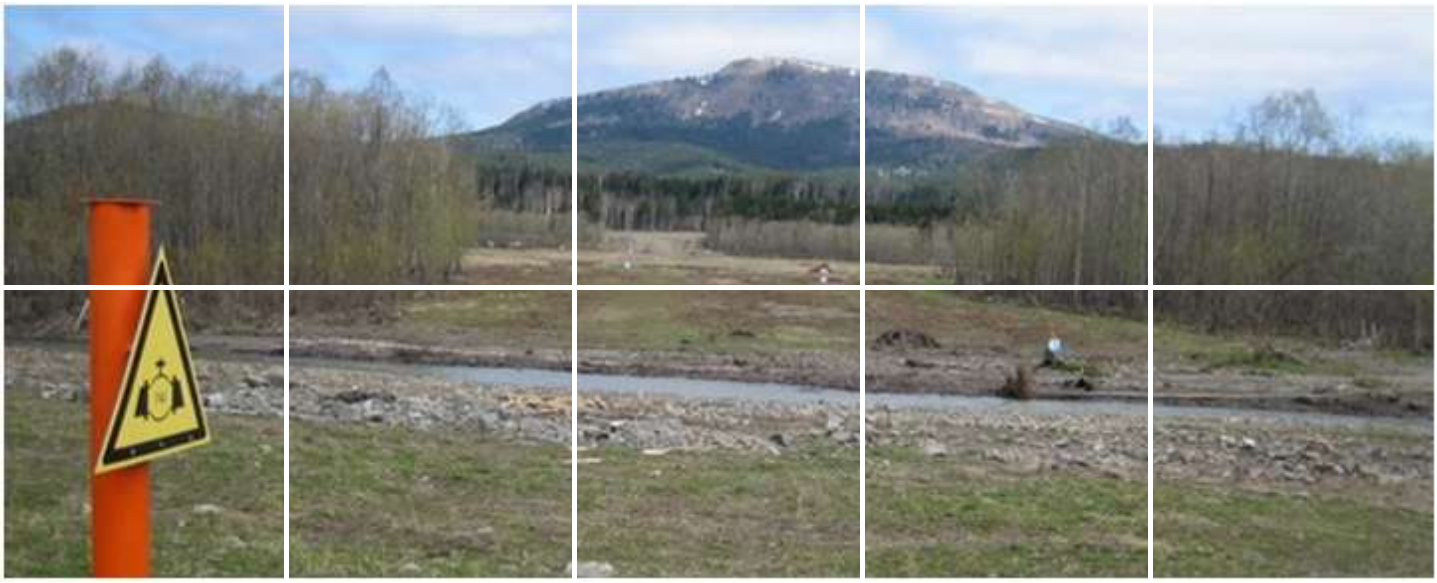

Lenders' Independent Environmental Consultant:

Monitoring Report June 2010

Sakhalin-2 Phase 2 Project

Report to Sakhalin-2 (Phase 2) Project Finance Parties

Restricted – Commercial
AEAT/ENV/R/3052 Issue 1
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List of Abbreviations

AEA	AEA Technology plc, Independent Environmental Consultant
BETS	BETS B.V. (Bechtel/Enka/Technostroyexport) – OPF construction contractors
BVS	Block Valve Station
CMT	Crisis Management Team
ECT	Emergency Co-ordination Team
FOC	Fibre-optic cable
GTT	Gazprom Transgaz Tomsk
HSESAP	Health, Safety, Environmental and Social Action Plan
IEC	Independent Environmental Consultant
LNG	Liquefied Natural Gas
MOU	Memorandum of Understanding
OPF	Onshore Processing Facility
OSR	Oil Spill Response
OSRP	Oil Spill Response Plan
RF	Russian Federation
RoW	Right of Way
Sakhalin Energy	Sakhalin Energy Investment Company Ltd
SPZ	Sanitary Protection Zone
TLU	Tanker Loading Unit
WRC	Wildlife Rehabilitation Centre

Executive Summary

AEA Technology (AEA) is the Independent Environmental Consultant (IEC) acting on behalf of the Senior Lenders to the Sakhalin-2 Phase 2 project. Under the Terms of Reference of our engagement, AEA and Lender representatives undertake periodic monitoring visits to the Project.

Two major environmental monitoring visits were undertaken by AEA on behalf of the Lenders during the period April-June 2010. The first, undertaken in April 2010, covered the Project's three main onshore facilities and landfills. The second, undertaken from 2nd to 10th June 2010, assessed targeted locations along the pipeline Right of Way (RoW) including river crossings and slopes identified as a result of previous Lender visits, those having undergone recent major engineering work, and those of current Lender concern. This visit was undertaken later in the year to wait for snow melt on the island. However, some locations remained inaccessible as a result of high river flows from the spring thaw.

This report presents the findings of the second environmental monitoring visit to the pipeline Right of Way. A comprehensive list of RoW locations visited during June 2010 plus detailed comments and descriptions are provided in Appendix 1. This report also presents the resolution of closed items, progress made, if any, against outstanding items, and new issues identified as a result of this monitoring visit; this updates the Findings Log presented in the April 2010 monitoring visit report.

In summary, AEA found that technical reinstatement of the RoW is generally sound and well managed by Sakhalin Energy, including effective response to the 2009 typhoon damage and ongoing inspection and corrective engineering works. However, in some areas, biological reinstatement has deteriorated over the last two years, and it is recommended that Sakhalin Energy adopts a more proactive and robust system for ground cover maintenance. New and open Findings remain in relation to Dolinsk wetlands temporary road/debris removal, RoW biological reinstatement, temporary bridge removal and/or permanent bridge upgrade, construction camp decommissioning, river and wetland environmental monitoring/sampling programmes, and block valve station diesel day tank drip trays. Progress towards the resolution of these Findings will be included in the IEC's monitoring reports going forward.

Large-Scale Engineering
Typhoons during 2009 caused substantial damage to riverbank protection at a number of high-energy rivers. Sakhalin Energy mobilised several crews during the later part of 2009 and early 2010 to perform emergency repair work at 14 named rivers (10 of which are classified as Group III – highest ecological sensitivity) and a number of unnamed streams. AEA was able to observe eight locations where large scale engineering and repair measures were performed. Very large riprap, Reno mats and gabion walls were observed to good effect at several locations, fortifying riverbanks in and upstream of the crossing and stabilising steep side cuts. Other sites where the engineering works had not had to be re-visited for repairs to typhoon damage were also observed and the engineered structures were seen to be holding well. We understand that Sakhalin Energy is developing a further programme of repair and maintenance works for the remainder of the year and using external specialist design consultants to modify the river crossing protection at some locations.

Erosion Control and Drainage
Most of the slopes observed during the visit were protected with slope breakers, and for the most part these were performing well. However, there were some instances in which slope breakers were constructed with too steep an angle causing rill development, or with an inconsistent gradient causing overtopping and sometimes failure of the slope breaker. In some cases, too few slope breakers had been installed for the conditions, resulting in soil erosion. It is recommended that during future repairs and other maintenance activities on slopes, more emphasis is placed on proper slope breaker construction where problems are observed.

During construction, Sakhalin Energy used geojute and coco matting extensively on steep slopes with highly unconsolidated soils, and to fortify slope breakers. Mostly, the application of these materials has been successful in reducing erosion and providing better germination conditions for seeds. Geotextile matting has also been used successfully in places in conjunction with hydro-seeding.

Riprap lining drainage channels was in good condition, and in many places the original riprap laid during construction was still in place with good vegetation cover growing through.

Sakhalin Energy also used silt fencing extensively and effectively to control sediment during construction. Some locations still have the silt fences in place and they continue to function well. In other locations, the fences are damaged from storms and from occasional theft of the textile. AEA recommends that Sakhalin Energy evaluates the need to replace and/or upgrade the fences on a site by site basis. It is clear that some locations do not require the protection any longer.

Biological Reinstatement
This RoW visit took place following a long winter with the main snow-melt occurring only a week before and some snow still lying on the higher ground in the north. As a result, any grass growth on the RoW was not very advanced and assessment had to be made on the basis of observation of new shoots and areas where there was no growth showing at all. However it was clear that in some areas, biological reinstatement has deteriorated over the last two years, partly due to the lack of retention of topsoil at the start of construction activities and partly due to a lack of aftercare following the initial seeding work. It is recommended that Sakhalin Energy adopts a more proactive and robust system for ground maintenance over and above their current RoW engineering maintenance. This should include items such as re-seeding in areas where the growth is patchy, on-going fertilisation of areas where the growing medium is thin and consideration of alternative seed stocks to introduce indigenous plants or more robust species such as clover where grass is apparently unsuccessful.

In the sandy areas, where there is a majority of barren stretches of RoW, alternatives need to be explored to re-introduce active plant growth since hydro-seeding in isolation has not resulted in a long-term solution. It is likely that several years of work, revisiting the areas every growing season, will be required before the slopes become self-sustaining.

Monitoring of Re-Engineering Works
Sakhalin Energy updated AEA on its maintenance works classification system, outlining the where the responsibilities currently lay for varying categories of pipeline maintenance works. Slope failures noted by AEA during this visit will reportedly be added to the maintenance schedule.

River banks are also evaluated under the monitoring and maintenance schedule. The Company has already made significant riverbank stabilisation works upstream of the RoW (reportedly under licence) on several rivers during the emergency repair works of late 2009 – early 2010. Sakhalin Energy is currently evaluating each of the high risk rivers and preparing a plan as to how best protect the channel. Specialist design consultants are available to assist with geotechnical issues including riverbank and slope stability. AEA notes that from an environmental point of view, the timing of the work (avoiding spawning and nesting periods) and the use of silt fences, particularly in areas of poor vegetation, to reduce siltation in the river must be considered when planning and undertaking these works. Also, we further recommend that all rivers that have been significantly disturbed are sampled for an appropriate amount of time to ensure recovery of the river – we understand that the Water Permit requires monitoring after the construction period of in-river engineering work but would like to see further monitoring, for example, if continued increased suspended solids are noted.

RoW Video Footage
During the visit, the RoW video footage taken from a helicopter flyover on 31st May 2010 was briefly viewed by members of the AEA team. In general, the footage was considered to lack the quality of definition required for a detailed survey of the RoW (moderately major slope failures noted on the ground were not clear on the video), although it did provide a useful overview of the biological condition (parts showing good growth, barren sections etc, bearing in mind that June is still early in the growing season). In the future, Sakhalin Energy should consider the helicopter flying position and seasonal timing of the video run, depending on what purpose it is hoped to achieve.

General
Housekeeping on the RoW requires a little attention, removing old silt fences and surplus construction supplies and debris after use. In addition, much of the RoW signage was missing, particularly around the federal/public access roads. As these signs show emergency contact information, AEA encourages Sakhalin Energy to replace these signs, securing them more firmly to the posts and perhaps using a sign shape not as conducive for use as snow shovels, or writing the emergency information on the posts themselves.

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Appendices

1 Introduction

AEA Technology (AEA) is the Independent Environmental Consultant (IEC) acting on behalf of the Senior Lenders to the Sakhalin-2 Phase 2 project (the 'Project'). Under the Terms of Reference of our engagement, AEA and Lender representatives undertake periodic monitoring visits to the Project. AEA has undertaken extensive field monitoring in Sakhalin since 2003 with the two most recent monitoring visits focussing on the Right of Way (RoW) being undertaken in May 2009 and September 2009. Monitoring reports from 2007 onwards are available from the Sakhalin Energy website[1].

Two major environmental monitoring visits were undertaken by AEA on behalf of the Lenders during the period April-June 2010. The first, undertaken in April 2010, covered the Project's three main onshore facilities (Onshore Processing Facility, Booster Station 2 and the LNG plant) and landfills (Nogliki, Smirnykh, Makarov and Korsakov). A report[2] has already been produced regarding these facilities and landfills. The second, undertaken from 2nd to 10th June 2010, assessed targeted locations along the pipeline Right of Way (RoW), where accessible. This included river crossings and slopes identified as a result of previous Lender visits, those having undergone recent major engineering work, and those of current Lender concern. This visit was undertaken later in the year to wait for the snow melt across the island. However, some locations remained inaccessible as a result of high river flows from the spring thaw.

This report presents the findings of the second environmental monitoring visit to the pipeline Right of Way. A comprehensive list of RoW locations visited during June 2010 plus detailed comments and descriptions are provided in Appendix 1. This report also presents the resolution of closed items, progress made, if any, against outstanding items, and new issues identified as a result of this monitoring visit. This updates the Findings Log presented in the April 2010 monitoring visit report.

[1] http://www.sakhalinenergy.com/en/library.asp?p=lib_3rdparty_shelf&l=lib_3rdparty_lendersreport
[2] Lenders' Independent Environmental Consultant: Monitoring Report April 2010, AEA report number AEAT/ENV/R/3042 (under review at time of writing)

2 Large Scale Engineering

Typhoons during the later part of 2009 caused substantial damage to riverbank protection at a number of high energy rivers. Sakhalin Energy mobilised several crews to perform emergency repair work at the earliest opportunity. With the exception of the Gornaya River, for which emergency works were carried out immediately (July 2009) to safeguard pipeline integrity and restore spawning habitat, the works started in early November 2009 and ended in April 2010.

Reportedly, emergency repairs were required on 14 named rivers, 10 of which are classified as Group III Rivers, two are Group II Rivers and two are Group I Rivers. In addition, 12 other streams sustained damage which required emergency repair work. A summary of the locations and Group type is presented in Table 1 below.

Table 1 Emergency Repair Works - November 2009 to April 2010[3]

Emergency Repair Works					
KP	River Name	River Classification (Group)	Work Priority	Work Status	Work Date
243.0	Seredka	I	1	Complete	20 Nov – 7 Dec 2009
272.0	Zamyslovataya	III	1	Complete	8 Dec 2009 – 15 Jan 2010
274.6	Leonidovka	III	1 - 2	Complete	16 Jan – 15 Apr 2010
297.2	Gastellovka	III	2	Complete	21 Feb – 20 Mar 2010
322.5	Chuliymka	II	2	Complete	20 Feb – 15 Mar 2010
327.0	Nitui	III	1	Complete	25 Jan – 15 Apr 2010
335.7	Markovka	III	2	Complete	1 – 28 Feb 2010
344.2	Gornaya	III	1	Complete	16 Dec 2009 – 31 Jan 2010
348.8	Gar	II	2	Complete	15 Jan – 19 Feb 2010
353.9	Stream		2	Complete	5 – 14 Jan 2010
354.2	Stream		2	Complete	26 Dec 2009 – 4 Jan 2010
354.9	Stream		2	Complete	16 – 25 Dec 2009
361.5	Solyanka	I	1	Complete	13 Nov – 15 Dec 2009
362.4	Stream		1	Complete	1 – 8 Dec 2009
362.7	Stream		1	Complete	9 – 15 Dec 2009
373.1	Madeira	III	2	Complete	1 – 31 Mar 2010
376.1	Zhelezhnyak	III	2	Complete	5 – 31 Mar 2010
392.8	Stream		2	Complete	11 – 22 Jan 2010
393.0	Stream		1	Complete	23 Jan – 3 Feb 2010
395.1	Stream		2	Complete	4 – 15 Feb 2010
398.0	Stream		2	Complete	5 – 28 Feb 2010
421.5	Pugachevka	III	2	Complete	1 – 31 Mar 2010
433.4	Stream		1	Complete	3 – 15 Dec 2009
433.7	Stream		1	Complete	7 Nov – 2 Dec 2009
435.0	Travyanaya	III	2	Complete	16 Dec 2009 – 10 Jan 2010
532 - 538	Streams		2	Unknown	2 Feb – 4 Mar 2010

[3] Information provided by Sakhalin Energy with the exception of River Classification (Group)

During the visit, AEA was able to observe eight of the above locations where large scale engineering and repair measures were performed during the later part of 2009 and early 2010. The repairs included:

- Backfilling of washouts
- Re-shaping of riverbanks
- Fortifying banks with very large riprap
- When necessary, fortifying river meander bands upstream of the pipeline crossing to prevent a washout of the RoW and to keep the river to its course.

Currently, Sakhalin Energy is developing a further programme of repair and maintenance works for the remainder of the year, taking into account working restrictions during the spawning and nesting seasons where applicable. Sakhalin Energy also recognises that river crossing protection in some locations (e.g. the Nitui and Gastellovka rivers) requires modification from the current design. Sakhalin Energy has reportedly contracted the services of qualified design consultants, whose personnel arrived on island in mid June 2010. We understand that special attention will be given to the large braided rivers such as the Nitui, Gastellovka and Leonidovka.

The following sections describe the large scale engineering measures observed in the field. Detailed descriptions and observations at each location are included in Appendix 1 of this report.

2.1 Large Riprap

The use of very large riprap to fortify riverbanks in and upstream of the crossing was observed in several locations including the Pugachevka, Nitui and Gornaya Rivers. Large riprap has been applied to stabilise banks that were partially washed out or otherwise damaged. In some instances the washout was large enough to expose the fibre-optic cable (FOC) and in some cases the pipeline itself. The use of very large riprap is intended to withstand the forces of the high flow / high velocity rivers during storms such as typhoons or during fast spring thaw. Examples of such use can be seen in the Nitui River (Photo 1) and in the Gornaya River (Photo 2).

Note: The use of regular size riprap is described in Section 3, Erosion Control and Drainage.

2.2 Reno Mats and Gabion Walls

Reno mats and gabion walls are very useful methods for stabilising riverbanks of rivers with seasonal high flow and high velocity waters. Sakhalin Energy has applied this method successfully to many river crossings such as the Madera River (Photo 3) and the Lazovaya 2 River (Photo 4).

In addition, gabion walls are used to stabilise steep side cuts by providing a buttress made of a multi level gabion wall and packed earth. This method was successfully used in several locations such as the side cut near the Nizhni Kamishovka River (Photo 5) and Fault Crossing 9 and 10 (Photo 6). When the use of Reno mats and gabion walls started, Sakhalin Energy needed to import expertise from a specialist company from mainland Russia. However, this expertise is now available on Sakhalin Island and no longer needs to be imported.

Photo 1 Nitui River - KP 326.6 – View of large riprap on opposite bank

Photo 2 Upstream meander band of the Gornaya River – KP 344

Photo 3 View of gabion wall on the Madera River - KP 373

Photo 4 View of gabion walls on the banks of the Lazovaya 2 River crossing – KP 384.5

Photo 5 Side cut buttressed by a multi level gabion wall and soil backfill – KP 490.3

Photo 6 Side cut buttressed by a multi level gabion wall and soil backfill – KP 304

3 Erosion Control and Drainage

During construction, Sakhalin Energy used a variety of erosion and drainage control measures on the RoW. Slope breakers were used to minimise the impact of rain water and snow melt run-off on steep slopes. Geojute, geotextile and internal drains are used to stabilise barren slopes with unconsolidated soils, or slopes with excessive moisture. Riprap is used for stabilising riverbanks following a river crossing, and silt fencing to reduce siltation from slopes into rivers and streams. Biological control includes bio-restoration efforts such seeding and hydro-seeding; this is described in Section 4.

Each of these measures is further described in more detail below.

3.1 Slope Breakers

Slope breakers are an important component in managing slope drainage and erosion control. Most of the slopes observed during the visit were protected with slope breakers. For the most part, the slope breakers that were observed were performing well (Photo 7). However, there were instances in which slope breakers were constructed with too steep an angle causing rill development, or with an inconsistent gradient causing overtopping and sometimes failure of the slope breaker (Photo 8). The frequency of slope breakers on a slope is another critical aspect in their performance. More are needed as the slope gradient increases and/or the soil is less cohesive.

It was observed during the visit that there were some cases where too few slope breakers were installed for the conditions, resulting in soil erosion (Photo 9). It is recommended that during future repairs and other maintenance activities on slopes, more emphasis is placed on proper slope breaker construction.

3.2 Geojute and Coco Matting

Geojute matting (made of jute fibre) and coco matting (made of coconut fibre) are an inexpensive but effective erosion control measure. When installed correctly, these materials assist in stabilising un-vegetated soil while providing better germination conditions for seeds and assisting in establishment of vegetation. These materials are also bio-degradable. Sakhalin Energy has used geojute and coco matting extensively on steep slopes and slopes with highly unconsolidated soils (Photo 10 and with geotextile in Photo 11). In addition, the material was used to fortify slope breakers. Mostly, the application of these materials was successful in reducing erosion and providing better germination conditions for seeds.

3.3 Geotextile

Geotextile matting (made of synthetic filaments) is a very effective way to control erosion on barren steep slopes and slopes with poorly consolidated soils. Sakhalin Energy has used this material extensively on side cuts at most of the fault crossings (Photo 12) and on slopes with high risk of erosion (Photo 11). In places this was done successfully in conjunction with hydro-seeding.

3.4 Riprap

Riprap is an assemblage of lose rock/stones used to stabilise river banks and drainage channels. The size of the rocks used is relative to the flow energy in the river or channel. Sakhalin Energy used riprap as a temporary bank protection during construction to stabilise a river bank following a crossing. Riprap was also used as an erosion control measure to line drainage channels on steep slopes and as an energy dissipater at the termination point of drainage channels and internal drains. During the visit, riprap was observed in drainage channels and as an energy dissipater at numerous locations (Photo 13 and Photo 14). In addition it was observed that on some low energy stream and rivers, the originally placed riprap is still in place and in some locations with good vegetation cover growing through the riprap layer.

3.5 Silt Fencing

Silt fencing is an effective method of protecting rivers and streams from sediment influx from slopes above the banks, and reducing siltation from temporary road works and bridges during construction. A silt fence is a low (approximately 50 cm in height) barrier made of a specialty synthetic weave. It is designed as a silty/sandy water filter, allowing water to pass through but not the sediment, and not as a structural barrier for sediment movement. By its nature, silt fencing is temporary and is used as protective barrier to siltation for as long as the slopes above the banks are without vegetation. In most cases, once the vegetation is re-established the silt fencing is no longer necessary.

Sakhalin Energy used silt fencing extensively and effectively during construction. Some locations still have the silt fences in place and they continue to function well (Photo 15). In other locations, the fences are damaged from storms and from occasional theft of the textile (Photo 16). AEA recommends that Sakhalin Energy evaluates the need to replace and/or upgrade the fences on a site by site basis. It is clear that some locations do not require the protection any longer.

3.6 Internal Drains

Internal drains are subsurface drainage channels made of perforated pipe and gravel. These are essential in situation where the slope sediment is saturated due to an in-situ water source such as a spring and which cannot be stopped. The drain then is used to safely divert the water off the RoW and to dry the sediment on the slope, thereby stabilising the slope. Examples of successful internal drains observed during the visit are on the north slope of the Krinka River and the Sovetskoye Ridge.

Photo 7 Well constructed slope breakers on the Vulkanka River Slopes

Photo 8 Over-topping of slope breaker near Orkunie River

Photo 9 Slope on Korsakov River showing soil erosion between slope breakers

Photo 10 Geo-jute and seeding (2008) – sandy slopes KP125

Photo 11 Geojute and Geotextile (Enkemat) on the sandy slopes KP 512

Photo 12 Partially successful use of Geotextile (Enkemat) side cuts at Fault Crossing KP 304

Photo 13 KP56 Svetye Stream Riprap

Photo 14 KP 434.9 slope on tributary to the Travyanaya River – use of riprap to line a drainage channel

Photo 15 KP 510.4 Silt fence on the Podgorodnaya River

Photo 16 KP15 Failed silt fencing

4 Biological Reinstatement

Biological re-instatement along the RoW was initially begun on a large-scale in 2007, and carried on through the growing season of 2008 following small-scale trials in 2005 and 2006 on selected river crossings.

In September 2008, an IEC audit of the bio-remediation progress was carried out and found that the work was proceeding well through a mixture of hydro-seeding (Photo 17) and hand seeding of the more remote areas of the RoW. At the time, the grass growth was observed to be vigorous (Photo 18 and Photo 19) due in the main to the inclusion of a fertiliser in the hydro-seed mix. Discussions between AEA and the construction re-instatement team during the September 2008 visit highlighted the need for on-going work, further seeding and fertilisation over the next few growing seasons in order to generate a new organic-rich, self-sustaining growing medium and to aid topsoil development.

Photo 17 Hydro-seeding operation, 2008

Photo 18 Lush grass growth at block valve station (BVS), 2008

Photo 19 Grass growth on RoW, 2008

The RoW visit in June 2010 took place following a long winter with the main snow-melt occurring only a week before and some snow still lying on the higher ground in the north. This meant that any grass growth on the RoW was not very advanced and assessment had to be made on the basis of observation of new shoots and areas where there was no growth showing at all.

In general the RoW can be split into the following areas with regard to the biological re-instatement effectiveness:

- River banks
- Low-lying wetland
- Low-lying flat
- Sandy areas
- Lower slopes
- Upper slopes and hill-tops

4.1 River Banks

Many of the river crossings have engineering works associated with the completion – riprap, Reno mats or gabions. River flood events following the snow-melt have resulted in silt and sand sediments being deposited in varying amounts along the protected river banks. This provides a good growing medium and is resulting in natural re-vegetation in many places, which will in turn provide greater bank stability (Photo 20 and Photo 21). Generally the river banks are showing good signs of recovery.

4.2 Low-lying Wetland

The wetland areas and river flood plains are naturally kept moist through local hydrological processes and have relatively high natural organic content. The result of this is to encourage growth both of any grasses sown as part of the reinstatement and natural re-vegetation of indigenous species (Photo 22 and Photo 23). The wetland areas in particular are showing good recovery of vegetation and the re-establishment of many native species. Sakhalin Energy is aware of the running track materials left in-situ in the Dolinsk wetlands and is currently in the process of having these removed. Due to the sensitive nature of the area, all work is being undertaken manually in order to minimise damage to the RoW.

4.3 Low-lying Flat

There are many areas of the RoW away from the rivers that are still low-lying – these tend to be drier and more variable in the nature of the soil than the wetland areas. The result of this is a more patchy vegetation take with some areas having good coverage (Photo 24) and others being virtually barren (Photo 25). Some work is required over the next few growing seasons to improve vegetation cover; where the coverage is already reasonable this will take the form of the addition of a suitable fertiliser in order to promote future growth and encourage the development of the root mass. Where the seeding has not taken so well, there will be a need to re-seed and fertilise and put in place a long-term maintenance ground-works programme. Hydro-seeding may need to be considered in areas where the soil cover is minimal and initial root propagation requires some encouragement. Further consideration is also required with regard to the choices of seed stock as it is evident that grass seed is not necessarily the most appropriate species for certain areas of the RoW, particularly in the north of the island. The availability of indigenous plant seeds or clovers should be explored.

4.4 Sandy Areas

There are many kilometres of RoW that are predominantly composed of sand with little or no topsoil cover – this is particularly apparent north of Nogliki and an area in the former construction Spread 2 around KP 125. There are several other parts of the RoW where the underlying geology has resulted in a mainly sandy soil at surface. The majority of these stretches have no vegetation or poor vegetation cover as the result of there being no suitable soil growing medium present (Photo 26 and Photo 27). This is resulting in silt and sand run-off from the RoW and the development of erosion features (Photo 28) affecting the long-term viability of these areas.

During the construction period, a lot of work was put in to stabilise the sandy areas and to encourage growth – coco matting, enhanced drainage and hydro-seeding all being used to initial good effect

(Photo 29). However, it would appear that certain elements of the long-term maintenance such as on-going fertilisation and silt trap cleaning, have not been rigorously enforced. This has the result that vegetation growth is poor or non-existent in some areas and the benefit of the root system fixing the soils in place is not being achieved (Photo 30). These areas now require complete renovation with new drainage systems being put in place, the installation of silt fencing and silt traps for short-term run-off prevention, renewal of the coco matting in sensitive areas, re-seeding (potentially hydro-seeding to enhance early growth) and long-term fertilisation over a few growing seasons to encourage the development of root mat. As stated before, consideration needs to be given to the type of seed stock used to enhance the chances of success in these areas.

4.5 Lower Slopes

The lower slopes of the hills along the RoW, in particular those with a southern aspect, are generally showing good re-vegetation, possibly due to moisture run-off down the slopes and the associated increased nutrition load (Photo 31). In places these slopes still require some further nutrition addition to encourage further growth (Photo 32) and in some areas there will be limited re-seeding to be carried out. However in general, these are in good condition and should require minimal, but continued, maintenance.

4.6 Upper Slopes and Hill-tops

Over many parts of the RoW it was apparent that the re-vegetation of the hill-tops had not been as successful as that lower down the slopes. This graduation can be seen in Photo 32. As a result, Sakhalin Energy is having to carry out work in maintaining the slope engineering, slope breakers drainage etc. which is holding the main slope stability well (Photo 33 and Photo 34) but is still resulting in shallow failures and run-off. Further work is required to encourage vegetation growth on these slopes with extensive re-seeding and fertilisation needed. Some slopes would benefit from hydro-seeding initially, with follow up fertilisation at the start of the growing season for a few years until the root mat is established.

4.7 Conclusions and Recommendations

In some areas, biological reinstatement has deteriorated over the last two years, partly due to the lack of retention of topsoil at the start of construction activities and partly due to a lack of aftercare following the initial seeding work. It is recommended that Sakhalin Energy adopts a more proactive and robust system for ground maintenance over and above their current RoW engineering maintenance. This should include items such as re-seeding in areas where the growth is patchy, on-going fertilisation of areas where the growing medium is thin and consideration of alternative seed stocks to introduce indigenous plants or more robust species such as clover where grass is apparently unsuccessful.

In the sandy areas, where there is a majority of barren stretches of RoW, alternatives need to be explored to re-introduce active plant growth since hydro-seeding in isolation has not resulted in a long-term solution. It is likely that several years of work, revisiting the areas every growing season, will be required before the slopes become self-sustaining.

Photo 20 Silting and Re-vegetation of Onor River, 2010

Photo 21 Silting and Re-vegetation of the Dagi River

Photo 22 Natural re-vegetation at Dolinsk

Photo 23 Vegetation at Madera River

Photo 24 Good vegetation on RoW to Vulkanka River

Photo 25 Sparse vegetation on approach to Taulyanka River

Photo 26 Lack of soil cover on sandy RoW

Photo 27 Sandy slopes showing barren and sparse vegetation areas

Photo 28 Erosion features in sandy RoW

Photo 29 Sandy slopes 2008 with drainage, coco matting and grass growth

Photo 30 Sandy slopes 2010 – coco matting on slopes gone and seed stock not in evidence, no shoots showing

Photo 31 Well vegetated lower slope, Podgornaya River

Photo 32 Graduation in slope vegetation KP56.6 Svetly Stream

Photo 33 Sparse vegetation on upper slopes, Voskresenka River

Photo 34 Heavy duty engineering works but lack of vegetation, Khormovaya River

5 Monitoring of Re-Engineering Works

5.1 Engineering

5.1.1 System of Graded Works – Categories 1, 2 and 3

In addition to the follow up work on various rivers, Sakhalin Energy is also documenting and classifying all maintenance work of the RoW as a whole into three categories. The documentation process is a combination of RoW inspections by the pipeline operating contractor Gazprom Transgaz Tomsk (GTT) and spot checks by Sakhalin Energy personnel. Reportedly, GTT inspections are performed both on foot and by bi-weekly helicopter flights, with pipeline personnel making direct observations from the air.

Findings are assigned a Category between 1 and 3. Normal maintenance work is assigned as Category 1, which is dealt with entirely by GTT. Category 2 findings require repairs of a more serious nature and are currently controlled by Sakhalin Energy but scheduled to be handed over to GTT in due course. Category 3 findings include the most serious of problems, and this work currently remains under the control of Sakhalin Energy.

5.1.2 Emergency Repairs

Reportedly, GTT has much experience in repairing pipelines in Siberia. Its pipeline repair manpower is based in Tomsk and Khabarovsk on mainland Russia, and the plant is based at the Gastello PMD. At its bases on the mainland, GTT has specialists in all manner of pipeline repair. These specialist crews can be mobilised at very short notice and personnel are able to arrive on the island within 16 hours. It was explained by the Company that this will not delay repair work since it takes time to mobilise the heavy plant to the site and prepare the job-site for work. Plans are made to conduct an exercise to test this emergency response system.

5.1.3 Slope Stability

Most of the slopes observed during the current visit appear to be holding well, although several slopes and side slopes were observed with some degree of failure. A complete failure was observed on a side slope on the gas pipeline side of the RoW (Photo 35) – this site (KP 387) was noted by Sakhalin Energy personnel and put on the Category 3 list. Other locations included the southern slope on the Lesnaya 3 River crossing (KP 380.6) (Photo 36) and on the southern slope of the Kormovaya River crossing (KP 351) (Photo 37). These three sites and others are described individually in Appendix 1 of this report.

In both of these examples, there was a visible outline of a failure but without the complete movement of the soil to the downhill side. Both of these situations were noted by Sakhalin Energy personnel and were put on the required repair works schedule. Generally the soil movement observed is shallow at present but has the potential to become more deep-seated if not rectified at an early stage.

An important non-engineering aspect of slope stability is the vegetation cover. Barren slopes are at a much higher risk of erosion and failure than vegetated slopes. This subject is discussed in detail in Section 4 of this report.

5.1.4 Riverbank Stability

Riverbanks are continually monitored by Sakhalin Energy as part of the RoW monitoring schedule. Some rivers however are in need of closer monitoring and Sakhalin Energy is formulating a monitoring programme with particular attention paid to weather reports, rainfall and river flow levels, all in an effort to predict potential washout events. It became apparent following the typhoons of 2009 that the condition of the riverbanks at the pipeline crossings and the risks associated with high flow are strongly influenced by the condition of the river channel upstream. Sakhalin Energy has already made significant riverbank stabilisation works upstream of the RoW (reportedly under licence) on several

rivers during the emergency repair works of late 2009 – early 2010. Sakhalin Energy is currently evaluating each of the high risk rivers and preparing a plan as to how best protect the channel. This includes investigation of all possible causes for channel shift during floods, and may require earthworks upstream of the crossing within the appropriate licences. All possible repair and prevention methods will be considered during the investigation.

5.1.5 Use of Qualified Design Consultants for Specific Sites

Sakhalin Energy is retaining qualified design consultants for geotechnical issues which include riverbank and slope stability as discussed above. Sakhalin Energy has in-house geotechnical expertise in "Geomatics" and in addition has retained Royal Haskoning Inc. Haskoning representatives were reportedly arriving on the island in mid-June.

5.2 Environmental

5.2.1 Timing of work – Spawning and Nesting Seasons

Repair works which are scheduled to be performed this year are restricted in scheduling by the salmon spawning dates and by nesting of Steller's Sea Eagle and other ground nesting birds. Work schedule will be performed according to the specific licence restriction for work at each individual location.

5.2.2 Silt control

The majority of silt control is currently undertaken using silt fencing. Ultimately, the best silt control is performed by well vegetated slopes and riverbanks. In some locations the vegetation is well established and precludes future use of silt fencing. In other areas the existing silt fences perform an important part in reducing siltation in the river. It is recommended that Sakhalin Energy makes site specific decisions whether or not to continue with the repair and maintenance of fences, or to discontinue their use. Where new repairs are conducted on riverbanks and slopes it is advisable to install silt fencing after the work is concluded.

Silt fencing will also be useful in sandy slope areas where there is significant run-off away from the right of way. In these areas it will have to be used in conjunction with silt traps that will require regular monitoring and cleaning out until such time as the vegetation is sufficiently established to prevent fine soil movement.

5.2.3 River Monitoring (Sampling)

Sakhalin Energy is monitoring (sampling) sensitive rivers under the provisions of the Environmental Monitoring Programme (EMP Vol. 3, Section 3.12.1 *Monitoring of Surface natural Water and Bed Loads*). The monitoring of selected watercourses is carried out twice per year as per comprehensive monitoring programme 1 or abbreviated monitoring programme 2 (Table 3.12.1). The programme depends on the size of the spawning areas downstream of the pipeline crossing and erosion development potential.

Only five rivers disturbed during the late-2009/early-2010 major repair works are under this monitoring obligation: Zamyslovataya, Leonidovka, Gastellovka, Nitui and Gornaya Rivers. However, AEA recommends that all sensitive rivers that were disturbed by the recent emergency repairs be added to this (or a similar) monitoring programme. AEA understands and recognises that river monitoring is required by the Water Permit, to be undertaken after the construction period of in-river engineering work, however we recommend that further monitoring is considered depending on the outcome of this monitoring, for example if continued increased suspended solids are noted.

We further recommend that in the future, all sensitive rivers that undergo channel/riverbank works should be monitored as a matter of course, as part of a similar programme for an appropriate length of time.

Photo 35 Slope failure at the northern slope leading to the Sedlet River KP 387

Photo 36 A start of a failure on the southern slope of the Lesnaya 3 River KP 380.6

Photo 37 A start of failure at the southern slope of Kormovaya River – KP 351

6 Right of Way Video Footage

During the visit, the RoW video footage taken from a helicopter flyover on 31st May 2010, was briefly viewed by members of the AEA team. The video was shot at an oblique angle to one side of the RoW with an elevation of some 200m. It is not felt to be appropriate to provide a commentary on specifics in this report but the following observations can be made:

1. The 2010 video lacks the quality of definition to be useful for a detailed survey of the RoW, but does give a useful overview. It was noted that features observed on the ground during the site visit were not clear on the video. Examples of this are the slope failures at Sedlet and Khomovaya where moderately major features on the ground could not be defined from the video footage (Photo 38 and Photo 39).

2. As an overview of areas of biological reinstatement, the video was useful as it was clear which parts of the RoW were showing good growth and which were barren (Photo 40).

3. Should Sakhalin Energy wishes to continue the video flyover, it needs to consider the main purpose it is trying to achieve:

    a. If the fly-over is undertaken for checking on areas that require further biological re-instatement, the distance from the RoW adopted for the 2010 exercise is suitable, but consideration should be given to timing the flight to coincide with the height of the growing season in August / September.

    b. If the flight is to assess the physical condition of the RoW and check for engineering works that maybe required, then the flight timing is good being as close to the snow-melt as possible. However, the distance of the flight from the RoW needs to be greatly reduced, the angle of the camera brought more overhead to cut out the oblique angle and the quality of footage improved with high resolution digital being used if available. The original video footage taken in 2008 as the construction teams were assessing the work required to re-instate some areas is a good example of a close-up survey that would have more use in the assessment of the physical properties of the RoW.

Photo 38 Video still and on-site photo of Khormovaya River Slope failure

Photo 39 Video still and on-site photo of Sedlet River Slope failure

Photo 40 Bauri River showing good vegetation to the left and no vegetation to the right

7 General Right of Way Maintenance

7.1 Housekeeping

At a few locations particularly in the north of the island (e.g. Plelyarna River), AEA noted that silt fencing deemed no longer required had been discarded at the edge of the RoW. As a matter of good housekeeping, such construction debris must be collected from site and disposed of appropriately, recycling wooden stakes and textile where possible.

Surplus construction materials also remain at sites having recently undergone engineering works. For example, pieces of large riprap were noted by the stream near the Leonidovka River. Sakhalin Energy has acknowledged that this requires removal, and AEA recommends that this is undertaken prior to this coming winter.

7.2 RoW Signage

The RoW is crossed by a number of federal and public access roads, and unauthorised use of the RoW is obvious in many locations. As a result, a large proportion of the RoW signage and KP marker posts have been removed by locals, and thought to be put to personal use as snow shovels and similar.

While we recognise that theft of signage is somewhat inevitable, these signs do display the telephone numbers to call in case of emergencies associated with the pipeline. For this reason, AEA encourages Sakhalin Energy to replace missing signage, securing it more firmly to the posts, perhaps by welding rather than screwing them on, using a sign shape not as conducive for use as snow shovels, or alternatively considering printing the emergency information on the posts themselves.

8 Summary and Conclusions

In summary, AEA found that technical reinstatement of the RoW is generally sound and well managed by Sakhalin Energy, including effective response to the 2009 typhoon damage and ongoing inspection and corrective engineering works. However, in some areas, biological reinstatement has deteriorated over the last two years, and it is recommended that Sakhalin Energy adopts a more proactive and robust system for ground cover maintenance. Our main points are summarised below:

Large-Scale Engineering
Typhoons during 2009 caused substantial damage to riverbank protection at a number of high-energy rivers. Emergency repair was undertaken during late 2009 / early 2010 at 14 named rivers (including 10 Group III rivers) and a number of unnamed streams. Very large riprap, Reno mats and gabion walls were observed to good effect at several locations, fortifying riverbanks in and upstream of the crossing and stabilising steep side cuts. Other sites where the engineering works had not needed to be re-visited for repairs to typhoon damage were also observed and the engineered structures were seen to be holding well. We understand that Sakhalin Energy is developing a further programme of repair and maintenance works for the remainder of the year and using external specialist design consultants to modify the river crossing protection at some locations.

Erosion Control and Drainage
Most of the slopes observed during the visit were protected with slope breakers, and for the most part these were performing well. However, there were some instances in which slope breakers were constructed with too steep an angle causing rill development, or with an inconsistent gradient causing overtopping and sometimes failure of the slope breaker. In some cases, too few slope breakers had been installed for the conditions, resulting in soil erosion. It is recommended that during future repairs and other maintenance activities on slopes, more emphasis is placed on proper slope breaker construction where problems are observed.

Mostly, the application of geojute and coco matting has been successful in reducing erosion and providing better germination conditions for seeds. Geotextile matting has also been used successfully in places in conjunction with hydro-seeding. Riprap lining drainage channels was in good condition, and in many places the original riprap laid during construction was still in place with good vegetation cover growing through. Some locations still have the silt fences in place and they continue to function well. In other locations, the fences are damaged from storms and from occasional theft of the textile. Additional silt fences (in conjunction with silt traps) should be considered in sandy slope areas where there is little vegetation and significant run-off from the RoW. AEA recommends that Sakhalin Energy evaluates the need to replace and/or upgrade the fences on a site by site basis, as it is clear that some locations do not require the protection any longer.

Biological Reinstatement
This RoW visit took place following a long winter with the main snow-melt occurring only a week before and some snow still lying on the higher ground in the north. As a result, any grass growth on the RoW was not very advanced and assessment had to be made on the basis of observation of new shoots and areas where there was no growth showing at all. However it was clear that in some areas, biological reinstatement has deteriorated over the last two years, partly due to the lack of retention of topsoil at the start of construction activities and partly due to a lack of aftercare following the initial seeding work. It is recommended that Sakhalin Energy adopts a more proactive and robust system for ground maintenance over and above their current RoW engineering maintenance. This should include items such as re-seeding in areas where the growth is patchy, on-going fertilisation of areas where the growing medium is thin and consideration of alternative seed stocks to introduce indigenous plants or more robust species such as clover where grass is apparently unsuccessful.

In the sandy areas, where there is a majority of barren stretches of RoW, alternatives need to be explored to re-introduce active plant growth since hydro-seeding in isolation has not resulted in a long-term solution. It is likely that several years of work, revisiting the areas every growing season, will be required before the slopes become self-sustaining.

Monitoring of Re-Engineering Works
Sakhalin Energy updated AEA on its maintenance works classification system, outlining the where the responsibilities currently lay for varying categories of pipeline maintenance works. Slope failures noted by AEA during this visit will reportedly be added to the maintenance schedule.

River banks are also evaluated under the monitoring and maintenance schedule. The Company has already made significant riverbank stabilisation works upstream of the RoW (reportedly under licence) on several rivers during the emergency repair works of late 2009 – early 2010. Sakhalin Energy is currently evaluating each of the high risk rivers and preparing a plan as to how best protect the channel. Specialist design consultants are available to assist with geotechnical issues including riverbank and slope stability. AEA notes that from an environmental point of view, the timing of the work (avoiding spawning and nesting periods) and the use of silt fences, particularly in areas of poor vegetation, to reduce siltation in the river must be considered when planning and undertaking these works.

Also, we further recommend that all rivers that have been significantly disturbed are sampled for an appropriate amount of time to ensure recovery of the river – we understand that the Water Permit requires monitoring after the construction period of in-river engineering work but would like to see further monitoring, for example, if continued increased suspended solids are noted.

Findings
New and open Findings remain in relation to Dolinsk wetlands temporary road/debris removal, RoW biological reinstatement, temporary bridge removal and/or permanent bridge upgrade, construction camp decommissioning, river and wetland environmental monitoring/sampling programmes, and block valve station diesel day tank drip trays. Progress towards the resolution of these Findings will be included in the IEC's monitoring reports going forward.

9 Findings Log

AEA has previously documented all observations, issues and recommendations arising from its environmental monitoring visits in the subsequent reports. The resolution and/or close-out of these issues have been tracked by AEA and Sakhalin Energy, although not always published.

The IEC's April 2010 monitoring report contained a new section, **Findings Log**, including:

a) All issues not closed out at the date of the previous report plus new Findings identified during that visit;
b) All actions from the Rivers, Erosion and Wetlands Remedial Action Plan (RemAP) 2007 for completeness;
c) HSE Issues[4] raised in regular reports to Lenders since the date of the last report (i.e. from September 2009 to date) and still having open actions;
d) Actions arising from HSESAP revision process.

Much progress has been made to close out many of these outstanding issues, so the list carrying over to this June 2010 monitoring visit report only contains new/open items and is therefore much shorter.

Findings are listed in the **Findings** column, and have been categorised, put into chronological order (by date identified) and given a reference number (AIR.01, AIR.02 etc). Items have also been ranked according to Sakhalin Energy's Methodology[5], and where applicable, a reference to the relevant HSESAP, RemAP or other shareholder commitment has been provided.

The **Action Progress Review** column shows recent progress made towards resolving/closing the outstanding items, and any RemAP status updates.

[4] Note that issues/incidents shall be reported to the Lenders and tracked via regular reports in accordance with the Loan Agreement, and are not separately included in this Findings Log. If a new RemAP is subsequently agreed in relation to any issue/incident, then this will be included in the Findings Log because it includes formally agreed actions. Where a RemAP is not required, the issue/incident should carry over to the next report until its status is shown as closed. Lenders can request additional information on any issue/incident at any time (as per Loan Agreement).
[5] Assessed as per Risk Assessment Matrix

Ref[6]	Rank[7]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
AIR EMISSIONS AND ENERGY MANAGEMENT								
AIR.01	Low Amber	**Open**	Aug 07	Air emissions – community project	HSESAP Revision 2 Table 2.8 item 31, and Project / shareholder agreements	Commitment to reduce CO_2 emissions through the use of gas rather than current fuel supplies on the island. Note: This requires development of infrastructure by the local authorities.	**14.04.10**: Sakhalin Energy actions (e.g. gas transfer terminal) are in progress in accordance with arrangements under the project and shareholder agreements. However, the authorities' project for gas infrastructure provision is currently not in progress. **Action**: Complete and commission the Gas Transfer Terminal South project in support of community gas infrastructure.	XXXXXX[8]
AIR.04	Low Amber	**Open**	Apr 10	Air emissions – SPZ	0000-S-90-04-O-0258-00-E Appendix 1	AEA believes that the Gastello temporary construction camp, still currently occupied by BS2 site personnel, is certainly within the SPZ, and as such is not in compliance with RF law.	**21.06.10**: Sakhalin Energy confirmed that the BS2 Gastello temporary camp is within the SPZ and plans are in place for its demolishment. The plan is to commence demolishment early August 2010 and complete the reinstatement by end October 2010. Works will be carried out by Temp Sakhalin Contractor. BS2 site staff will be accommodated in the Temp Sakhalin Camp located close to the BS2 facilities. **Action**: Demolish BS2 Gastello temporary camp and reinstate the site.	XXXXXX
AIR.05	High Amber	**Open**	Apr 10	Air emissions – flaring at OPF	0000-S-90-04-O-0258-00-E Appendix 1	Operational difficulties with overhead compressors and on-going shutdowns at LUN-A has lead to OPF having used 80% of its permitted 2010 flaring limit during the first quarter of the year. It is expected that the OPF will exceed its flaring allowance and hence emissions limits for 2010.	**21.06.10**: Sakhalin Energy advised that, based on the cumulative flared volume to date and an expectation that both overhead compressors will continue to run without failure, the total flared volume by the end of the year is expected to be 3.0 Bscf, versus RTN limit 3.5 Bscf. The cause of the failure of the machines is still subject to an ongoing investigation with the manufacturer (Hitachi) and a specialist consultancy. Design enhancements have been agreed upon which are currently under manufacture. The plan is to install the enhanced components during 2011. **Action**: Provide monthly updates of cumulative 2010 flaring volume and six-monthly updates on progress towards rectification of overhead compressor and other operational issues.	XXXXXX
AIR.06	Low Amber	**New**	Jun 10	Air emissions – SPZ Solyanka River	0000-S-90-04-O-0257-00-E Appendix 1	A dacha was noted living very close to the pipeline by the Solyanka River. As per RF law, living accommodation is not permitted within an area designated as an SPZ.	**Action**: Advise whether the dacha is within the SPZ for the pipeline, and what actions the Company has taken, if applicable.	XXXXXX

[6] This Findings Log includes all Findings that were open at the date of the previous report (April 2010 in this case), plus newly identified findings.
[7] **Ref**: Finding number. **Rank:** RAM Red/ High Amber/ Low Amber / Green. **Status:** New (Finding raised this visit), Open (Finding from a previous visit), or Closed. **Date:** date of report in which the Finding was initially raised. **HSESAP Ref.:** reference to relevant HSESAP document and requirement number. **Action Progress Review:** new information confirmed at this visit. **Action#:** Fountain database action reference number(s).
[8] Action# will be added by Sakhalin Energy following issue of this report.

Ref[6]	Rank[7]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
WATER USE								
WATER.03	Low Amber	**Open**	Apr 10	Water – effluent quality – phenol	0000-S-90-04-O-0255-00-E Appendix 1	The six most recent monthly compliance checks on process water discharges show significant exceedences of phenol over permitted levels. Part of the problem is that process water is filtered through a single filter rather than the three filter system originally in the plant design. The current system filters total suspended solids but still requires the addition of freshwater to avoid exceeding the hydrocarbon ppm discharge limits. This water is obtained from local surface water sources that are generally from peaty, iron-rich sources which frequently contain naturally occurring phenolic compounds.	**Action**: Install a permanent treatment system able to control suspended solids, hydrocarbons and phenol while not requiring additional dilution to achieve discharge consents. If the phenol source cannot be eliminated Sakhalin Energy needs to consider putting an activated carbon filter in-line to deal with this problem. **Action**: Status of existing issues and concentrations, and any future issues to be reported via monthly/ quarterly reporting as per WATER.02.	XXXXXX
WASTE MANAGEMENT								
WASTE.01	Green	**Open**	Sep 07 (p 235, section 8.3.8)	Waste – oily waste handling	0000-S-90-04-O-0258-00-E Appendix 9	Sakhalin Energy to develop the relevant facility for Oily waste storage. Sakhalin Energy to provide quarterly update on obtaining legal permits on operating the facility.	**23.04.10**: Sakhalin Energy reported that the relevant facility, Smirnykh Oily Waste Holding Area (OWHA), has been developed. Land allocation is an outstanding issue to be resolved by the local administration. A legal permit is required to operate facility thereafter. **Action**: Commission the Smirnykh Oily Waste Holding Area after resolution of the land allocation issue by the local administration.	XXXXXX
WASTE.05	Green	**Open**	Apr 10	Waste – RemAP	0000-S-90-04-O-0258-00-E Appendix 1	Sakhalin Energy reported that physical works for remediation of Val landfill (legacy waste issue) are in progress, and only seeding is pending in Spring 2010.	**Action**: Complete landscaping work at Val landfill (legacy waste issue) followed by inspection and final act of acceptance from Nogliki Administration.	XXXXXX
WASTE.06	Low Amber	**Open**	Apr 10	Waste management	0000-S-90-04-O-0258-00-E Appendix 1	Approximately 540 shipping containers, most of which are 40 feet in length, are located in various open fields at the OPF site. Reportedly, the containers were left by Project contractor BETS and are now the responsibility of Operations. Within the last year the OPF maintenance department has been systematically opening and surveying the containers, and classifying the contents and structural condition of the containers themselves to ascertain what content can be reused at the facility and what needs to be classified as waste and disposed of. To date 540 containers have been examined for lifting integrity and 488 examined for content.	**Action**: Complete examination and inventory of legacy waste containers at OPF. Prepare a plan (with timescales and end-points) for disposal of this waste.	XXXXXX
WASTE.07	High Amber	**Open**	Apr 10	Waste – disposal end points	0000-S-90-04-O-0258-00-E Appendix 1	Sakhalin Energy to identify an end-point for sulphinol-contaminated waste. 1.5 tonnes contaminated sand has been stored at the facility for more than six months.	**Action:** Advise when an environmentally acceptable end-point has been identified for sulphinol-contaminated waste.	XXXXXX

Ref[6]	Rank[7]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
WASTE.08	High Amber	**Open**	Apr 10	Landfills	0000-S-90-04-O-0258-00-E Appendices 5 & 9	A review of the Waste Management Standards Comparison and Approved Waste Diversion and Disposal Facilities specification highlighted that some aspects of landfill engineering at the upgraded Smirnykh, Nogliki and Korsakov landfills might not comply with international standards (i.e. the Landfill Directive). This seemed to conflict with statements within these documents that the upgraded landfills met international standards. Risk Assessment reports for each of these facilities were prepared in 2004 and have been reviewed. The statement of full compliance with the European IPPC Directive (Directive 96/61/EC) and the landfill Directive (Directive 99/31/EC) cannot be justified from the contents of the Risk Assessment reports. It is recommended that Sakhalin Energy clearly confirm and clarify the relevant engineering measures that have been carried out at the upgraded landfills. These should be compared to the requirements of the Landfill Directive. Amendments should then be made to the appropriate parts of the Waste Management Standard, as necessary, to reflect the status of the landfills with respect to international standards.	**Action:** Review the Approved Waste Diversion and Disposal Facilities Specification (0000-S-90-04-O-0258-00-E Appendix 9) to ensure appropriate specification of landfill engineering measures within 12 months following Project Completion.	XXXXXX
WASTE.09	Low Amber	**Open**	Apr 10	Waste – disposal end points	0000-S-90-04-O-0258-00-E Appendix 1	Currently there is no system for the disposal of correlation gas samples sent through as part of the Shell world-wise laboratory assessment.	**Action**: identify a disposal route for correlation gas samples.	XXXXXX
SOIL AND GROUNDWATER								
S&GW.03	High Amber	**Open**	Apr 10	Secondary containment of drums containing fuel, oil and oil-contaminated materials	1000-S-90-04-O-0004-00-E Appendix 5	Drums and other containers containing diesel, new and waste oil, and other oil-contaminated materials were noted to be without secondary containment at many Project facilities and all PMDs. This was of particular concern at Nogliki PMD since spills from the storage area could run directly to unmade ground.	**June 10**: Full OPF site survey identified three drums being stored outside a bunded area – this was immediately rectified. **21.06.10**: A Management of Change has been raised to install self-contained areas at each PMD to store oil. The works target completion date is October 2010. Sakhalin Energy Environmental Manager to visit Nogliki PMD on 22 June to advise on interim groundwater protection measures. **Action:** Provide secondary containment (e.g. drip trays) for drums and other containers to all facilities and PMDs. Provide awareness training to employees to encourage usage of these.	XXXXXX, XXXXXX

Ref[6]	Rank[7]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
S&GW.04	Low Amber	**New**	Jun 10	Secondary containment – 'Day Tanks' at BVS	1000-S-90-04-O-0004-00-E Appendix 5	Diesel day tanks have been observed at some BVS, for example at the Ai River (KP 511.5). These are reportedly necessary for the backup generator since the gas take-off generator is in repair. These require secondary containment. Even if the tanks themselves are double skinned, the ground is unprotected from leaks from the hoses/connectors.	**Action**: Sakhalin Energy to provide secondary containment (e.g. drip trays) for all day tanks currently at BVS.	XXXXXX
LAND MANAGEMENT								
LAND.06	Low Amber	**Open**	Aug 07	Land management – river monitoring	RemAP R2 item	1) Identify the most critical rivers affected by non-compliances during the winter crossing(s) 2) Set up a post-construction monitoring programme (2008) 3) Execute a medium term monitoring programme (2008-2011) 4) Evaluate the results.	**Sep 07**: (AEA Report Table 6-4 Item 6.26) Sakhalin Energy to implement remediation programme if monitoring report identifies any significant impact from the Project. **May 09**: Sakhalin Energy reported river monitoring scope for 2009 completed (May 2009 Monthly Report). **Jul 09**: Originally, fishery characteristics were being monitored for 84 rivers. Sakhalin Energy reported that an independent review of river monitoring was completed, and concluded that monitoring should continue in 10 rivers. An additional 5 rivers will be included to enhance understanding of spawning success at the crossings. (July 2009 Monthly Report) **May 10**: Sakhalin Energy report that the post-construction river monitoring report for 2009 was received, and results have been evaluated. Of the 15 rivers monitored in 2009, no impact was identified in11 rivers. Four rivers still show altered conditions downstream of crossings, including Leonidovka and Gornaya (which were impacted by the cyclones last year), Nitui (which has changed its course), and Lesnaya. These 4 rivers have been included in the 2010 monitoring programme. **Action**: Implement medium term river environmental sampling and monitoring programme (2008-2011) and provide evaluation of results. **10.06.10**: Sakhalin Energy undertakes twice-yearly monitoring (sampling) of selected sensitive rivers under the provisions of the Environmental Monitoring Programme (EMP). The programme depends on the size of the spawning areas downstream of the pipeline crossing and erosion development potential. AEA recommends that all sensitive rivers that were disturbed by the recent (late 2009/early 2010) emergency repairs be added to this (or a similar) monitoring programme. AEA recognises that river monitoring is required by the Water Permit (to be undertaken by the contractor after the construction	XXXXXX, XXXXXX

Ref[6]	Rank[7]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
							period of in-river engineering work) however it is recommended that further monitoring is considered depending on the outcome of this monitoring, for example if continued increased suspended solids are noted. AEA further recommends that in the future, all sensitive rivers that have been significantly disturbed should be monitored as a matter of course, as part of a similar programme for an appropriate length of time to ensure recovery of the river. **Action**: After corrective engineering works are undertaken on a river, include such rivers in the next hydrology and hydrochemistry monitoring program scope (for hydrocarbon, sediment and hydrological parameters). Thereafter, such locations shall be included in the monitoring program, results evaluated and compared to pre-disturbance conditions, until the parameters (particularly suspended solids) return to normal levels.	
LAND.07	Low Amber	**Open**	Aug 07	Land management – remediation of river habitats	RemAP R3 item	1) Obtain expert input and agreement with Russian authorities on remedial actions, if any. Identify remediation benchmarks and criteria that indicate successful remediation. 2) Execute remedial actions, if any.	**May 10**: Based on analysis of river environmental sampling and monitoring results, additional intervention is not indicated at this time. The RoW inspection programme shall be implemented as per new Finding in June report (LAND.14). **Action**: Based on evaluation of results of 2010 river environmental sampling and monitoring programme, determine whether any rivers remedial actions are required as per RemAP R3.1.	XXXXXX
LAND.09	High Amber	**Open**	Sep 07 (Table 6-4 Item 6.24)	Land management – temporary equipment/ bridges	0000-S-90-04-O-0254-00-E Appendix 8	Remove equipment bridges as soon as possible after permanent seeding.	**23.04.10**: Sakhalin Energy reported that 15 temporary bridges are planned to be removed. Construction was still ongoing for 5 access roads. A survey is planned to identify and evaluate remaining temporary bridges. **10.06.10**: As per LAND.12, the Orkunie River bridge will be modified to be able to contain any spillage on bridge surface and thereby protect the river from pollution. Survey must be conducted to identify what is required to make it permanent. Appropriate authority approvals to be obtained as required. **Action:** Complete additional survey of temporary bridges. Identify bridges to be removed, and requirements for bridge upgrade where applicable. Provide updated plan for temporary bridge removal and permanent bridge upgrade. **Action**: Provide to Lenders six-monthly updates on the status of implementation of the plan for removal/upgrade of temporary bridges.	XXXXXX, XXXXXX

Ref[6]	Rank[7]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
LAND.11	Low Amber	**Open**	Sep 08 (p 18)	Construction camps – Pipelines	0000-S-90-04-O-0259-00-E Appendix 1	Detailed decommissioning plans are required for construction camps once the future disposal/ abandonment options are confirmed, including plans for the disposal of assets and materials and appropriate site investigation/remediation and to manage the termination of local employment. Guarantees must be in place to ensure camp emissions and effluents remain within legal limits. Sakhalin Energy to provide AEA with quarterly updates on current status of camp demobilisation/ decommissioning plans, including whether these will be sold or retained/mothballed by Sakhalin Energy.	**Jan 10**: Progress update provided. **23.04.10**: Detailed progress presentation provided to AEA in relation to pipeline construction camps. **Action**: Provide quarterly updates on decommissioning of temporary facilities (including Pipeline and Asset camps and other sites).	XXXXXX
LAND.14	High Amber	**New**	Jun 10	Biological Reinstatement	0000-S-90-04-O-0254-00-E Appendix 6	In some areas, biological reinstatement has deteriorated over the last two years, partly due to the lack of retention of topsoil at the start of construction activities and partly due to a lack of aftercare following the initial seeding work. It is recommended that Sakhalin Energy adopts a more proactive and robust system for ground maintenance over and above their current RoW engineering maintenance.	**Action**: Sakhalin Energy to provide a plan for further biological reinstatement, identifying locations and bioremediation strategies proposed. This should include items such as re-seeding in areas where the growth is patchy, hydro-seeding, on-going fertilisation of areas where the growing medium is thin and consideration of alternative seed stocks to introduce indigenous plants or more robust species such as clover where grass is apparently unsuccessful.	XXXXXX
LAND.15	Low Amber	**New**	Jun 10	Land Management – silt fences	0000-S-90-04-O-0254-00-E Appendix 6	Sakhalin Energy used silt fencing extensively and effectively to reduce siltation of rivers during construction. Some locations still have the silt fences in place and they continue to function well. In other locations, the fences are damaged from storms and from occasional theft of the textile. Additional silt fences (in conjunction with silt traps) should be considered in sandy slope areas where there is little vegetation and significant run-off from the RoW. It is also clear that some well vegetated locations do not require the protection any longer.	**Action**: Sakhalin Energy to evaluate the need to add, replace, maintain or remove the silt fences on a site by site basis. If silt fences are not considered necessary, they should be removed from the area and disposed of appropriately.	XXXXXX

Ref[6]	Rank[7]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
BIODIVERSITY								
BIODIV.04	High Amber	**Open**	Sep 07 (p141)	Biodiversity – Wetlands monitoring W2	RemAP W2, 0000-S-90-04-O-0009-00-E Appendix 6	Complete post-construction monitoring of wetlands as per RemAP scope W2, which is: 1) Appoint suitably qualified Third Party Contractor(s) for delineation and classification work. 2) Wetlands delineated on baseline data sets. 3) Wetland classified by ecological and physical characteristics into wetland "Classes". 4) Field observation for desktop studies verification and impact assessment. 5) Completion of classification work. 6) Appoint suitably qualified Third Party Contractor(s) for carrying out field surveys. 7) Reference Surveys and Year 1 Post Construction Monitoring surveys completed. 8) Monitoring reports from Reference Survey and Year 1 Post Construction Monitoring submitted to Sakhalin Energy for review. 9) Post construction monitoring completed during the second and third years after construction 2008-10.	**Nov 08**: Sakhalin Energy reported that 2008 wetland monitoring scope was executed (Monthly Report November 2008). **May 09**: Sakhalin Energy reported that scope of work for 2009 was completed (Monthly Report May 2009). **Aug 09**: 2009 wetland monitoring programme has been completed and draft report is currently being prepared. **06.04.10**: Sakhalin Energy reported that: • 2007-2009 monitoring scope has been completed, • a contract is in place for 2010 and 2011 for wetlands monitoring, • RemAP requirements have been incorporated into ongoing Local Monitoring programmes, and the HSE Monitoring Overview (previously Annex C, now 0000-S-90-04-O-0009-00-E Appendix 6), which includes wetlands monitoring requirements, is to be reviewed with Lender approval within 6 months following Project Completion. **23.04.10**: Items 1-8 have been completed, item 9 is in progress. **Action**: Complete wetlands environmental sampling and monitoring 2010 scope.	XXXXXX
BIODIV.05	High Amber	**Open**	Sep 07 (p141)	Biodiversity – Wetlands remediation W3	RemAP W3, 0000-S-90-04-O-0009-00-E Appendix 6	Complete remediation of wetlands as per RemAP scope W3, which is: 1) Assessment of immediate remediation works required. 2) Development of practical tools to be used by the construction team for wetland remediation upon completion of the construction activities. 3) Immediate remediation measures implemented (as determined on a site by site basis) by Sakhalin Energy Reinstatement and Environmental coordinators and carried out under their supervision. 4) Remediation Plan and Prioritisation list developed. 5) Remediation measures implemented under Reinstatement and Environmental Coordinators' supervision. 6) The need for post-construction remediation measures identified via inspection and monitoring 2008-2010 and advice sought from wetlands expert. Remediation measures implemented under Operations supervision.	**23.04.10**: Items 1-5 completed. **Action**: Based on evaluation of results of 2010 wetlands environmental sampling and monitoring programme, determine whether any wetlands remedial actions are required as per RemAP W3.6.	XXXXXX

Ref[6]	Rank[7]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
BIODIV.06	High Amber	**Open**	Sep 09 (p7)	Biodiversity – Dolinsk Wetlands	0000-S-90-04-O-0259-00-E Appendix 4, and RemAP W1	AEA notes that running track consisting of cut trees, and bog mats (steel and wooden) and other construction debris still remain in Dolinsk wetland. If not removed, this debris can restrict the hydrological flow through the wetland and hence the successful and timely recovery of the area.	**Sep 09**: 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. **Feb 10**: Sakhalin Energy reported that an assessment to determine the safest and most effective removal method was completed. Some of the wetlands works planned for February 2010 were suspended due to unsafe working conditions. The situation will continue to be assessed and work will recommence when conditions allow. **23.04.10**: Sakhalin Energy reported that work was commenced however stopped due to inaccessibility (deep snow). Works to be resumed in Spring if safe and possible. **21.06.10**: Sakhalin Energy reported that works removing the debris in the Dolinsk Wetlands have commenced, and an update on progress will be provided as requested end October 2010. **Action**: Sakhalin Energy to remove debris from Dolinsk Wetland where safe and physically possible.	XXXXXX
OIL SPILL RESPONSE								
OSR.05	High Amber	**Open**	May 09 (p 27)	Oil Spill Response Plans	0000-S-90-04-O-0014-00-E Appendix 15	Current versions of the OPF and Onshore Prigorodnoye plans assume 100% secondary containment 100% of the time and therefore do not contain measures for reacting to an incident in which a spill breaches the facility containment. International best practice requires this to be analysed in a worst-case scenario. AEA recommends the plans be revised to accommodate international best practice procedures.	**09.03.10**: Sakhalin Energy agreed that the plans should be revised as indicated. However, the schedule for revision and associated regulatory review timelines make it impractical to complete this in the short term. Hence addenda will be prepared. **Action**: Review capabilities for response to loss of secondary containment on OPF and Onshore Prigorodnoye and document response arrangements in temporary internal addenda to the OSRPs.	XXXXXX
OSR.10	High Amber	**Open**	Sep 09 (p 11)	Oil Spill Response	0000-S-90-04-O-0014-00-E Appendix 15	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.	**Action**: Consider and respond to consultant PCCI's recommendation to add information and procedures on "electrical hazards" to the discussion on health and safety in the "Sakhalin Energy Oiled Wildlife Responders Field Manual".	XXXXXX

Ref[6]	Rank[7]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
OSR.11	Low Amber	**Open**	Sep 09 (p 11)	Oil Spill Response	0000-S-90-04-O-0014-00-E Appendix 15	Since the Wildlife Rehabilitation Centre (WRC) 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.	**Action**: Schedule and undertake a full scale exercise in establishing the WRC under mock-emergency conditions within 6 months of commissioning the LNG warehouse. Document any difficulties and delays encountered and any appropriate actions to improve the process in the future.	XXXXXX
OSR.12	Low Amber	**Open**	Sep 09 (p 11)	Oil Spill Response	0000-S-90-04-O-0014-00-E Appendix 15	It is recommended that Sakhalin Energy establishes and conducts appropriate training and refresher training for all personnel involved in the Wildlife Rehabilitation Programme.	**Action**: Identify target group for Wildlife Rehabilitation training. Identify/develop training programme (content, trainer, frequency). Conduct training for all personnel involved in the Wildlife Rehabilitation Programme.	XXXXXX
OSR.13	High Amber	**Open**	Sep 09	Oil Spill Response	0000-S-90-04-O-0014-00-E Appendix 15	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).	**Action**: Provide an opportunity for the Lenders' representatives to observe an OSR Exercise, including to undertake adequate on-site observation and evaluation of the activation and decision-making processes associated with the ECT or CMT and particularly Offshore operations.	XXXXXX

Ref[6]	Rank[7]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
OSR.14	Low Amber	**Open**	Sep 09	Oil Spill Response – redacted/ summary plans	0000-S-90-04-O-0014-00-E Appendix 15	PCCI discussed the current asset-specific OSRPs, specifically where the OSRPs were considered to fall short of international best practice and standards; Sakhalin Energy concurred with PCCI's suggestions, and planning for a potential breach of secondary containment would now go forward. Sakhalin Energy to publish redacted/summary OSR Plans as per PCCI's recommendations.	**09.03.10**: Sakhalin Energy proposed to revise the redacted plans to include the information as recommended by PCCI (however of course we reserve the right to omit commercial, legal, and security-sensitive information): - Primary, secondary and worst case oil spill risks - Discovery and notification process - Spill pathways, receptors (i.e. environmental, economic, cultural and historic resources), and sensitivities and priorities for protection - Sakhalin Energy response resources (personnel and equipment) and strategies for protection, recovery, disposal, and restoration and recovery of the environment - Sakhalin Energy readiness in terms of equipment maintenance, upgrade, compatibility with the operating environment, and also in terms of personnel qualifications and experience - Sakhalin Energy compliance with RF standards and industry best practice. Also proposed to change the terminology from "redacted" to "summary" of plans as indicated in the attached Draft 3 specification. This was supported. **Action**: Update and republish Summary OSR Plans for Assets, as per item OSR.13. Provide to AEA/PCCI for review.	XXXXXX
OSR.15	High Amber	**Open**	Apr 10	Summary ER Standard	0000-S-90-04-O-0014-00-E Appendix 15	Sakhalin Energy has committed to publish a "Summary of the Corporate ER Standard in relation to oil spill preparedness and response".	**Action:** Provide a draft "Summary of the Corporate ER Standard in relation to oil spill preparedness and response" for Lender comment.	XXXXXX
OSR.16	Green	**Open**	Apr 10	Wildlife Oil Spill Response	0000-S-90-04-O-0014-00-E Appendix 15	All newly procured wildlife rescue and rehabilitation equipment is currently stored different places in a general warehouse, alongside other workshop supplies, spares and equipment, ready to move into the new warehouse. As a result, the existing warehouse has become overstocked and untidy, with housekeeping standards slipping as more items are temporarily moved in. This equipment is currently at risk of being mislaid and/or damaged.	**Action:** Ensure all wildlife OSR equipment is moved to a dedicated part of the new warehouse, once it is commissioned.	XXXXXX
HEALTH AND SAFETY								
H&S.02	High Amber	**Open**	May 09 (p 27)	Health and safety	0000-S-90-04-O-0261-00-E Appendix 1	Four security-related incidents occurred at Block Valve Stations in which fences and electrical cables were cut. Sakhalin Energy stated that motion detectors and cameras will be installed to prevent future occurrence.	**23.04.10**: Sakhalin Energy reported that Security Up-Grade Plan started on 01.08.09. CCTV system and detection sensors "radio barrier" were installed at 73% of most critical BVS by end March 2010. **Action**: Complete 100% BVS Security Up-Grade Plan.	XXXXXX

Ref[6]	Rank[7]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
H&S.04	Low Amber	**Open**	Apr 10	Health and Safety	0000-S-90-04-O-0261-00-E Appendix 1	There is insufficient storage room in the Prigorodnoye site laboratory. Clutter and overfilled shelves/cupboards present a health and safety risk to lab personnel.	**Action**: Consider optimisation of laboratory area and/or moving the offices out of the lab to enable better storage of consumables/equipment/waste, and report outcome to lenders.	XXXXXX
H&S.05	Low Amber	**Open**	Apr 10	Health and Safety	0000-S-90-04-O-0261-00-E Appendix 1	Two unidentifiable samples of glycol from the turbine coolers had been delivered to the lab for testing in plastic water bottles rather than the appropriate sample bottles. No paperwork had been submitted with the sample.	**Action**: Conduct an awareness session and distribute materials on the use of correct sample containers and the scheduling requests and enforce the sample procedure.	XXXXXX
H&S.06	Low Amber	**Closed**	Jun 10	Health and Safety	0000-S-90-04-O-0261-00-E Appendix 1	The RoW is crossed by a number of federal and public access roads, and unauthorised use of the RoW is obvious in many locations. As a result, a large proportion of the RoW signage and some KP marker posts have been removed by locals (particularly next to federal/access roads), and thought to be put to personal use as snow shovels and similar. While we recognise that theft of signage is somewhat inevitable, these signs do display the telephone numbers to call in case of emergencies associated with the pipeline.	**Action**: Replace missing signage, securing it more firmly to the posts, perhaps by welding rather than screwing them on, or using a sign shape not so conducive for use as snow shovels. Alternatively consider printing the emergency information on the posts themselves. **28.07.10**: Sakhalin Energy reports that the majority of missing signs have now been replaced, and this is part of the ongoing maintenance programme. Sakhalin Energy has investigated alternatives for securing signs more firmly. However, the shape of the signs cannot be changed as it is specified by RF Regulations, and printing on the posts is also not permitted for the same reason. The Company has decided that welding the signs is not practicable since it needs to be done under Hot Work Permit and Pipelines are not resourced with sufficient accredited welders for such scope. Also there are a substantial number of cases where the signs are damaged (shots, impacts, scratches) and also require replacement. Hence, Sakhalin Energy has taken the business decision not to change its approach. As stated above, the replacement of missing signs is part of the regular maintenance programme. **29.07.10**: Finding closed based on the above advice. AEA will check the status of missing/ replaced signage on its next RoW monitoring visit.	

Ref[6]	Rank[7]	Status	Date	Topic	HSESAP Ref.	Finding	Action Progress Review	Action#
SOCIAL								
SOC.01	Green	**Open**	May 10 (p.11)	Public Availability of Targeted SIAs	SP Standard (0000-S-90-04-O-0021-00-E)	The summary of the SIA/scoping exercise for the LNG accommodation on the website needs to be updated to include a map/overview of the physical infrastructure in relation to neighbouring areas, as well as a description of measures taken to manage and monitor social impacts.	**01.07.10:** The summary of the SIA/scoping exercise for the LNG accommodation on the website will be updated to include a map/overview of the physical infrastructure in relation to neighbouring areas, as well as a description of measures taken to manage and monitor social impacts (Target date: Aug 31, 2010).	XXXXXX
SOC.02	Green	**Closed**	May 10 (p.11)	Social monitoring for operational phase	SP Standard (0000-S-90-04-O-0021-00-E)	Sakhalin Energy needs to undertake ongoing monitoring of the households neighbouring the LNG permanent accommodation, and investigate the resolution of the existing grievances, as well as the additional concerns expressed by neighbours.	**01.07.10:** Sakhalin Energy will undertake ongoing monitoring of the households neighbouring the LNG permanent accommodation, and investigate the resolution of the existing grievances, as well as the additional concerns expressed by neighbours. First monitoring was completed in June, to be continued on regular basis. Grievance was lodged, investigated, and resolved with signed satisfaction letter. Finding closed.	
GENERAL								
GEN.02	Low Amber	**Open**	Apr 10	Monitoring	0000-S-90-04-O-0009-00-E Appendix 6	HSE Monitoring Overview is to be revised considering monitoring results to date and operational requirements.	**Action**: Review HSE Monitoring Overview (0000-S-90-04-O-0009-00-E Appendix 6) and update where appropriate within 6 months of formal Project Completion date.	XXXXXX
GEN.03	Low Amber	**Open**	Apr 10	General	International Requirements specifications	"International Requirements" and "Standards Comparison" specifications are based on original project data and standards in force at date of signing. These documents shall be reviewed based on operational data and revised standards where applicable, within 12 months following Project Completion.	**Action**: Review "International Requirements" and "Standards Comparison" specifications referenced in HSESAP and update where appropriate within 12 months of formal Project Completion date.	XXXXXX

Appendices

Appendix 1 – Individual RoW Observations

Appendix 1 – Individual RoW Observations

Contents:

List of RoW Locations Visited			
KP	River / Location	Team	Date Visited
22.7	Khandusa River	Northern	3 June 2010
36 – 38.3	Access route to Askasi River	Northern	3 June 2010
62	Dagi River	Northern	3 June 2010
67	Tomi River	Northern	3 June 2010
83.2	Mali Veni access	Northern	3 June 2010
64.5	Access road to TOB-01	Northern	4 June 2010
65.2	Pilenga River	Northern	4 June 2010
56.6	Svetly Stream	Northern	4 June 2010
45 – 49	General RoW	Northern	4 June 2010
41.8	Nabil River	Northern	4 June 2010
37.8	Vstrechny River	Northern	4 June 2010
24.5 - 15	NOB-01 Access Road	Northern	5 June 2010
14.9	Plelyarna River	Northern	5 June 2010
19.2	Vatung River	Northern	5 June 2010
148.5 – 156	Access road from OPF to NOB-24	Northern	5 June 2010
84.2	Voskresenka River	Northern	6 June 2010
95	Tym	Northern	6 June 2010
124 – 127.7	Sandy Slopes	Northern	6 June 2010
143.4	Taulanka River	Northern	6 June 2010
168.6	Onor River	Northern	6 June 2010
174.4	Pyataya Rechka River	Northern	7 June 2010
176.2	Sedmaya River	Northern	7 June 2010
178.4	Devyataya River	Northern	7 June 2010
	Fault Crossing 7	Northern	7 June 2010
212	Pobedinka River	Northern	7 June 2010
255.7	Nizhny Kamenka (Matrosovka) River	Northern	7 June 2010
~276.6	Unnamed Stream near Leonidovka	Northern	7 June 2010
300	Gastellovka River	Southern	2 June 2010
303.8	Kissa River and Fault Crossing 9	Southern	4 June 2010
316.4	Goryanka River and RoW	Southern	3 June 2010
326.6	Nitui River	Southern	3 June 2010
344	Gornaya River	Southern	3 June 2010
346.5	Vidnaya River	Southern	3 June 2010
348.8	Gar River	Southern	3 June 2010
351	Khormovaya River	Southern	3 June 2010
352	Krinka River	Southern	3 June 2010
360.4	Makarova River	Southern	5 June 2010
361.4	Solyanka River	Southern	5 June 2010
362	Sosnovka River	Southern	5 June 2010
369.6	Pegas River	Southern	5 June 2010
370.2	Lesnaya 1 River	Southern	4 June 2010
371.2	Lesnaya 2 River	Southern	4 June 2010
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380.6	Lesnaya 3 River	Southern	4 June 2010

384.5	Lazovaya River	Southern	4 June 2010
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414 – 415	RoW and unnamed stream	Southern	5 June 2010
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421.4	Pugachevka River	Southern	6 June 2010
434.4	Unnamed tributary to Travyanaya River	Southern	6 June 2010
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442	RoW north of Tikhaya River	Southern	6 June 2010
444.3	Tikhaya River	Southern	6 June 2010
449	Duet 2 River	Southern	6 June 2010
449.5	Duet 3 River	Southern	6 June 2010
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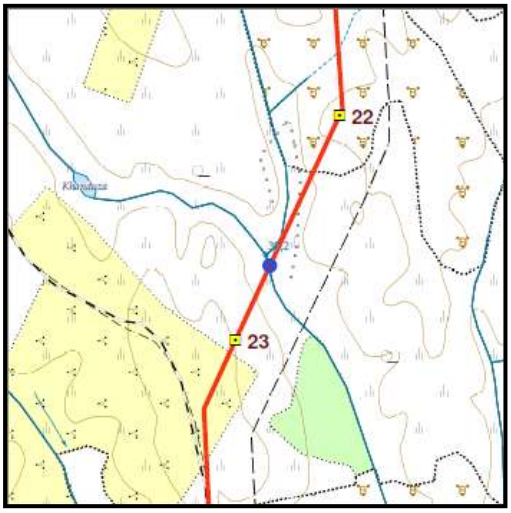
483.7	Slavnaya River	Southern	6 June 2010
488.3	Primorskaya River and RoW	Southern	6 June 2010
490.3	Nizhni Kamisovka River	Southern	7 June 2010
497.2	Listvonitza River and Fault Crossing 17	Southern	7 June 2010
510.4	Podgornaya River	Southern	7 June 2010
510.5	Sovetskoye Ridge and Ai Valley	Southern	7 June 2010
511.5	Ai River and slope	Southern	7 June 2010
512	Sandy slopes and Fault Crossing 19	Southern	7 June 2010
532	Dolinsk Wetlands	Northern	8 June 2010
600.6	Paltovka River and RoW	Southern	8 June 2010
608	RoW	Southern	8 June 2010
611	RoW	Southern	8 June 2010
614.5	RoW	Southern	8 June 2010
616	Korsakov BVS	Southern	8 June 2010
617	Korsakov River and slopes	Southern	8 June 2010
621	BVS above Mereya River	Southern	8 June 2010
622	Mereya River and slopes	Southern	8 June 2010

KP 22.7 Khandusa River



The river is crossed by the pipeline on a slight oblique angle (see map).

The river banks are protected by Reno matting which appears in good condition with a limited amount of growth through the matting starting to appear (Photo 1). The RoW slopes to the north show evidence of good vegetation, particularly on the lower slopes towards the river where the peat concentrations are higher, and the slope breakers appear to be functioning well (Photo 1). The southern bank appears to be more sandy and, while there is evidence of reasonable vegetation over the last year, there is still evidence of the start of erosion rills forming (Photo 2) the time of year so close to the snow-melt made it difficult to ascertain as to whether there will be a recovery of vegetation this year. In places the erosion is becoming more severe with washouts behind slope breakers (Photo 3) and sand and silt run-off away from the RoW (Photo 4).

It was noted that across the width of the RoW in the river bed there was a significant deposit of fine sand and silt over the river bed. This was only apparent in the RoW indicating that materials are being washed into the river, possibly through the Reno mats.

Photo 1 – Northern Bank and Slopes

Photo 2 – Southern Bank and Slopes

Photo 3 – Washout behind Slope Breaker

Photo 4 – Silt run-off from the RoW

Photo 5 – Sediment Build up in RoW River Bed

KP 36 – 38.3 Access Route to Askasi River

The access and RoW is along a very sandy undulating stretch with sparse vegetation (see map).

The pipeline RoW is gently sloped from east to west along this stretch with pronounced run-off evidence across the slope and the lack of vegetation growth is resulting in several areas of silt run-off (Photo 1) and erosions rills forming (Photos 2 and 3). This in turn is leading a large volume of material spreading off the RoW into the surrounding countryside (Photo 4).

There is an urgent need in this area for further drainage works to control the run-off across the slope and re-seeding / soil protection to prevent further silting.

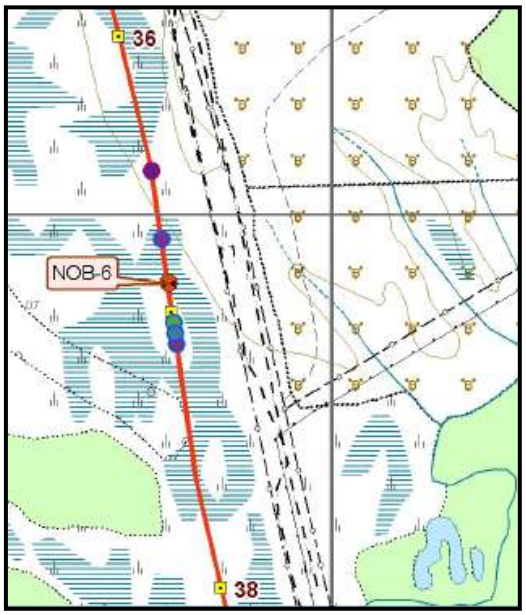


Photo 1 – Vegetation lack and start of silting

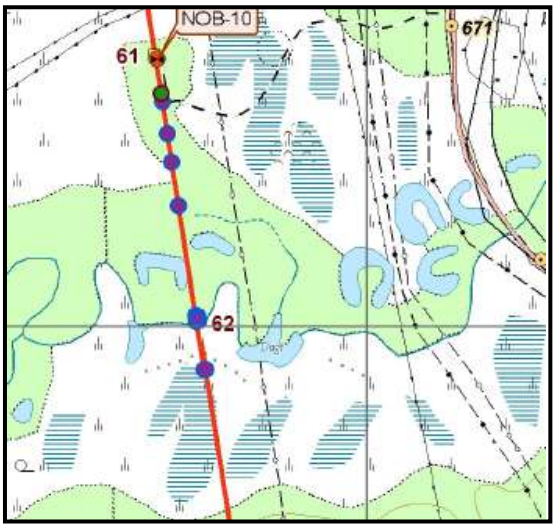
Photo 2 – Erosion rills forming

Photo 3 – Erosion runs from east to west across RoW

Photo 4 – Silt and sand run-off away from the RoW

KP 62 Dagi River

The river crossing is a straight forward perpendicular crossing, although the river valley also contains some ox-bow lakes and low-lying marshy ground (see map).



The northern approach to the crossing was very wet but showing good signs of re-vegetation, the protection works installed along the shore of the ox-bow lake to the west of the RoW were in good condition with the Reno mats undamaged (Photo 1). The main river crossing was in good condition with the Reno mats in position as far as could be ascertained due to a thick covering of silt from the river. The silt layer is proving to be a good growing medium for the re-vegetation of the river bank (Photos 2 and 3) which will have the beneficial long-term effect of further bank stabilisation. The southern bank and approach to the river seemed to be in good condition and showing good vegetative growth (Photo 4).

Photo 1 – Ox-bow lake bank protection

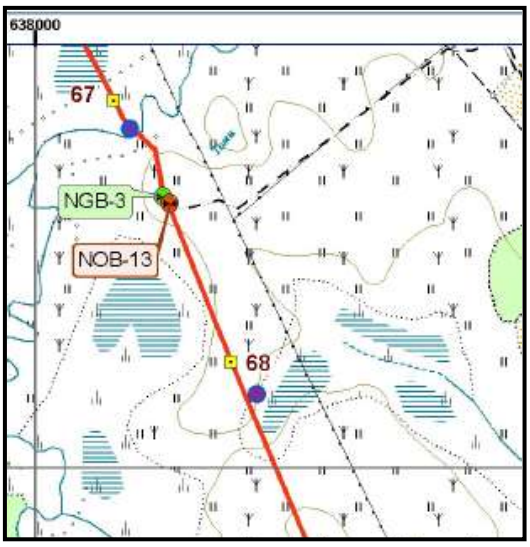
Photo 2 - Silting and re-vegetation of north bank

Photo 3 – North bank silting of Reno mats

Photo 4 – View to south bank

KP 67 Tomi River

The Tomi River crossing lies in a flat meander of the river in undulating topography (see map).



The crossing area itself has the Reno mats in reasonable condition with some silting up from river deposition; the vegetation around the river has recovered well (Photo 1). There is some evidence that the meander to the east of the crossing has cut into the bank further and there is a risk that this could cut in behind the RoW bank protection (Photo 2). This should be monitored for further development and, where necessary, bank protection work undertaken.

Vegetation further away from the river on the north side has not established so well, this has led to erosion and silt run-off in places that has overwhelmed the silt fencing (Photo 3). Work is required to re-vegetate the RoW in the long-term and to remove silt and replace silt fencing in the short-term.

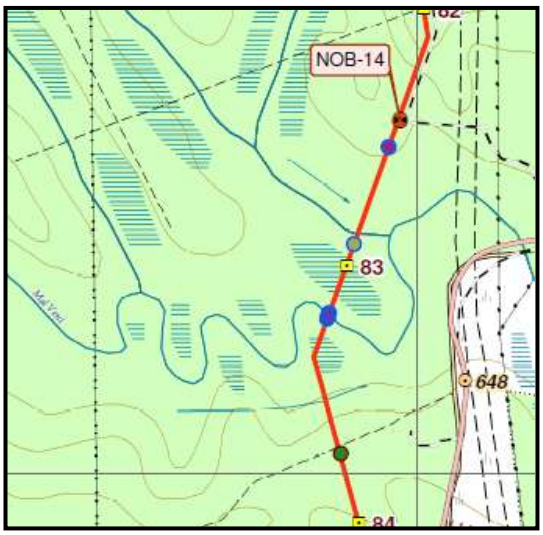
Photo 1 – Bank protection and vegetation

Photo 2 – Meander to rear of RoW

Photo 3 – Silt fencing overwhelmed

KP 83.2 Mali Veni Access

The Mali Veni access was walked from NOB14 down towards KP83, the topography being a long sandy slope down to the river valley. Access to the main river was prevented by a tributary river that could not be crossed at this time (see map).



Vegetation at the top of the hill is sparse (Photo 1), although at this site there is no evidence of erosional features forming and the slope breakers are holding well, this is an improvement as the area had a major silt flow occur in 2006/07. The vegetation growth improves further down the hill (Photo 2) and is good in the river valley area where there is more peat and organic matter in the soil (Photo 3).

Work is required at the site to improve the vegetation on the hill tops and upper slopes.

Photo 1 – Sparse vegetation on hill tops

Photo 2 – Thicker vegetation on lower slopes

Photo 3 – Good vegetation in river valley

KP 64.5 Access Road to TOB-01

The road into TOB-01/TGB-01 is a company constructed access into the river valley from the federal highway via road TA10-4, (see map).

The approach road is generally well made and holding its integrity, however on the slope down to the main valley there is evidence of the start of a wash-out forming (Photo 1) which is leading to silting of the river valley (Photo 2) and subsidence of the road and safety barrier (Photos 3 and 4). Some road maintenance is required to improve the road surface and barrier at this point to prevent on-going failure.

The drainage of the slope run-off needs improvement to prevent further erosion and silt controls, silt fencing or trench breakers, to be installed to stop further silting of the valley floor.

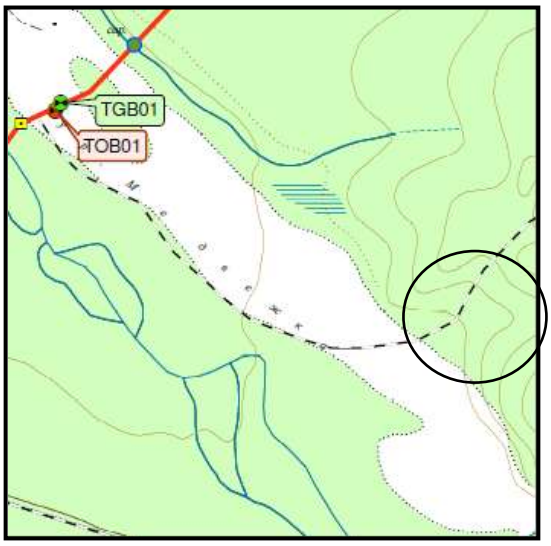


Photo 1 – Erosion rill at side of access road

Photo 2 – Silt run-off on to valley floor

Photo 3 – Access road subsidence

Photo 4 – Road and barrier damage detail

KP 65.2 Pilenga River

The river is approached from TOB-01 along a gravelly river valley with the crossing going over three shallow river channels (see map).

The river banks are in good condition with silting of the bank encouraging growth and bank stabilisation (Photos 1 and 2), the river bed appears clean and gravelled.

The approach to the river is partially re-vegetated with a reasonably healthy looking cover coming through although this is still quite patchy and may require further fertilising in the future to encourage further growth (Photos 3 and 4).

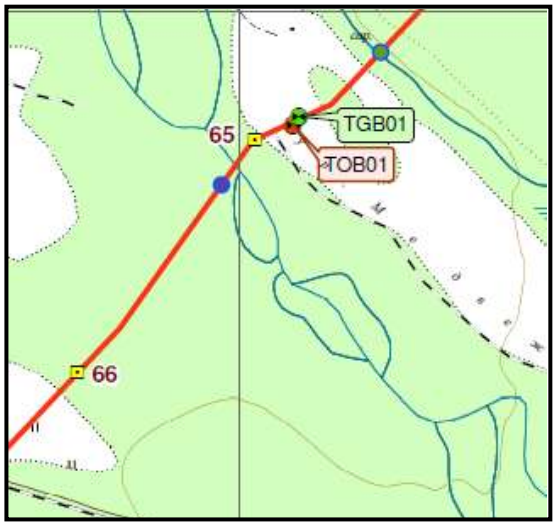


Photo 1 – River crossing looking south-west

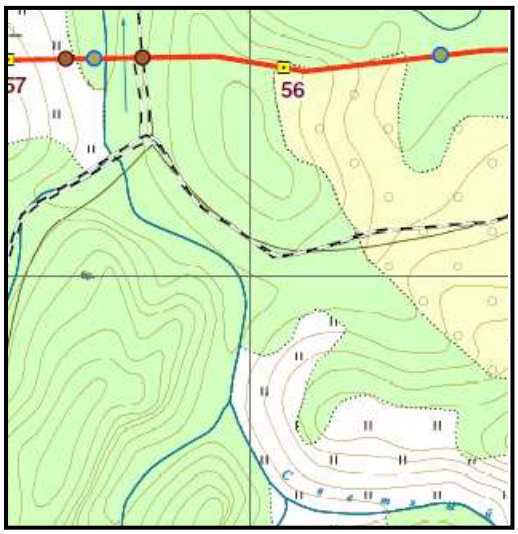
Photo 2 – Re-vegetation of river bank

Photo 3 – RoW vegetation looking to TOB-01

Photo 4 – Re-vegetation detail

KP 56.6 Svetly Stream

The river crossing is situated in gently undulating hills with sandy soils (see map).



The river crossing is protected by rip-rap and was in very good condition with the river running clean with no evidence of silting (Photo 1).

The re-vegetation is good close to the river on the lower slopes (Photo 2) but the old running track is still visible due to poor vegetation recovery (Photo 3) and the hill tops also show poor vegetation (Photo 4), although it was noted that the slopes were structurally sound with the slope breakers working well. Fertiliser application will be required in these areas and some limited re-seeding in the more barren areas.

Photo 1 – Svetly Stream banks

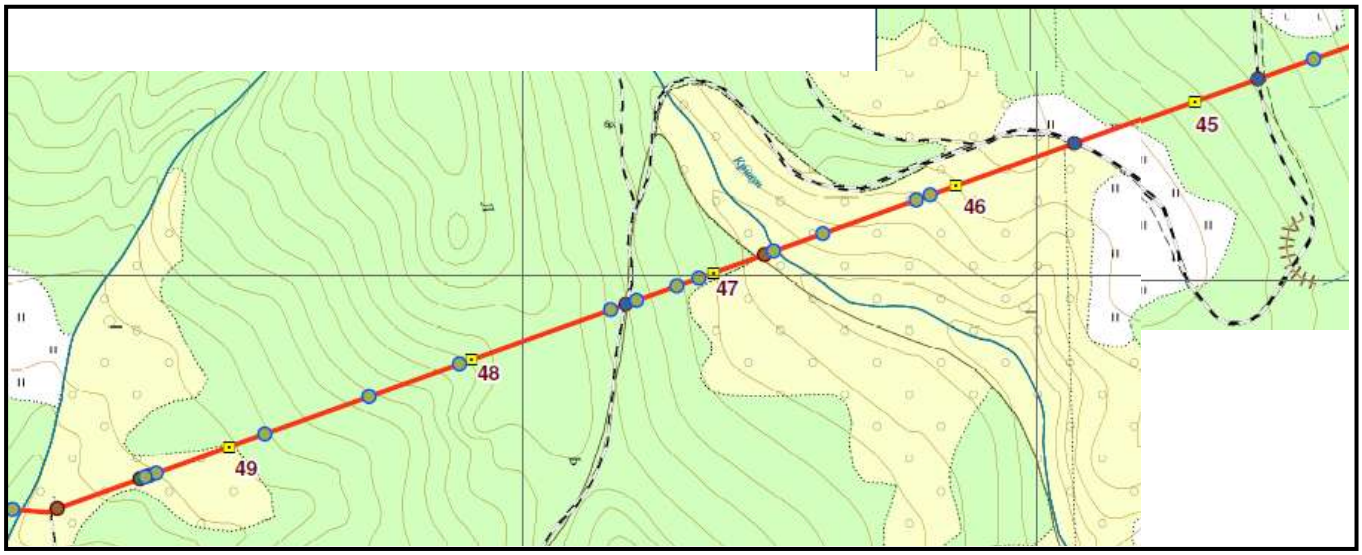
Photo 2 – Svetly Stream west bank re-vegetation

Photo 3 – Running track looking east

Photo 4 – Hill top sparse re-vegetation

KP 45 to 49 General RoW

The RoW runs through undulating, hilly terrain reaching its highest elevation on the island (see map).



The RoW over this stretch is in very good condition with all slopes holding well and in general good re-vegetation (Photos 1, 2, 3 and 4). There are a few areas on the upper slopes where the vegetation hasn't taken so well (Photo 5) and these will require some attention with added nutrients or re-seeding. The small river crossing of the Krivon at KP46.8 is protected by rip-rap and is in good condition with the river bed being clean with no sign of silting (Photo 6).

Photo 1 – KP45.5 looking south west

Photo 2 – KP46.6 looking south west

Photo 3 – KP 49.8 looking north east

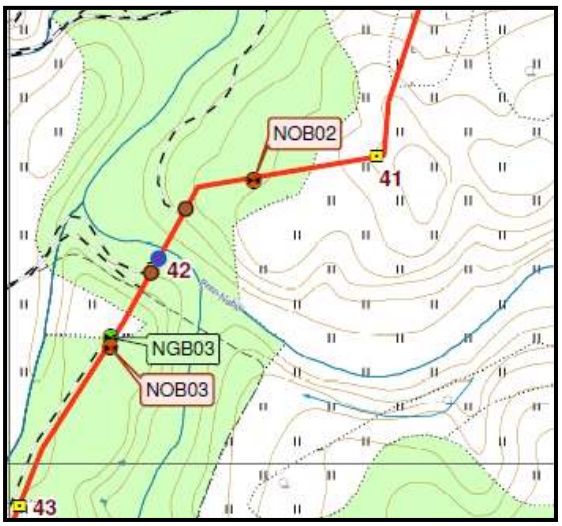
Photo 4 – KP 47.4 looking south west

Photo 5 – Upper slopes sparse vegetation

Photo 6 – River Krivon crossing

KP 41.8 Nabil River

The Nabil River crossing involved blasting through the bedrock across the river and taking a notch in two slopes to the south-west and north-east (see map).



Both of the slopes down to the river are in good condition with the south facing slope below NOB-02 re-vegetating well and the slope breakers being in good condition (Photo 1). The north facing slope is currently a scree slope and is unlikely to show any change for many years (Photo 2). However, the slope appears stable and is showing no signs of any failure or movement. The river banks have been widened slightly to ensure that there is no preferential scour and the banks have been strengthened using the larger material from the blasting operation, the banks and the river look to be in good condition (Photo 3). Away from the main exposed rock areas the vegetation is recovering well (Photo 4).

Photo 1 – South facing slope below NOB-14

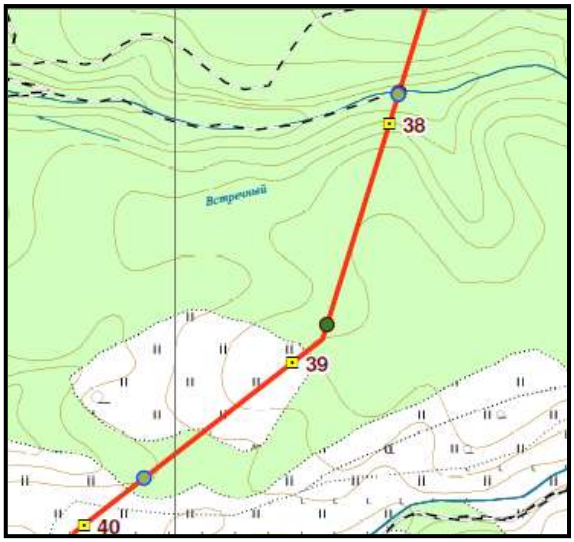
Photo 2 – North facing Scree Slope

Photo 3 – Nabil River Southern Bank

Photo 4 – Vegetation mat in Nabil Valley

KP 37.8 – Vstrechny River

A small but fast flowing river set in a steep valley (see map).



Due to the steep nature of the crossing and the problems of slope stability, the toes of slopes along the river are controlled through gabions (Photo 1). These all appear in good condition with the wiring holding well and no signs of movement at the toe.

The slopes on either side of the river are not re-vegetating well, although the coco matting placed immediately behind the gabions is still in place (Photos 2 and 3) and a small amount of growth is showing through these. However, further work is required to encourage growth further up the slopes.

During the visit it was noted that a tension crack had opened up at the top of the slope behind the gabions on the south bank (Photo 4). While this is not a major problem at present it will require monitoring in order to ensure that does not become a structural concern and may require drainage control and further engineering works.

Photo 1 – Gabion engineering at toe of slopes

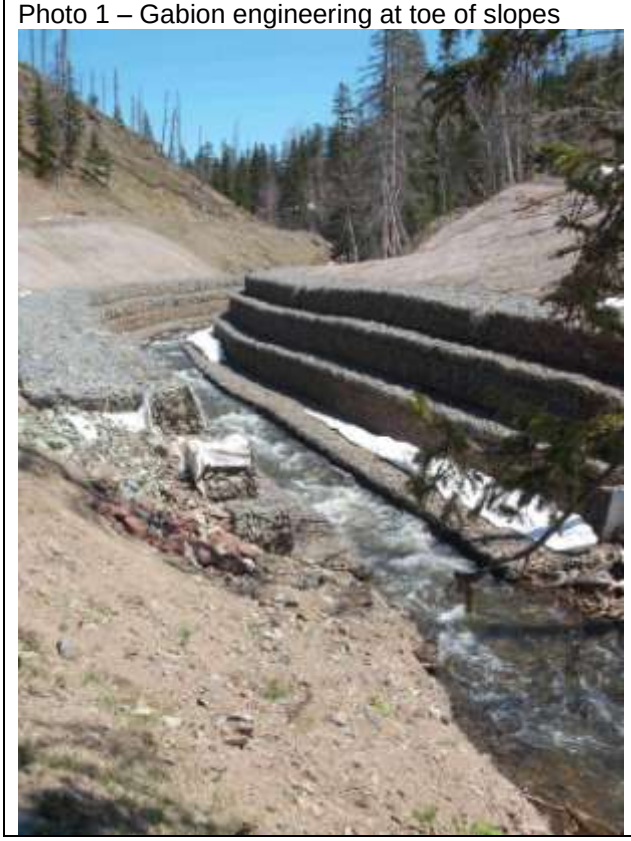


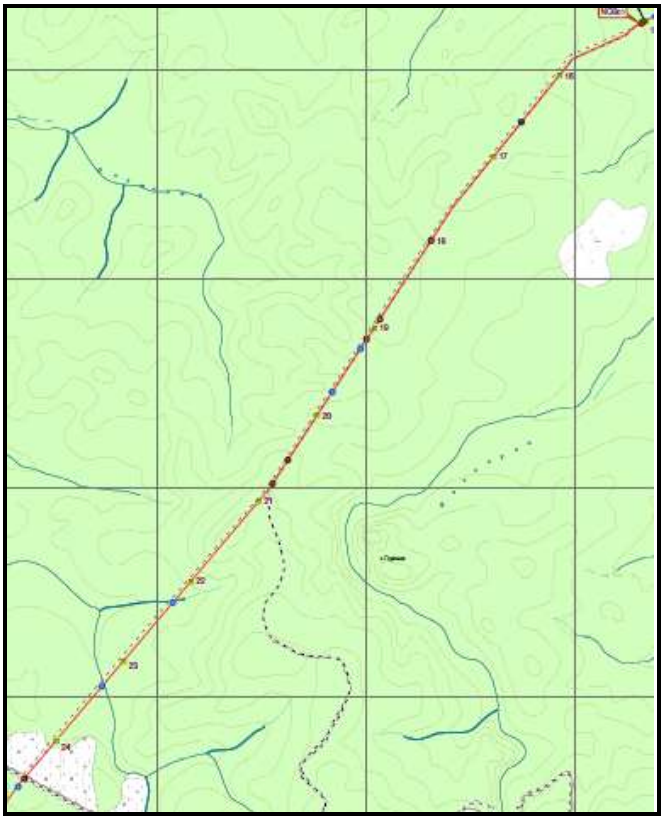
Photo 2 – Northern slope showing coco matting

Photo 3 – Southern slope

Photo 4 – Tension crack on southern bank

KP 24.5 – 15 NOB-01 Access Road

This is an approximately 10 km long access route along the RoW from the forestry road in the south to the BVS NOB-01 to the north east (see map).



While the access road itself is in good condition, the RoW is very sandy, showing very poor growth recovery, and in many places having extensive erosion rills and high silt and sand run-off (Photos 1, 2 and 3).

Some slope breakers have been overwhelmed due to the build up of sand behind them with the result that they overtop during precipitation or snow-melt run-off (Photo 4). Some of the drainage installed as part of the access road works has become choked with silt and will require cleaning out (Photo 5) and some silt fencing is no longer effective allowing silt and sand to flow into the streams along the RoW (Photo 6). There are a few areas, generally in low lying terrain where there are peat deposits, where the grass has taken, but this is the exception. Further work is required on the biological re-instatement along this access route.

Photo 1 – Lack of vegetation on RoW

Photo 2 – Formation of erosion rills

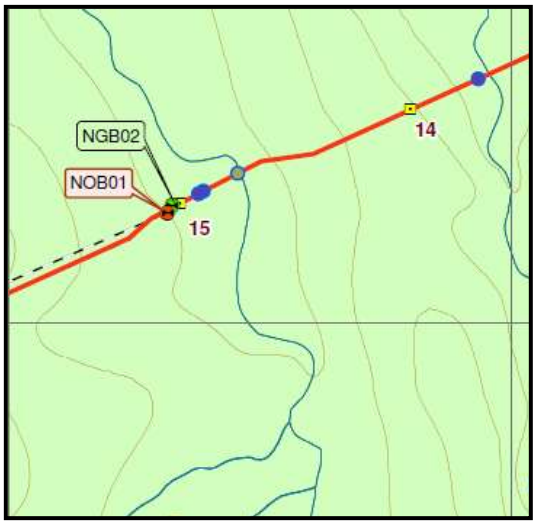
Photo 3 – Scour on RoW

Photo 4 – Sand build-up behind slope breaker

Photo 5 – Blocked drains on access road

Photo 6 – Damaged silt fencing KP 20

KP 14.9 Plelyarna River



A relatively low-flow river situated some 200 m to the north east of NOB-01 (see map).

The river banks were in good condition on the RoW with Reno mats holding well and accumulating silt which will encourage growth along the bank (Photo 1).

Some river bank erosion just upstream from the RoW was noted which, while not a problem at the time of the visit, has the potential to develop and scour behind the Reno mats on the eastern bank. This needs to be monitored carefully and corrective engineering undertaken as needed in the future. The re-vegetation of the eastern bank seems to be taking well (Photo 3), while the western bank vegetation is more sparse and may require further attention (Photo 4).

Some break-back of slopes under tree roots was noted despite the presence of geotextile (Photo 5) – this will require monitoring and possible reinforcement work before the next spring thaw. Redundant silt fencing was noted discarded to the side of the RoW, as at other places on the route (Photo 6). As a matter of good housekeeping this should be collected and disposed of at an appropriate facility.

Photo 1 – Reno mats on west bank

Photo 2 – Scour upstream on east bank

Photo 3 – East bank vegetation

Photo 4 – West bank vegetation

Photo 5 – Undercut tree roots, West bank	Photo 6 – Discarded silt fence
	

KP 19.2 Vatung River

The Vatung is a small river flowing through a peat bog area (see map).

During construction, this river was extensively damaged by the installation of the pipe crossing. Extensive work and repairs have been undertaken at the crossing and the river now flows clean between two banks of Reno mats (Photo 1) that appear to be in good condition and holding well. The RoW has been re-graded back to the original profiles and extensive drainage installed on the eastern bank and slope (Photo 2). Re-vegetation will be slow in this area due to the acidic and saturated nature of the ground close to the river, but there are signs of some recovery (Photo 3).

The RoW going west towards the OPF is structurally sound with the slope breakers being in good condition and some signs of vegetation recovery (Photo 4).

Photo 1 – Reno mats and river bank condition

Photo 2 – East bank condition and drainage

Photo 3 – West bank RoW adjacent to river

Photo 4 – West bank RoW away from river

KP 148.5 to 156 RoW

This is the access road from the OPF to NOB-24 running through a mixture of low lying peat areas and sandy raises. The road also includes the crossing of the Orkunie river at KP151.3 (see map).

The access road is in good condition and well maintained but there are areas of the RoW that will require attention. In the peat bog areas it is apparent that one side of the access road is drier than the other (Photos 1 and 2). This implies an interference of the groundwater and surface water flows across the access road. Should monitoring of the vegetation recovery show large anomalies between the two sides over the next year, it would be recommended that more cross road drainage be installed to enhance the flows and equalise the water levels. Some subsidence over the pipelines was noted within the peat areas with one notable hole having opened up at KP 151.8 (Photo 3).

The sandy areas along the road again show the poor recovery of the vegetation noted elsewhere on the RoW. This is leading to silt and sand washing out, and in places build up and over-topping of the slope breakers (Photo 4) preventing them from functioning properly and leading to silt build up in some of the streams (Photo 5). In the short-term there is a need for the slope breakers to be cleaned out and new silt fencing to be installed, while in the long-term the re-vegetation of the RoW to prevent silt scour needs to be addressed.

The bridge placed over the Orkunie river to allow permanent access to NOB-24 is in good condition as are the banks of the river where rip-rap is holding well (Photo 6). However, it was noted that there is no silt protection either on the running area of the bridge or on the parapets which, combined with the open slats between the wood, has the potential to lead to material dropping into the river during vehicle transit. It is recommended that geotextile is placed on the bridge and a form of silt fencing lining the edges. Other smaller crossings were noted to have silt fencing in a poor state of repair (Photos 7 and 8) – it is recommended that these are replaced.

Photo 1 – South road RoW dry	Photo 2 – North road RoW wet
	

Photo 3 – 1m hole over pipeline KP 151.8

Photo 4 – Over-topped slope breaker

Photo 5 – Silt running into river

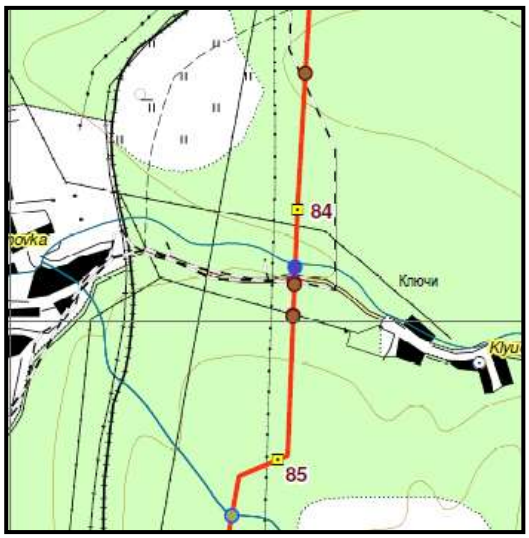
Photo 6 – Bridge over Orkunie River

Photo 7 – Damaged silt fencing

Photo 8 – Damaged silt fencing

KP 84.2 Voskresenka River

KP 84.2 is small river crossing in low-lying undulating terrain just to the east of the village of Voskresenka (see map).



The river bank is in good condition with Reno mats on both banks holding well and showing the start of silting (Photo 1), the river is clean gravel and looks to be in good condition (Photo 2).

The RoW is showing reasonable grass growth in the low lying areas (Photo 3) although this will require some attention in the form of continued fertilisation to ensure improved growth over the next few growing seasons. On the higher ground the growth is not so good (Photo 4) and there will be reseeding required in some of these areas, although the slope breakers were noted to be in good condition and working well. It was noted that the safety warning signs at this road crossing had been removed and that there was evidence of unauthorised access onto the RoW (Photo 5).

Photo 1 – Reno matting in good condition

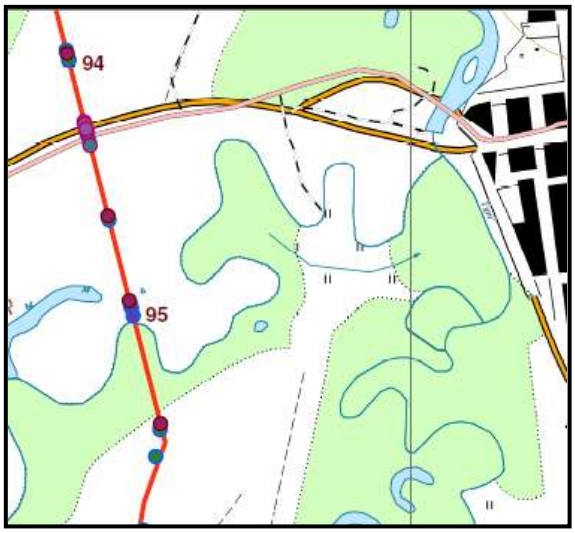
Photo 2 – Clean river bed gravel

Photo 3 – Good vegetation recovery

Photo 4 – Sparse vegetation on upper slopes

Photo 5 – Unauthorised access onto RoW

KP 95 Tym River



A river crossing in the flat area of the flood plain to the west of Tymovskoe (see map).

The northern bank of the river (outside curve of the meander) is protected by gabions, although these have been over-topped during flood events. These are in good condition and are starting to show vegetative growth through them (Photo 1). The southern bank has Reno matting now covered in silt and is also showing natural re-vegetation (Photo 2). At the time of the visit there were no concerns over the river bank condition at this crossing.

Re-vegetation along the RoW is good where the river flood has deposited silt (Photo 3) although this does become patchier further away from the banks. A bund had been constructed as part of the original RoW protection work – this is no longer effective and has been over-topped during recent flood events (Photo 4). It is recommended that the remains of the coco matting are removed from this structure and the river allowed to redistribute the gravel and other bund material naturally during future floods.

Photo 1 – Gabions on north bank

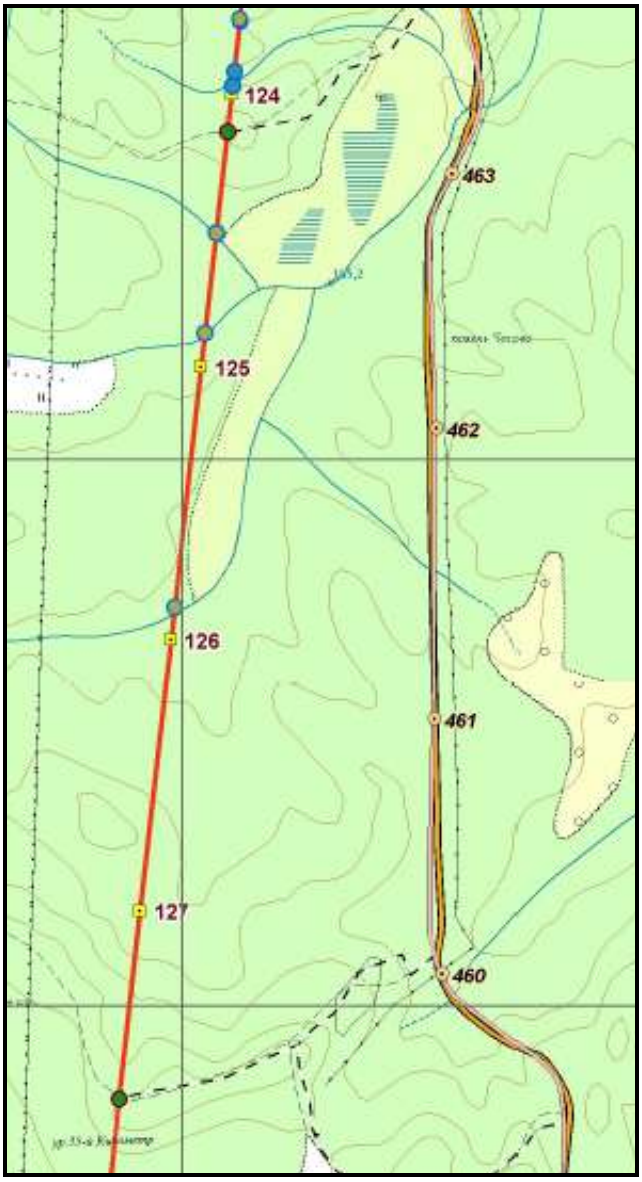
Photo 2 – View to south bank

Photo 3 – Re-vegetation on north bank

Photo 4 – Damaged bund on north bank

KP 124 to 127.7 Sandy Slopes

The RoW runs through an area of undulating sandy hills interspersed with low-lying peat-rich areas (see map).



This area had been a problem during the construction period with wash-outs and erosion difficult to control. It was noted during this visit that the slopes had held up reasonably well with the slope breakers still in place and some signs of grass growth, particularly on the lower slopes (Photos 1 and 2). However, in common with the other sandy areas visited, there was evidence of erosional features with erosion rills formed in areas of barren growth (Photo 3), and silt and sand build up behind slope breakers (Photo 4) that could lead to over-topping and scour where the run-off has built up (Photo 5).

The sparsely vegetated areas of the slopes will need further re-seeding and fertilisation to try and create a long-term solution to the erosion, while in the short-term repairs and maintenance will be required for the engineered areas of the slope. It was noted that grass had grown in areas where previous erosion had occurred (Photo 6) and this seemed to have stabilised the movement of materials.

Photo 1 – Slopes looking north to TOB-11

Photo 2 – Photo looking south

Photo 3 – Erosion rills in barren soil

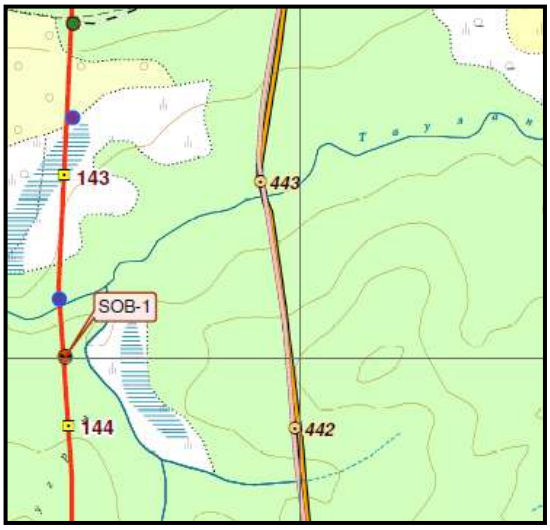
Photo 4 – Silting of slope breaker

Photo 5 – Scour behind slope breaker

Photo 6 – Old erosion feature overgrown

KP 143.4 Taulyanka River

A river crossing in an area of low undulating topography with many peat-rich sections (see map).



The RoW into the river is generally wet with much peat in the soil and, as such, has had a good vegetation recovery with much local re-vegetation taking place (Photo 1). The higher ground areas to the north of the river are also showing good growth recovery, although these areas may still require some aftercare to ensure sufficient nutrition is available for continued development (Photo 2).

The river crossing was in good condition with both banks showing a good build up of silt cover following flooding, to a depth of 30cm over the Reno mats placed during construction (Photo 3). There was a good vegetation covering, particularly of clover, just back from the river banks (Photo 4). The crossing was in good condition.

Photo 1 – RoW General view south to river

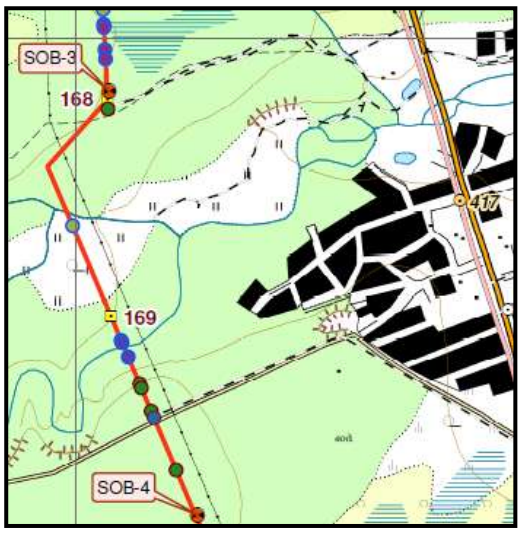
Photo 2 – RoW General view north

Photo 3 – Silted river banks

Photo 4 – Clover growth near river bank

KP 168.6 Onor River

A river crossing at the base of a gravelly hill on the western outskirts of Onor town (see map).



The slope down to the river was sparsely vegetated (Photo 1) but was holding well with the slope breakers in good condition (Photo 2). Further work is going to be required to encourage and maintain growth on the slopes, it was noted that clover, rather than grass seemed to be establishing better.

The river banks were both in good condition with the Reno matting holding well and starting to show signs of natural re-vegetation showing through (Photos 3 and 4). The river was running clean and the river bed looked to be in good condition.

One area of slight subsidence was noted over the pipeline to the east where the Reno mats had settled by some 30 to 50cm (Photo 5), this will require some repair and maintenance.

Photo 1 – Barren slope down to the river

Photo 2 – Slope breaker in good condition

Photo 3 – Northern bank re-vegetation

Photo 4 – View to southern bank

Photo 5 – Subsidence over the pipeline

KP 174.4 Pyataya Rechka River

The southern slope running down towards the river is engineered with slope breakers and central and side drainage gullies to manage and channel water off the RoW (Photo 1). Drains channel water down the slope and then across to a holding pool at the edge of the RoW for filtration and low velocity release into the forest (Photo 2). This appeared to be working well.

Vegetation on both the upward slope from the access road and the downward slope to the river is generally poor. Both established and new grass growth is evident on the wetter parts of the slope (edge of the RoW, lower-lying areas and drains, Photos 2 and 4), although higher ground is notably dry, rocky and barren (Photo 1). The overall revegetation situation is significantly worse than that noted in 2008 and additional reseeding is recommended in these areas.

A wet area on the southern river bank was already secured with coco matting and a silt fence erected to prevent sediment running into the river. Sakhalin Energy should keep the silt fence in good repair and encourage the vegetation in this area with further seeding.

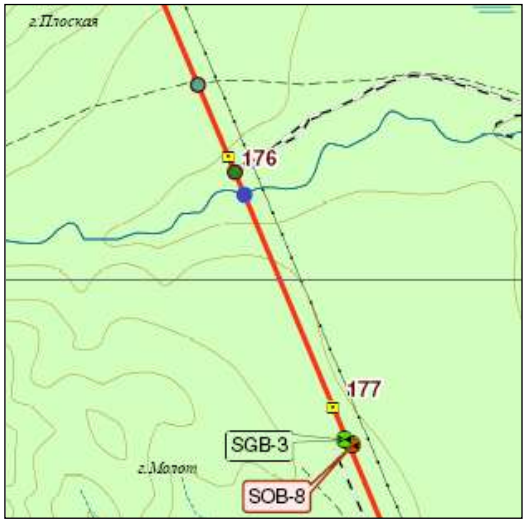
Photo 1 – Central drainage, southern slope

Photo 2 – Slow, filtered drainage to forest

Photo 3 – Slope south of access road

Photo 4 – Repairing silt fencing

KP 176.2 Sedmaya River



The RoW crosses the river just upstream of a small meander, shown in Photo 1. Both banks are protected with Reno mats – these are in good condition although remain unvegetated at present. Vegetation on the southern slopes is patchy although new growth is encouraging (Photo 2). Vegetation on the slopes north of the access road was not quite as established with bare areas north of KP 176, shown in (Photo 3).

Some undercutting of the southern river bank was noted upstream of the river crossing, just off the RoW (Photo 4). Riprap is currently protecting the Reno mats, and while this is not currently an issue the bank should be monitored to ensure that this does not get any worse with the river potentially cutting behind the Reno mats.

In addition, locals appear to be using the RoW, as indicated by a cut tree spanning the river to the right of Photo 4 and the missing signage noted in Photos 2 and 3 (and many other locations). Sakhalin Energy should continue to note any unauthorised use of the RoW and take appropriate action if this becomes a problem.

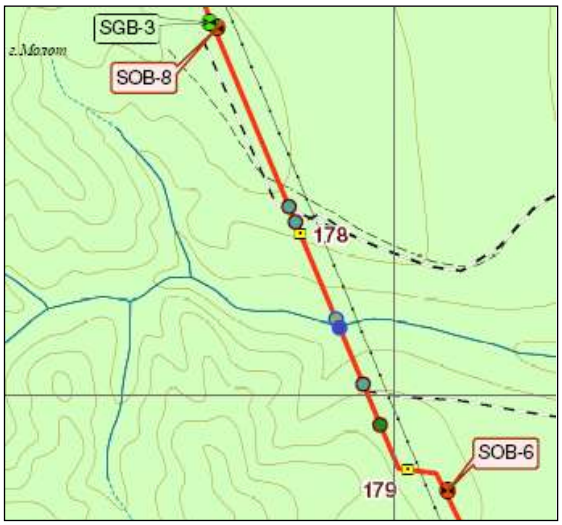
Photo 1 – Meander, towards southern bank

Photo 2 – Southern slope

Photo 3 – Slopes north of access road

Photo 4 – River undercutting southern bank

KP 178.4 Devyataya River



The area adjacent to the BVS was particularly muddy, with erosion rills and preferential channels forming across the RoW (Photo 1).

Vegetation was patchy and variable, with some areas showing promising new growth (albeit sparse) and others very little. Little new growth was noted near the BVS (Photo 2) however a healthy patch of seemingly native new vegetation was noted near the edge of the RoW. It is possible that this species is tolerant to these limited growing conditions, and Sakhalin Energy should explore whether this species can be encouraged across more of the RoW. More vegetation was noted towards the river and along the tops of the Reno mats (Photos 3 and 4).

The main engineering aspects of the slopes and river were good – slope breakers were well placed and well maintained, and coco matting armour remained in place. Reno mats guiding the small meander in the river were in good condition (Photo 5). Silt deposition and debris showing the high water line was evident along the Reno mats; early signs of revegetation were starting to show however this will take some time.

A hole measuring ~ 1 x 0.5 m was noted at the edge of the southern slope of the RoW, at approximately KP 178.8. Layers of cut logs placed on the RoW during construction (parallel to the pipeline, possibly for vehicle platforms) had been uncovered, showing a water-filled gap beneath. Construction debris should have been removed from the RoW and it is recommended that these logs are removed and the hole backfilled. It should be noted that the integrity of the pipeline is not under threat.

Photo 1 – Erosion rills & preferential channels

Photo 2 – Little new growth near BVS

Photo 3 – Looking towards northern slope

Photo 4 – Revegetation along southern bank

Photo 5 – Reno mats guide the meander

Photo 6 – Hole under RoW

Fault Crossing 7

As an additional RoW location, Fault crossing 7 was visited briefly. The side cuts are thought to have previously been hydro-seeded, and evidence of old and new vegetation was noted (Photo 1).

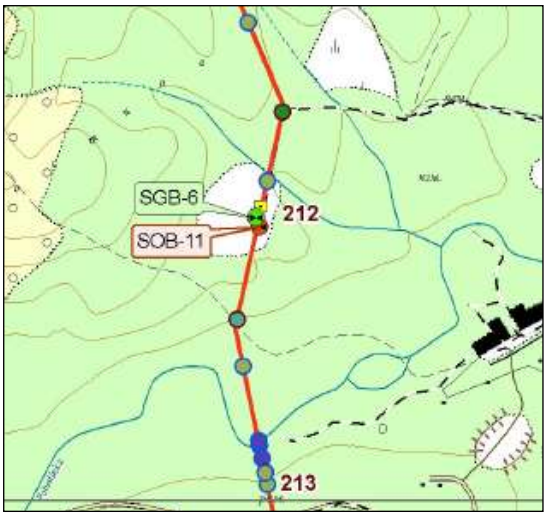
The original RoW (to the right of Photo 2) was very sparsely vegetated, with very poor topsoil and only a few shoots. AEA understands that the original RoW – land cleared prior to re-designing the Fault Crossing route – will be reforested back to its former state, although there was no evidence at Fault 7 to suggest that this had started yet.

In addition, the gates securing the highly engineered fault crossing had been stolen – these should be replaced at Sakhalin Energy's first opportunity to ensure the security of the site.

Photo 1 – Revegetation on side cuts

Photo 2 – Original RoW – sparely vegetated

KP 212 Pobedinka River



Revegetation at the Pobedinka River was notably more established than at previously visited locations in the north. The ground adjacent to the access road was wetland, with better quality, more nutrient-rich topsoil. As a result, re-vegetation was advanced with a variety of grasses and plants. Vegetation along the outside of the RoW had been established for three years, while the central strip (a temporary access road) had recently been reinstated and reseeded. (Photos 1 and 2)

The southern bank of the Pobedinka River has been re-engineered on many occasions over the past three years. The current stabilisation measure is a three-tier gabion wall that runs the width of the RoW (Photo 3). During this visit, the gabion wall was noted to have been pushed forwards toward the river due to pressure from the slope behind. A distinct bulge could be seen in the shape of the wall, and the rip-rap backfill has fallen into the gap, exposing the textile behind (Photo 4). Sakhalin Energy will need to empty, straighten, re-pack and re-tie the baskets into position again. A few minor repairs are required to other baskets. However of greater concern is the fact that the river bank stabilisation is requiring attention every year; should this continue, Sakhalin Energy may need to reconsider the riverbank engineering strategy at this location.

Undercutting of the upstream, outer bank of the river should also be monitored at this location. Evidence of this is shown in Photo 5 – trees have collapsed into the river as ground underneath has been washed away. Undercutting presents a threat to pipeline integrity should the river erode behind the gabion wall. It is recommended that Sakhalin Energy considers requesting permission to work upstream of the RoW to reinforce the outer curve of the river bank.

The newly-laid drain downstream of the pipeline is working well (Photo 6), which now channels run-off directly to the river rather than allowing it to run behind the gabion wall.

Photo 1 – RoW

Photo 2 – Established vegetation along RoW

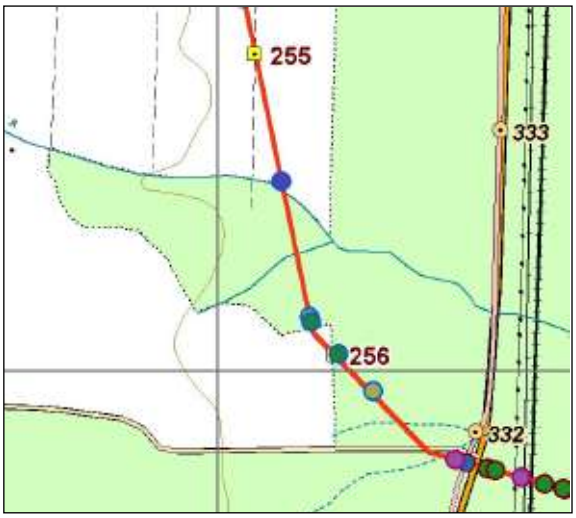
Photo 3 – Gabion wall

Photo 4 – Gabion pushed forwards

Photo 5 – River undercutting outer bank

Photo 6 – Newly laid drain

KP 255.7 Nizhny Kamenka River (Matrosovka River)



The Nizhny Kamenka River is a meandering river which has its changed course many times. As a result, the pipeline is buried deeper across the entire meander plane. The main channel is currently on the southern side, rather than the northern side which is protected by a gabion wall.

Spring thaw debris was visible on the central island (Photo 1). The southern bank Reno mats require a little maintenance following the spring thaw – some had broken open and some slumped into the river (Photo 2). Repair work is reportedly on Sakhalin Energy's list of 2010 activities, and will probably be undertaken during October.

Although the topsoil is poor, vegetation was reasonable by the access road (Photo 3) – cows noted on the RoW will be helping to transfer seed and provide additional nutrients to the soil. Vegetation was not so good towards the river banks, and the river remains protected on the southern bank by silt fences (Photo 2) – these should remain until vegetation on the river banks becomes more established.

Photo 1 – High water debris on river bank

Photo 2 – Reno mats require maintenance

Photo 3 – Vegetation and animals on RoW

KP ~276.6 Unnamed Stream near Leonidovka River

Access to the Leonidovka River was not possible as the river level of the unnamed stream between the BVS (POB-3) and Leonidovka was too high to cross.

The Leonidovka underwent major engineering works during early 2010, which were completed mid-April. This unnamed stream had been crossed by heavy vehicles en-route to the Leonidovka, and still showed the damage caused by such works. The running track was still in place and stream's river banks need to be reinstated at the crossing (Photo 1). According to Sakhalin Energy, the soil in the river will be dragged out quickly using an excavator. AEA considers this to be 'in-stream works' – as the river is likely to be a tributary to the Leonidovka (which has significant salmon spawning habitat downstream of the crossing) Sakhalin Energy will need to give appropriate consideration to the timing of this exercise, either waiting until the salmon spawning season has finished, or creating a diversion path for the river while excavation works are going on in the main stream channel.

In addition, left-over large riprap and mats left on the edge of the RoW need to be removed from a housekeeping point of view.

The river banks were silted with evidence of new growth starting to come, although this will take some time. Revegetation was good on the stretch between the BVS and the stream (Photo 3).

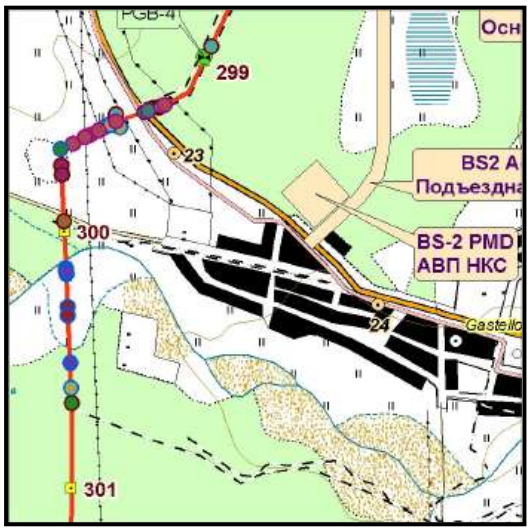
Photo 1 – Running track and river bank damage

Photo 2 – Silted riverbanks

Photo 3 – Vegetation on RoW

KP 300 Gastellova River

The Gastellova River in this location is a high energy braided river that can change channels and form new channels during high flow.



The Gastellova River experienced high flow rates following the typhoon of autumn 2009. This resulted in damage to bank protection of southern bank of the northern channels. Sakhalin Energy performed emergency repair during the later parts of 2009 to reinstall bank protection on the south bank. During the current visit it was impossible to cross the river and view the south bank. According to Sakhalin Energy, more work is scheduled to be performed following the spawning season this year. The repaired south bank is partially visible from a distance (Photo 1). The north bank of the north channel was not impacted and the Reno matting is intact.

Photo 1 **–** View to the south bank

Photo 2 **–** View of the north bank

KP 303.8 Kissa River and Fault Crossing 9

The Kissa River is protected with Reno matting on both banks and with silt fencing at the top of the banks (Photos 1 and 2). The Reno matting at the upstream corner is being undermined by the flow and will need to be monitored (Photo 1). Vegetation at the site is spotty and in need of further seeding.

Fault crossing 9 was walked through on the way to the Kissa. The side cuts were hydro-seeded but currently do not have full coverage and could use additional bio-restoration (Photo 3). At other side cut there was a failure behind the geotextile which will require repair (Photo 4).

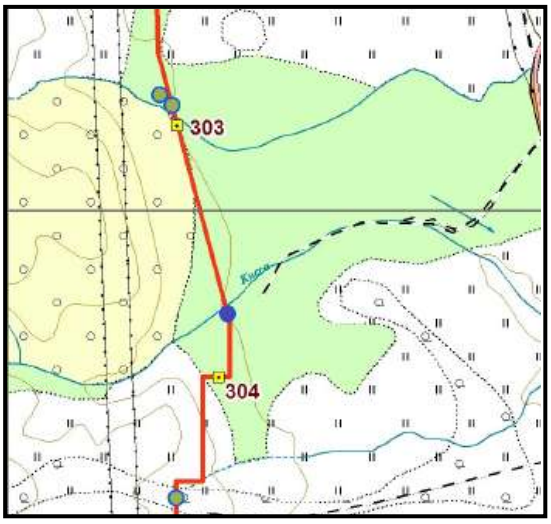


Photo 1 – Matting with damage – bottom right

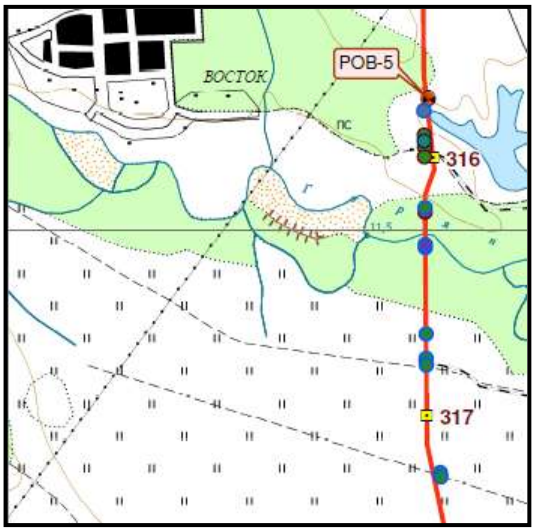
Photo 2 – View of Reno matting on banks

Photo 3 – Fault crossing side cuts

Photo 4 – Failed site cut

KP 316.4 Goryanka River and adjacent RoW

The Goryanka is a wide meandering river. At the time of the visit it was already below its flood level but still with high flow. The river banks are protected with Reno matting which held well during the thaw flow.



The northern bank is developing a natural gravel bank deposit on top of the matting (Photo 1). The southern bank is intact however some bank erosion is developing upstream of the crossing adjacent to the matting and will require future maintenance (Photo 2). Very sparse vegetation is present on both banks. The RoW in the flood plain has good vegetation cover, however south of the crossing on the slopes away from the river the vegetation cover is poor (Photo 3).

A washout was observed on the RoW side between the river and the BVS to the south (Photo 3). This was noted by the Company and explained to be at the access point to the pipe trench drain cleanout. Photo 4 demonstrates a recurring problem of theft of pipeline signage along the RoW.

Photo 1 – Natural gravel bar on Reno mats

Photo 2 – Erosion developing upstream

Photo 3 – Wash out at a clean out drain

Photo 4 – View of ROW and lack of signage

KP 326.6 Nitui River

The Nitui River is a high energy, multi channel, braided river. During the typhoons in late 2009 both the north and south channel protection suffered heavy damage, and in some places pipe line was exposed. Sakhalin Energy conducted emergency repairs at the end of the typhoon season and more work is scheduled to be conducted this year following the spawning season.

At the time of the visit there was heavy riprap on the northern bank of the south channel and some on the inside band (Photos 1 and 2), and the washout on the pipe was repaired. Photo 3 was taken just east of the crossing of the north channel (no access was possible at the time of the visit) and illustrates the multi channel braided nature of the river.

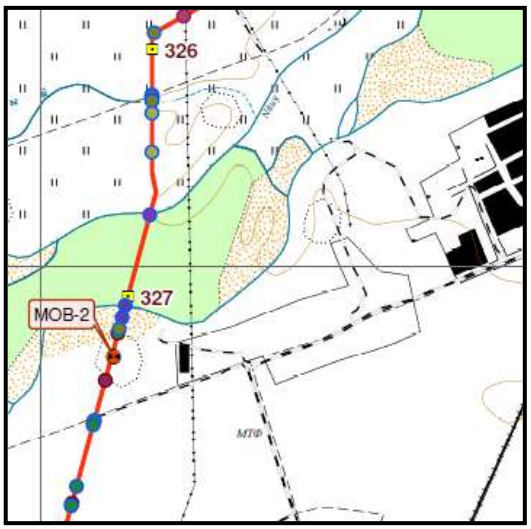
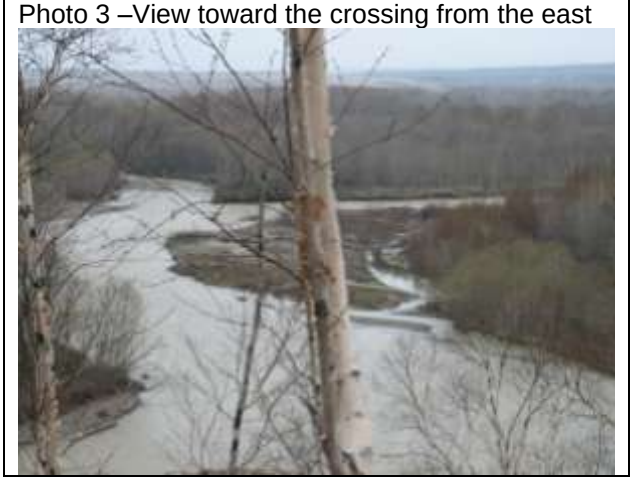


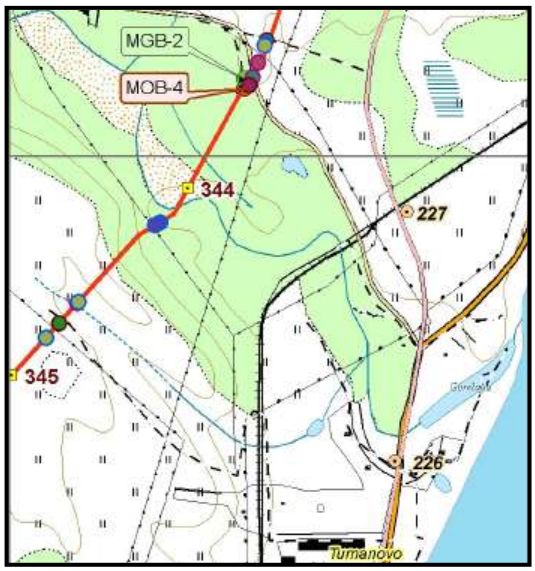
Photo 1 – View to the far bank with riprap

Photo 2 – View to the upstream

Photo 3 –View toward the crossing from the east



KP 344 Gornaya River



The Gornaya is a large meandering river with a very tight meander just upstream of the crossing. During the typhoons of June/July 2009, the river jumped the bank following a blockage of the main channel. Its path short-cut the bend, and began flowing across the RoW outside of the channel. Both the gas pipeline and FOC became exposed and critical spawning habitat was compromised, so was treated as an emergency. Sakhalin Energy conducted extensive emergency repairs at the site which included fortifying the channel bank upstream of the crossing (Photo 1) and constructing a fortified overflow channel across the RoW north of the present channel (Photo 2). Reportedly, this will allow flood water to cross the RoW in a controlled manner.

The outside bank on the original channel has gabions and was not impacted by the flooding (Photo 3) the slope south of the river appears intact but with sparse vegetation. The RoW north of the crossing has very little vegetation and much un-germinated seed was observed on the ground (Photo 4).

Photo 1 – Fortified meander bank upstream

Photo 2 – Overflow channel

Photo 3 – Gabion wall on the south bank

Photo 4 – Un-germinated seed

KP 346.5 Vidnaya River

The Vidnaya River has a very steep slope and consists of poorly consolidated material above the south bank.

During the visit it was observed that although the slope held during the spring thaw there was significant erosion starting at different parts of the slope with a resulting sediment flow to the river below. Deep rills and washouts were observed where the drainage control was not adequate. In addition, the slope was almost devoid of vegetation.

The river banks are protected by Reno matting and were intact. The silt fencing was effective in capturing some of the sediment flow from the slope. The main issues at this location are erosion and drainage control and bio-restoration on the steep slope (Photos 1 to 4).

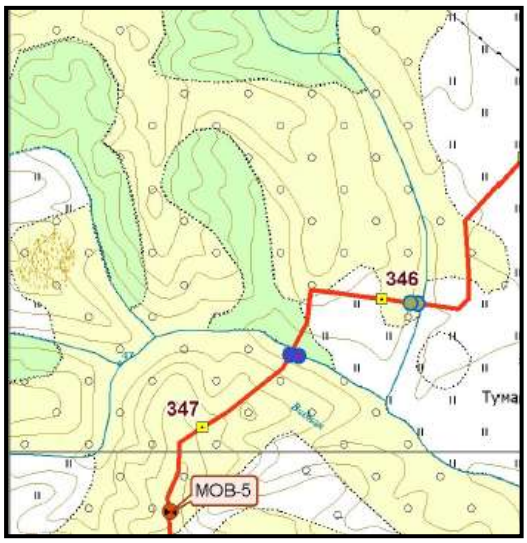


Photo 1 – Slope south of the river

Photo 2 – Erosional rills on south slope

Photo 3 – washout under a slope breaker

Photo 4 – Erosion of slope above the river

KP 348.8 Gar River

The Gar River crossing was damaged during last year's typhoon and required emergency repairs following the rains. The Reno matting on both banks and river bed were repaired (Photo 1). However, the work was not completed and more is scheduled to be done this year following the spawning season.

The south slope held during the typhoons and this year's thaw but some repairs are required for the drainage system – particularly the vertical drains (Photo 2). The northern slope held but was disturbed by heavy equipment movement during the emergency repairs. Slope breakers were restored at the time of the equipment pullout but they need a more permanent repair (Photo 3).

Vegetation on both slopes is sparse and particularly on the south slope this increases the likelihood of slope erosion.

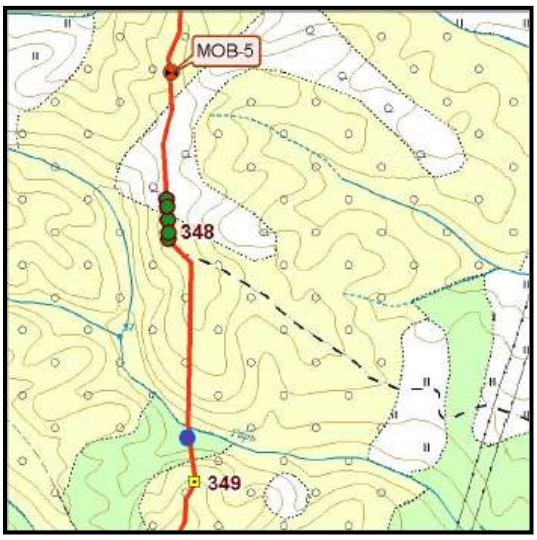


Photo 1 – Reno matting on river banks

Photo 2 – View of southern slope

Photo 3 – View of northern slope - slope breakers

KP 351 Khormovaya River

The Khormovaya River has very steep slopes on both banks. The north slope is also a part of a fault crossing.

During the visit it was observed that the south slope has generally good surface run-off control but is almost entirely devoid of vegetation (Photos 1 to 3). Also, a significant sized failure was observed at mid slope (Photo 2). The north slope showed evidence of sediment flow to the river along the side cuts. The surface of slope as well the side cuts (which are covered with geotextile) show no vegetation.

The river banks are well protected by gabion walls which held well during the typhoons and the spring thaw (Photo 4). The failure on the south slope indicates a need for better surface and subsurface drainage control. Further bio-reinstatement is also necessary to further stabilise the slopes and reduce sediment transport to the river.

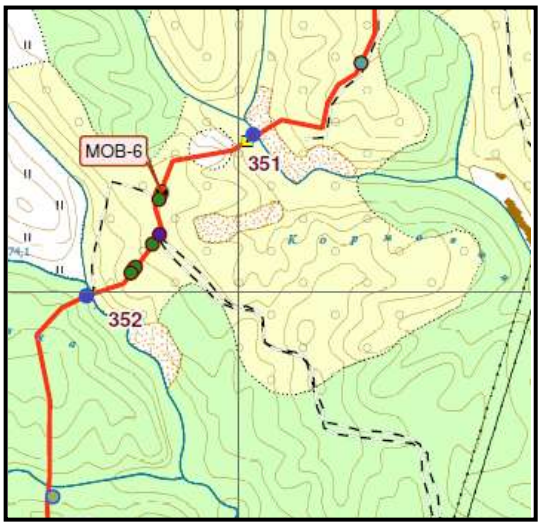


Photo 1 – View of the upper southern slope

Photo 2 – View of a slope failure at mid slope

Photo 3 – View of the southern slope lack of vegetation

Photo 4 – View of the slopes and gabions on river banks

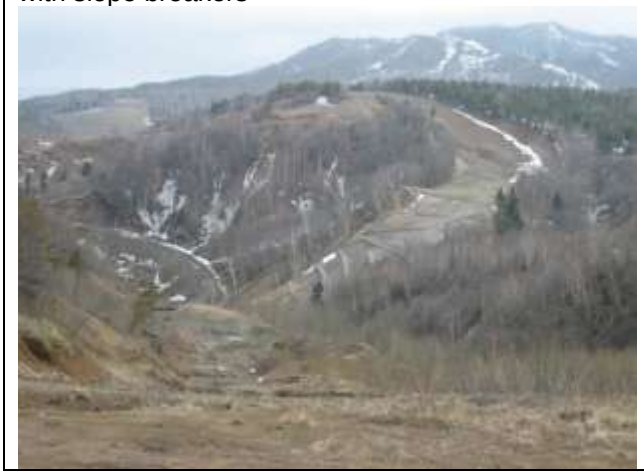
KP 352 Krinka River

The Krinka river banks are protected with extensive Reno mats and silt fencing. The mats and the fences appear to be in good shape. The northern slope is heavily vegetated and with good drainage control and slope breakers. The southern slope held during the typhoons and the thaw but shows significant rills and a lack of vegetation on the slope surface and on the side cut (Photos 1 to 3).

Photo 1 – Reno mats on river, and erosion and lack of vegetation on south slope

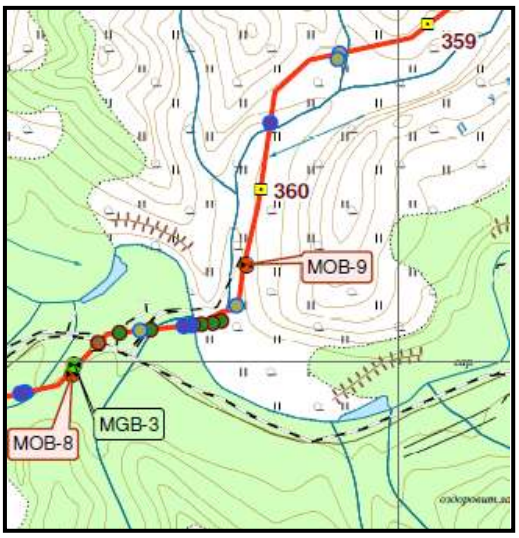
Photo 2 – View of both slopes and river showing good vegetation on near slope

Photo 3 – View to the south at the long south slope with slope breakers



KP 360.4 Makarova River

The Makarova River is a wide, high energy river which during typhoons and springs thaw flows with high volume and power. The bridge was removed prior to the thaw but the work is not completed. The foundation on the north bank is still in place and is scheduled to be removed later this year.



The river bank protection consists of gabion walls on both banks. The north bank gabion wall is damaged at the upstream point and will need repair (Photo 2). The RoW on the north side has a running track leading to the BVS (Photos 1 and 2). Reportedly, the running track will be removed and the slope will be reinstated. The gabion wall on the south bank is intact; however the bank and the RoW to the south have construction debris and a temporary road (Photos 3 and 4). All this is reportedly scheduled to be removed following the spawning period. Vegetation on the RoW to the south is good, and the north RoW will need to be seeded when the slope is reinstated.

Photo 1 – View north across the river showing running track

Photo 2 – Damaged gabion wall and bridge foundation

Photo 3 – South bank gabion wall and construction debris

Photo 4 – South bank and unfinished ground works

KP 361.4 Solyanka River

The Solyanka River banks are still covered with small riprap that was installed during construction. Since then, some of the riprap has been lost during high flows. Also, the bridge foundation is still visible in the north bank (Photos 1 and 2). Reportedly, the river is scheduled for installation of new bank protection and removal of the bridge foundation.

The gabion protected channel upstream of the crossing and parallel to the RoW was damaged during the typhoons of last year was repaired on an emergency basis last year (Photo 3). More work is scheduled to be performed upstream of the repaired area (Photo 4).

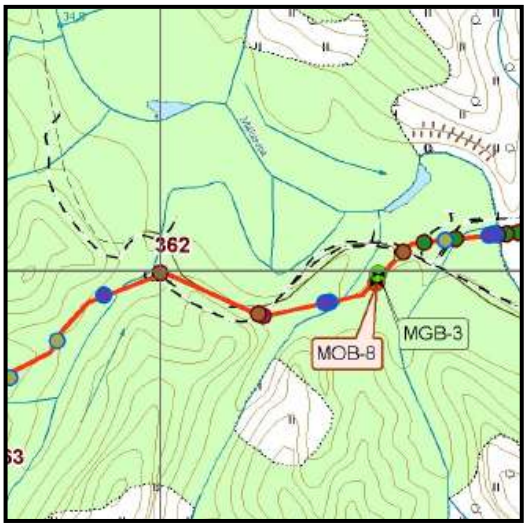


Photo 1 – River with bridge foundation and riprap

Photo 2 – View of river and tributary

Photo 3 – Repaired channel

Photo 4 – Upstream of repaired channel at future planned works

KP 362 Sosnovka River

The Sosnovka River crossing includes the river and an adjacent tributary. The river is protected with gabion walls on the banks (Photo 1) and the tributary with riprap (Photo 2).

The RoW in the vicinity of the crossing is in need of additional seeding (Photo 3). The area where the RoW is crossing a forestry road is disturbed and in need of additional grading and seeding (Photo 4).

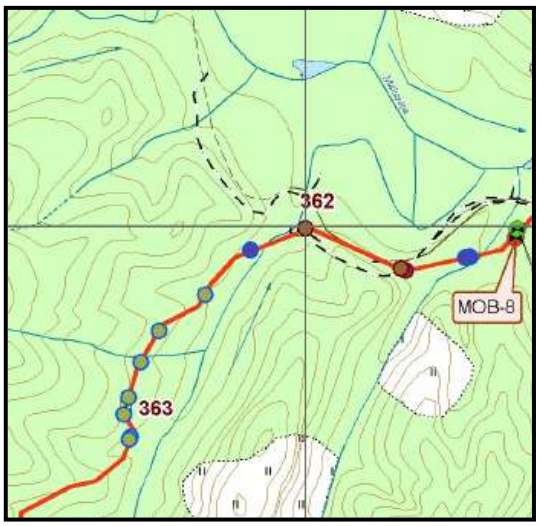


Photo 1 – Downstream of river – gabion walls

Photo 2 – Fortified tributary crossing the RoW

Photo 3 – Lack of vegetation on RoW

Photo 4 – View of disturbed RoW

KP 369.6 Pegas River

The Pegas River crossing is protected with gabion wall on each bank and the RoW is well vegetated. The slope above the BVS is protected with slope breakers but in need of additional seeding.

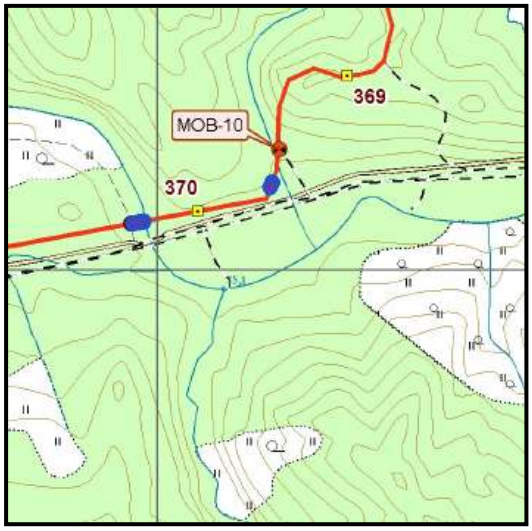


Photo 1 – View of river with gabion walls

Photo 2 – View of the northern slope

KP 370.2 Lesnaya 1 River

The Lesnaya 1 River crossing is protected by gabion walls on the outside bank of the meander (north bank – Photo 1) and by Reno matting on the inside bank of the meander (south bank – Photo 2).

Both banks are in a good state and vegetation is starting to take hold on the Reno mats. The RoW on both sides of the river is well vegetated.

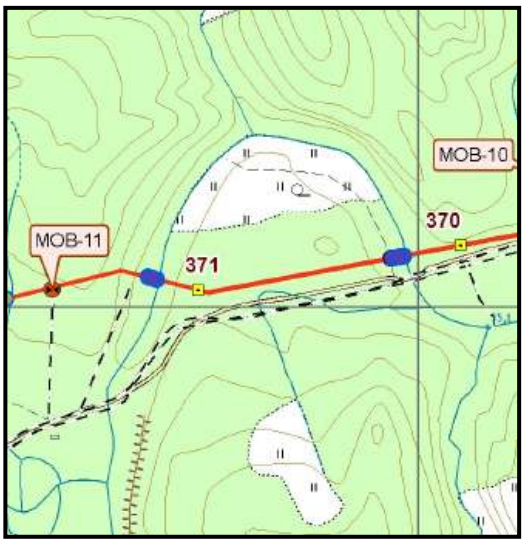


Photo 1 – View to north of gabion wall and RoW

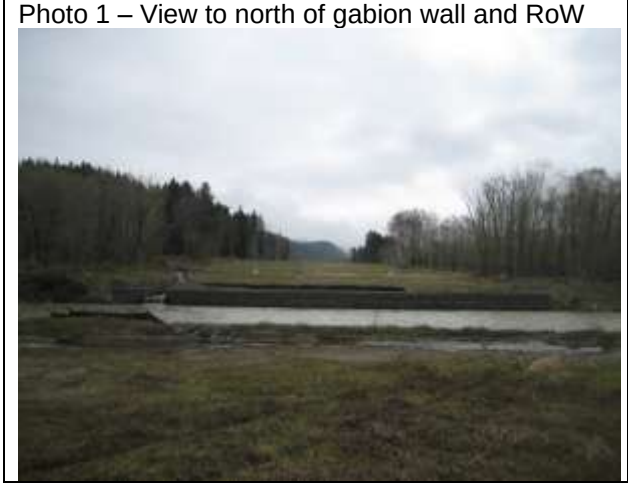


Photo 2 – view of Reno mats on the south bank

KP 371.2 Lesnaya 2 River

The Lesnaya 2 Crossing is constructed similarly to the Lesnaya 1 crossing – gabion wall on the bank of the outside bend, and Reno matting on the bank of the inside band. Both are in good condition (Photos 1 and 2).

The RoW slope on the south side of the river is well protected and vegetated. The RoW on the northern side has a short slope with good vegetation (Photos 3 and 4).

Photo 1 - View to north of Gabion wall and RoW

Photo 2– Reno mats on the south bank

Photo 3 – Vegetation on RoW

Photo 4 – View of vegetation on RoW slope

KP 373 Madera River

The Madera River crossing was damaged in last year's typhoons and repaired on an emergency basis. Currently, the river is protected by a gabion wall on the south bank and Reno mats on the north bank (Photos 1 and 2). The upstream corner of the gabion wall and the adjacent natural bank will need to be monitored.

The RoW on both sides of the river have good vegetation cover, however the slope further south has spotty cover and some soil instability (Photo 3). More seeding is needed on the slope and a continuous monitoring of the slope condition.

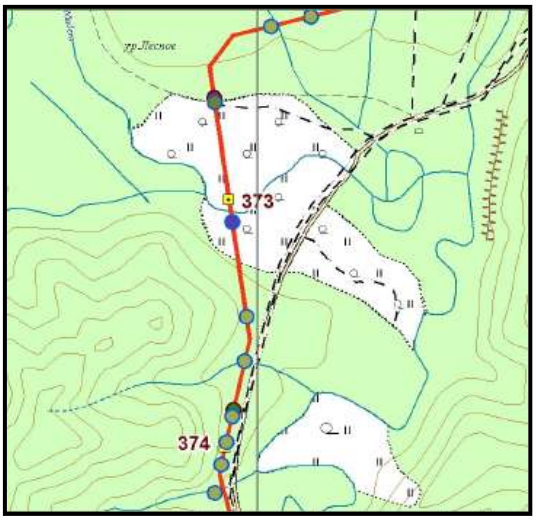


Photo 1 – South bank gabion wall

Photo 2 – RoW vegetation

Photo 3 – Soil instability on south slope

KP 376 Zhelezhnyak River

The Zhelezhnyak River crossing was damaged during last year's typhoons and was repaired last year as an emergency operation. Currently the river banks are protected with gabion walls on both sides of the river (Photos 1 and 2). The slope south of the river is well vegetated (by hydro-seeding) and held well (Photo 3).

The RoW on the north side is partially disturbed, probably due to the emergency, works and is need of reinstatement (Photo 4).

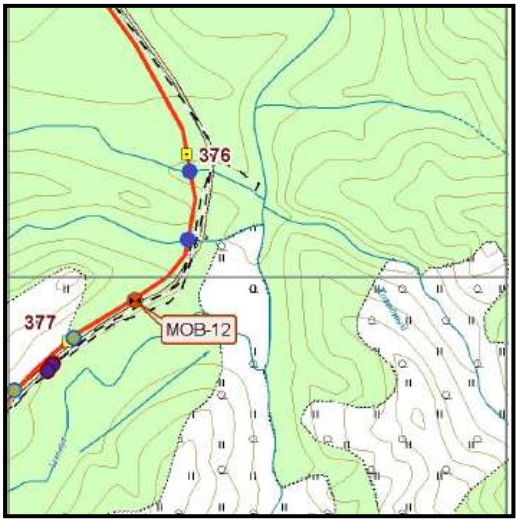


Photo 1 – Upstream of repaired gabion walls

Photo 2 – Downstream of repaired gabion walls

Photo 3 – South slope with good vegetation

Photo 4 – View north at RoW across the river

KP 380.6 Lesnaya 3 River

The Lesnaya 3 River crossing is well protected with gabion walls and Reno matting on both side of the river (Photos 1 and 2).

The slope on the south side is very steep and at the time of the visit was partially covered with snow. Soil movement was observed at about mid slope on the gas pipe side (Photos 3 and 4). Reportedly, Company personnel have noted the condition of the slope and added it to the maintenance schedule.

The slope also has very limited grass cover and is in need of further bio-restoration.

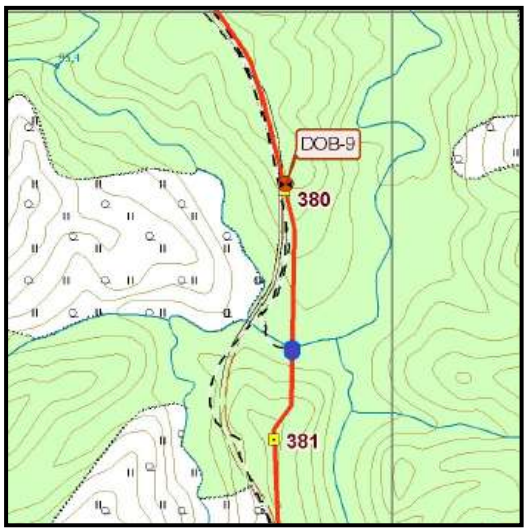


Photo 1 – View to the downstream

Photo 2 – View to the upstream

Photo 3 – View south at the slope across the river

Photo 4 – Soil movement at mid slope

KP 384.5 Lazovaya 1 River

The Lazovaya 1 River crossing is protected with gabion walls on each bank (Photos 1 to 3).

The slope above the river on the north side held during the thaw and is protected with slope breakers. However, it has very minimal vegetation cover and is need of a further seeding (Photo 3).

As seen in the photos below, the bridge and the running track are still in place. Reportedly, the bridge is scheduled to be removed and the running track reinstated.

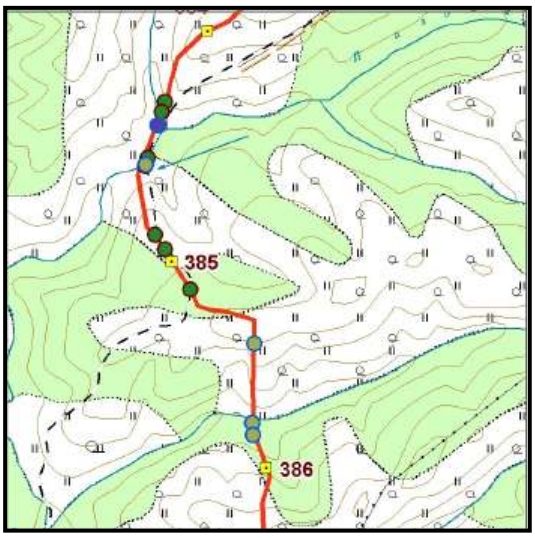


Photo 1 – View to the south across the river

Photo 2 – Downstream – bridge and gabion walls

Photo 3 – Downstream – bridge and gabion walls

KP 387.3 Sedlet River Slopes and Spoil Tip

The Sedlet River crossing was not reached due to access limitations. At the top of the northern slope of the river, there was (during construction) an unauthorised spoil tip. The spoil tip was since removed and the soil was placed in an authorised spoil tip elsewhere. However, the area left behind was not reinstated properly and soil creep and erosion are evident (Photo 1). The state of the site was noted by the Company representatives.

On the RoW itself, at the top of the northern slope there was a slope failure to western side of the RoW (Photo 2). This too was noted by Company representatives. The opposite slope appears intact and is protected with slope breakers (Photo 3). Both slopes are in need of further seeding.

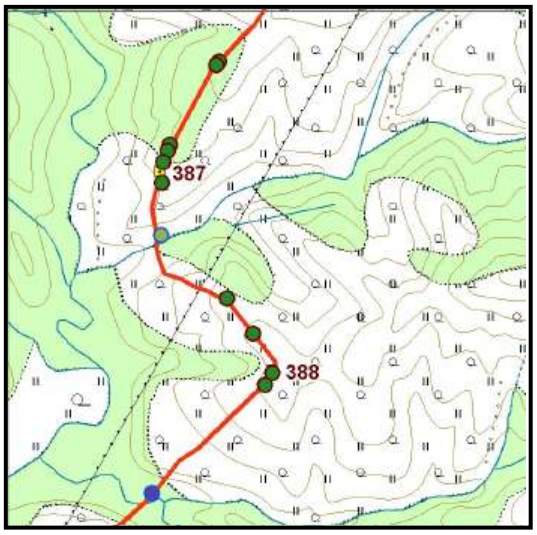


Photo 1 – Remains of spoil tip and rill build up

Photo 3 – View at failed ROW slope

Photo 4 – View to the south at slopes across the river

KP 414 and 415 RoW and unnamed stream

The RoW leading to the stream is mostly in good shape but in need of further seeding. As seen in Photos 1 and 2, the grass cover on the RoW is very inconsistent – in this case it is good on the opposite slope and poor on the near slope. The un-named stream is well protected with riprap and silt fencing (Photos 1 and 2). At approximately KP 415 the RoW is less vegetated and with some soil movement on the side cuts (Photo 3).

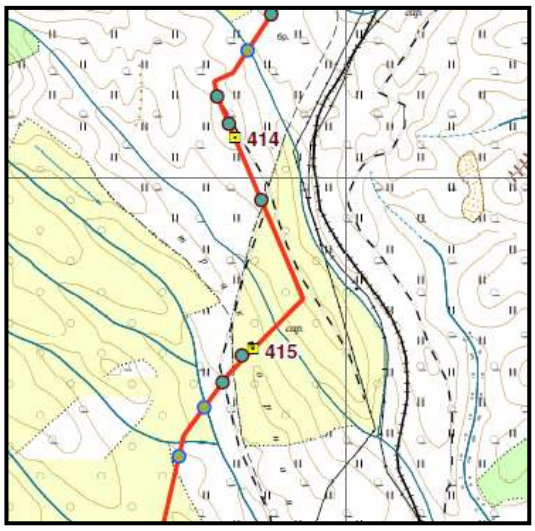


Photo 1 – RoW with good vegetation on the opposite slope and less so on the near slope

Photo 2 – View of riprap and silt fencing on banks

Photo 3 – View south at the RoW with poor bio-restoration and soil movement on the far slope.

KP 416.4 Vulkanka River

The Vulkanka River has steep slopes on both sides of the river. The slopes are well protected with slope breakers and covered with grass (Photo 1). The river banks are protected with Reno matting and silt fencing (Photo 2). The RoW leading to the river from the south has inconsistent grass cover. Some is good as in Photo 3, and some is minimal as in Photo 4. More and more effective seeding is needed on parts of the RoW.

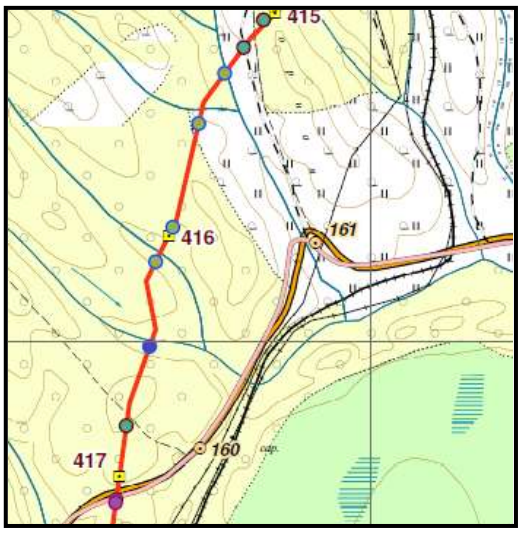


Photo 1 – View to the north across the river showing good vegetation on the slopes

Photo 2 – Reno mats and silt fencing on the banks

Photo 3 – RoW leading to the river with good grass cover.

Photo 4 – RoW leading to the river with poor grass cover.

KP 421.4 Pugachevka River

The Pugachevka River crossing was damaged during last's year typhoons. During the storm, the pipe was exposed on the north bank and the Company conducted emergency repairs which included a new gabion wall on the north bank (Photo 1) and bank fortification of the south bank upstream of the crossing using large rock riprap (Photos 3 and 4). The south bank within the crossing has a gabion wall which is almost entirely buried by natural river deposits (Photo 2). Reportedly, this crossing is scheduled for additional works this year following the spawning season.

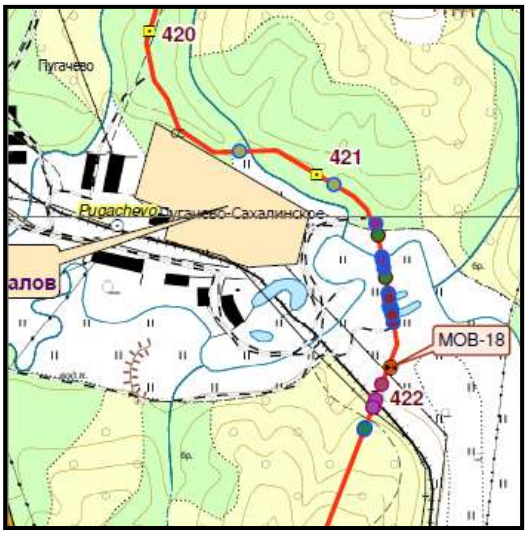


Photo 1 – View of gabion wall on the north bank

Photo 2 – South bank with mostly buried gabion wall

Photo 3 – View of the south bank upstream of the crossing with temporary fortified bank

Photo 4 – same as photo 3, the new fortification starts where the gabion wall ends

KP 434.4 Unnamed tributary to the Travyanaya River

The unnamed tributary which crosses the RoW was heavily eroded during last's year typhoons and required emergency repair. The stream's bed and banks are now completely protected by Reno mats and gabion walls Photo 1 and 2). Further work was performed upslope from the tributary on a minor crossing drainage in order to prevent erosion across the RoW (Photo 3).

The slope leading to the tributary is in need of bio-restoration (Photos 1 to 3).

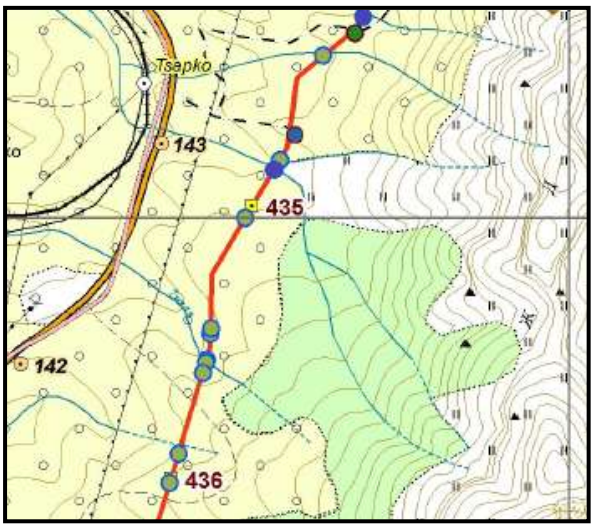


Photo 1 – View to the north across the tributary showing gabion walls

Photo 2 – View of cascading Reno mats and gabion wall construction

Photo 3 – Armouring of a crossing drainage

KP 434.8 Travyanaya 2 River

The Travyanaya 2 river crossing has steep slopes above the banks. The south slope has a crossing drainage that was previously difficult to control. Subsequently, the drainage was rerouted to flow along the RoW and to enter the river on the upstream side. This results in difficulties with erosion and sediment control. The Company is aware of the situation and more work is scheduled to be performed on this slope (Photos 1 and 2). The river banks are protected with Reno matting and riprap.

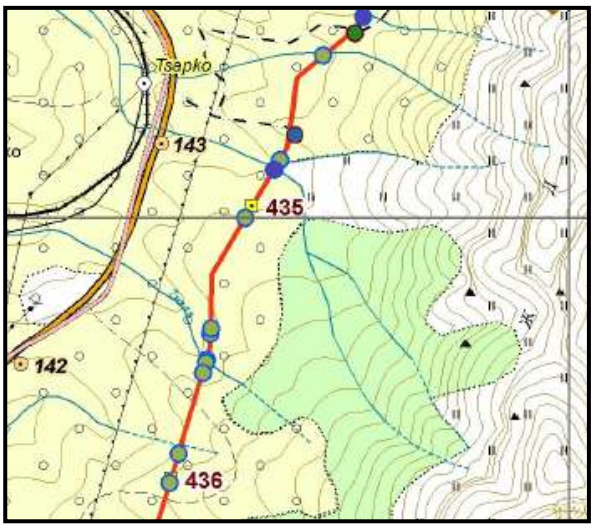


Photo 1 – River valley with south slope drainage

Photo 2 – Close up of the drainage channel

Photo 3 – View of river banks with Reno mats

KP 442 RoW near MOB-20, north of Tikhaya River

A permanent road was build to provide access to the BVS north of the Tikhaya River. The RoW in the vicinity of the station has inconsistent ground cover and can use additional seeding on certain parts (Photos 1 and 2).

Photo 1 – View north showing RoW with good grass cover.	Photo 2 – View south showing RoW with lesser coverage. Also note the permanent access road.
	

KP 444.3 Tikhaya River

The Tikhaya River flows adjacent to the railroad and both were crossed using a horizontal thrust boring method. This resulted in undisturbed river banks which can be seen in their natural state in Photos 1 and 2. The river valley was disturbed by the excavation for the thrust boring and pipe trenches but it is graded and mostly well vegetated. As Photo 1 shows, the vegetation in the valley is in better condition than on the slope the south.

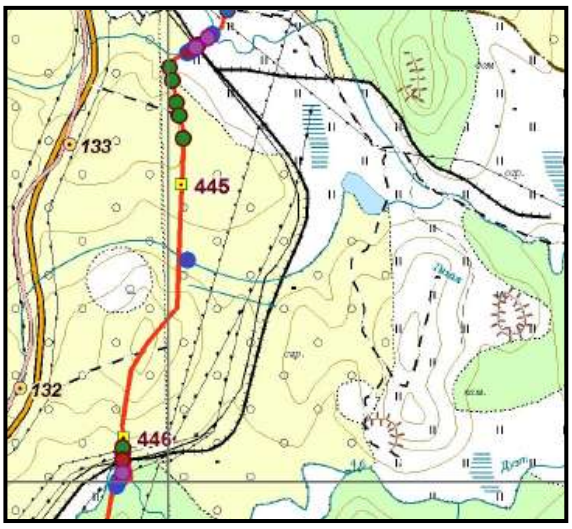


Photo 1 – View south across the river and railroad

Photo 2 – view of river banks

KP 449 Duet 2 River

The Duet 2 river crossing is situated at the northern edge of the river valley with a small slope to the north and a broad valley to the south.

The river banks are protected by Reno matting that held during last year's storms and the spring thaw (Photos 1 and 2). The Company is reportedly monitoring the condition of the leading edge of the Reno matting upstream of the crossing for possible erosion along the bank. The slope is partially vegetated (Photo 2) although is in need of further seeding. The valley between the Duet 2 and Duet 3 crossing (Photos 3 and 4) is mostly vegetated but shows inconsistency in grass cover and will benefit from additional seeding.

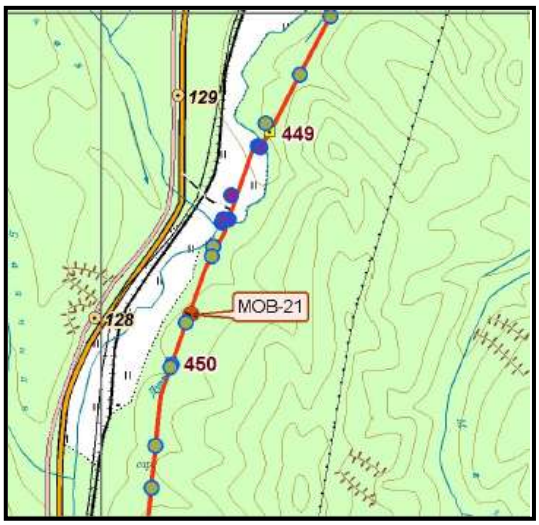


Photo 1 – South bank with Reno mats

Photo 2 – View across the river to the north slope

Photo 3 – View to the north of partially vegetated ROW between Duet 2 and 3

Photo 4 – View to the south of RoW between the two crossings with better ground cover.

KP 449.5 Duet 3 River

The Duet 3 River crossing is situated at the southern edge of valley, and the river flows along the RoW to the Duet 2 crossing (see above). The river banks are protected with Reno mats and are partially vegetated. A temporary bridge is still in place as well as the running track on the RoW, leading south to a BVS (Photos 1 and 2). Reportedly, a plan is being formulated to construct a permanent bridge and access road.

The silt fencing is damaged and will need to be repaired until construction activity is finished.

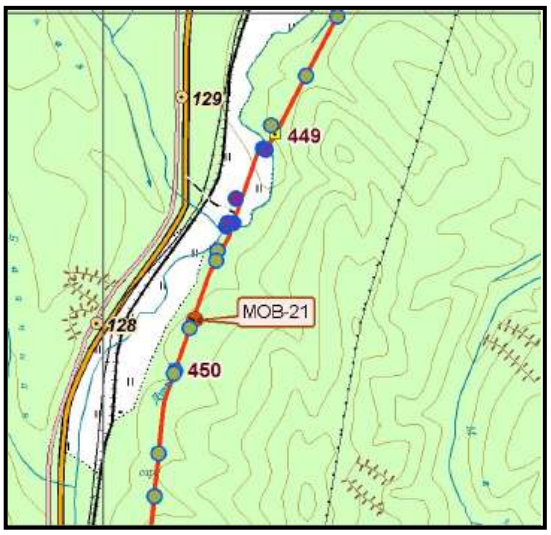


Photo 1 – View of river bank with Reno mats and temporary bridge

Photo 2 – View across the river at RoW with running track leading to BVS

KP 465.5 Krasnaya River

The Krasnaya River has a long steep slope on the south side and a flat river valley on the north. The River banks are protected with Reno mats and silt fencing (Photos 1 and 2). The slope is well vegetated and protected with slope breakers and drainage control. The river valley and the RoW across the Federal Highway are well vegetated (Photos 2 and 3).

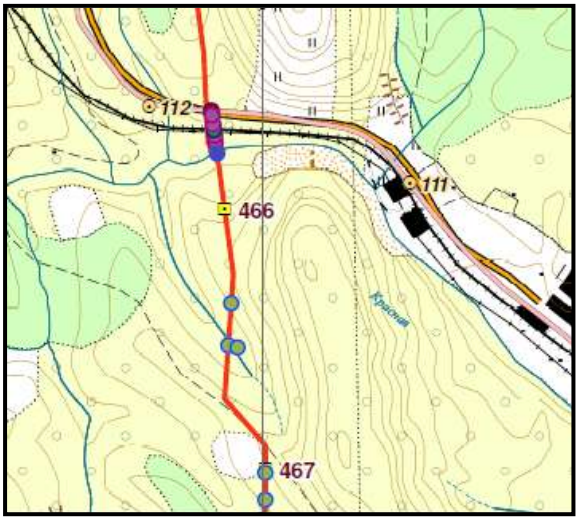


Photo 1 – South showing slope and river crossing.

Photo 2 – View of crossing and slope

Photo 3 – View north across the Federal Highway

KP 483.7 Slavnaya River

The Slavnya River is protected with Reno mats and silt fencing. The slope on the south side of the crossing has soil movement at mid slope and erosional rill development. Sakhalin Energy personnel noted the situation and added the site to its maintenance list.

There is a temporary bridge on the crossing and a running track which continues north. Reportedly, the Company is reviewing the temporary bridge situation in this area and will make a decision in the near future regarding running track and temporary bridges in the area.

Photo 1 – View north showing river crossing and temporary bridge

Photo 2 – View of south slope with soil movement at mid slope

KP 488.3 Primorskaya River and RoW

The Primorskaya River banks are protected with Reno mats and are partially vegetated (Photo 1). The RoW leading the river from the BVS to the south is not fully reinstated (Photos 2 to 5) and is on the Company's works schedule for this year. More work is needed on slopes protection such as slope breakers and drainage control, as well as repairing erosion that has already occurred (such as erosion rills – some which are quite deep), and soil movement on the lower part of the south slope above the river (Photo 4).

The entire segment of RoW between the BVS and the river is almost completely without vegetation. In addition, the slope north of the river is need of better erosion control and seeding.

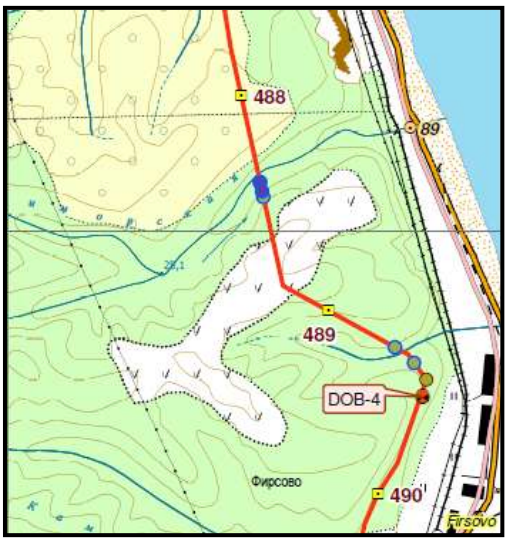


Photo 1 – River banks protected with Reno mats and partially vegetated.

Photo 2 – View of ROW with sparse ground cover

Photo 3 – RoW with sparse ground cover and erosional rills

Photo 4 – South slope with soil movement and sparse ground cover

Photo 5 – View of south slope protected with slope breakers but with sparse grass cover. North slope with minimal slope protection and grass cover.	

KP 490.3 Nizhni Kamisovka River

The river crosses the RoW with a meander.

The banks are well protected with Reno mats (Photo 1). The mats are generally in good condition and are partially vegetated. There is a subsidence in the north bank on the upstream portion of the crossing (Photo 2) in the vicinity of the gas pipeline. Sakhalin Energy personnel have noted the subsidence and have added it to the maintenance schedule.

The RoW in the vicinity of the crossing is well vegetated. South of the crossing where there is a near vertical, tall side cut; Sakhalin Energy had installed a gabion wall and soil buttress against the cut. The soil on the buttress is well vegetated but the remaining exposed side cut is not (Photo 1).

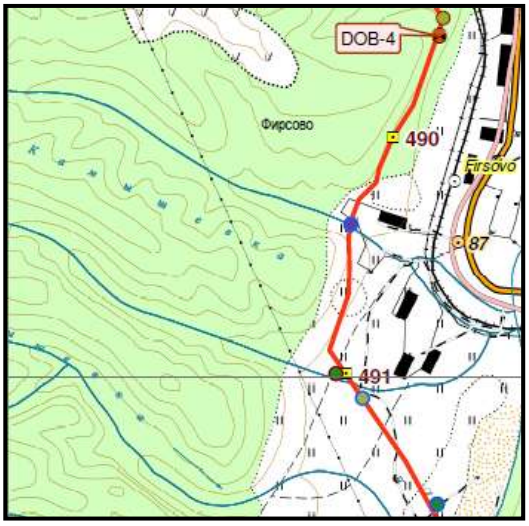


Photo 1 – View to downstream showing bank protection

Photo 2 – View to upstream showing bank protection and subsidence on the north bank

KP 497.2 Listvonitza River and Fault Crossing 17

The river crossing is located at the foot of a steep slope associated with Fault Crossing No. 17.

The river banks are protected with Reno mats and are partially vegetated. The RoW and slope to the south are mostly well vegetated and with erosion control on the slope (Photo 1). The slope to the north is the beginning of the fault crossing. The RoW section between the fault crossing and the river bank has no vegetation at all (Photo 2). However, silt fencing is in place between the river bank and the RoW.

Photo 1 – View of the crossing with Reno mats, and the RoW and south slope with good vegetation.

Photo 2 – View of the north bank and adjacent RoW between the river and the Fault Crossing – note the lack of vegetation.

KP 510.4 Podgornaya River and Slopes

The river banks are protected with riprap and silt fencing and are partly vegetated (Photos 1 and 2).

The slope to the north is need of further bio-restoration as it has almost no ground cover (Photo 3). The south slope has very good grass cover and slope breakers (Photo 4). The work on this slope was part of the effort to stabilise the Sovetskoye Ridge (see next entry) and was performed by a specialist subcontractor and then hydro-seeded.

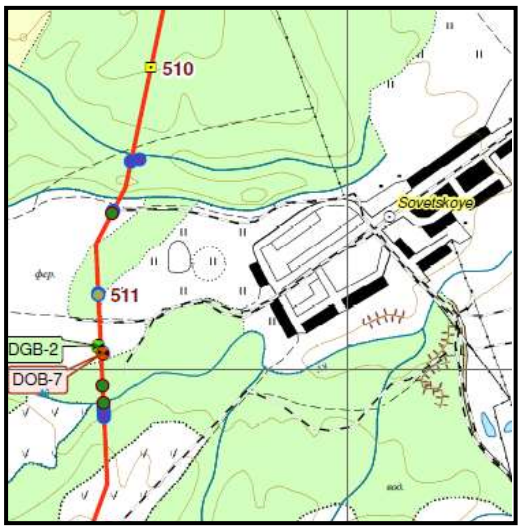


Photo 1 – Downstream showing riprap and vegetation on banks

Photo 2 – Upstream showing riprap and vegetation on banks

Photo 3 – Slope protection and vegetation on the near slope, lack of vegetation on the north slope

Photo 4 – Slope protection and vegetation on the south slope.

KP 510.5 Sovetskoye Ridge and Ai Valley

This ridge had soil stability problems during construction. A specific soil drainage and slope protection design was implemented using a specialist subcontractor. The ridge is under scheduled geotechnical observation and to date appears to be holding well. The surface has dense vegetation cover due to hydro-seeding (Photos 1 and 2).

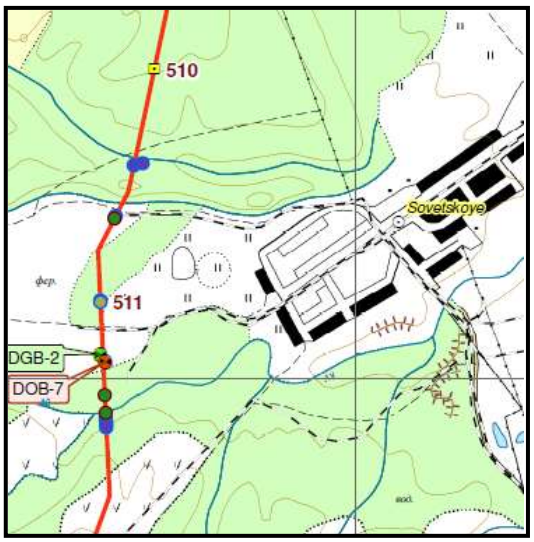


Photo 1 – View of Sovetskoye slope with good protection and dense vegetation.

Photo 2 – close up of the dense vegetation cover.

KP 511.5 Ai River and Slope

The Ai River has a short steep slope on the south side and a broad river valley on the north side. The Slope is protected by slope breakers and dense vegetation and held well. Reportedly, in 2009, trench breakers were installed in both pipe trenches resulting with improved slope stability (Photo1). The banks are protected with Reno matting and are partly vegetated. The RoW on the Ai valley is well vegetated (Photos 1 and 3).

At the BVS, there are two diesel day tanks (Photo 4) which reportedly are necessary for the backup generator since the gas take-off generator is in repair.

These tanks require secondary containment.

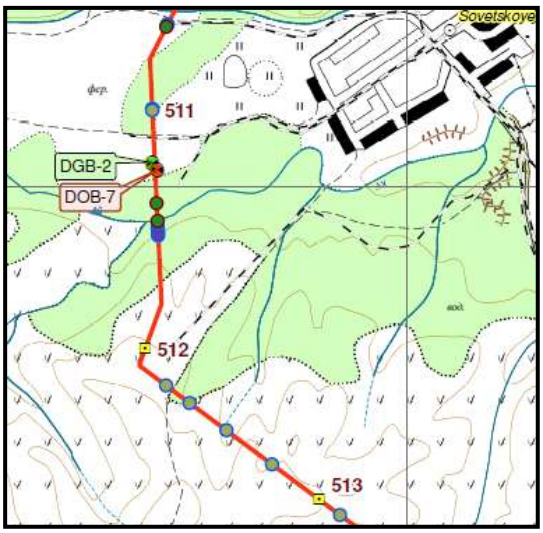


Photo 1 – View to the south showing protection on slope and good vegetation.

Photo 2 – Upstream showing north bank with partially covered Reno mats with good grass cover

Photo 3 – View north showing good vegetation on the RoW along the river valley

Photo 4 – Diesel day tanks without secondary containment

KP 512 Sandy Slopes and Fault Crossing 19

The sandy slopes along the RoW in this area have very inconsistent grass cover, but mostly they are without any vegetation at all (Photos 1 to 6). Much work was done to protect some of the steep slopes with slope breakers and generous use of geotextile. The slopes that were observed during the visit appear to mostly hold well following the typhoon and the thaw, but rills have already started to develop (Photo 3) and with future rains will act as preferential conduits and will grow larger. The area is in need of thorough bio-restoration to prevent future erosion.

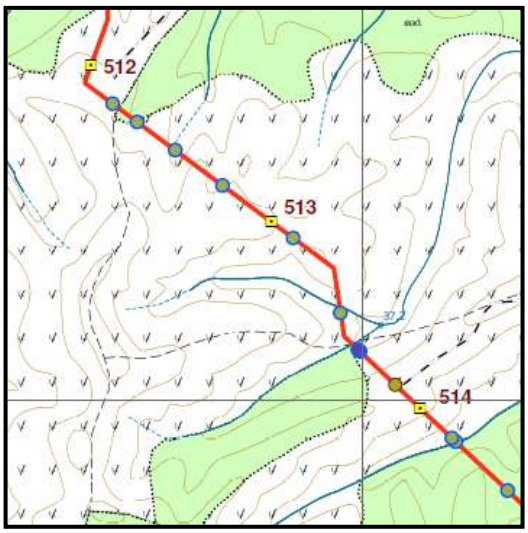


Photo 1 – View north showing RoW with slope breakers and very sparse vegetation

Photo 2 – View south showing RoW with good grass cover.

Photo 3 –Lack of vegetation and rill development

Photo 4 – RoW with erosion control but without vegetation

Photo 5 – Heavily protected crossing drainage, including slope breakers and geotextile 	Photo 6 – As in Photo 5 

KP 532 Dolinsk Wetlands

The RoW runs through a low lying wetlands area 2 km west of Dolinsk (see map).

There are three main issues along this stretch of RoW: the running track tree trunk foundations that weren't removed upon completion of construction (Photo 1), the presence of concrete blocks and foundations that have been left in-situ (Photo 2) and the areas of peat that have not been levelled back to ground level over the tops of the pipes (Photo 3). Sakhalin Energy has accepted that there is a problem and are arranging to rectify the issues. The RoW generally has re-vegetated naturally back to a reasonable state of repair (Photo 4) but there are areas where the groundwater flows are interrupted causing ponding (Photo 5). All works are proposed to be carried out manually in order to minimise further damage with personnel and equipment all walking into the sites to be repaired. This is accepted as best practice in this instance.

Photo 1 – Foundations of log road in situ

Photo 2 – Concrete blocks in situ

Photo 3 – Twin mounds over the pipelines

Photo 4 – Good re-vegetation on RoW

Photo 5 – Ponding due interrupted groundwater flow

KP 600.6 Paltovka River and RoW

The river is protected with Reno matting and silt fences (Photo 1). The slopes have slope breakers, which held during last year's storms and the spring thaw. A location of subsidence was visible on the RoW between the pipes and was noted by the Company representatives.

There is very little vegetation on the slopes and there is a need for additional bio-restoration to prevent future erosion (Photos 2 and 3). A flat portion of the RoW at the north side of the access road is well vegetated (Photo 4).

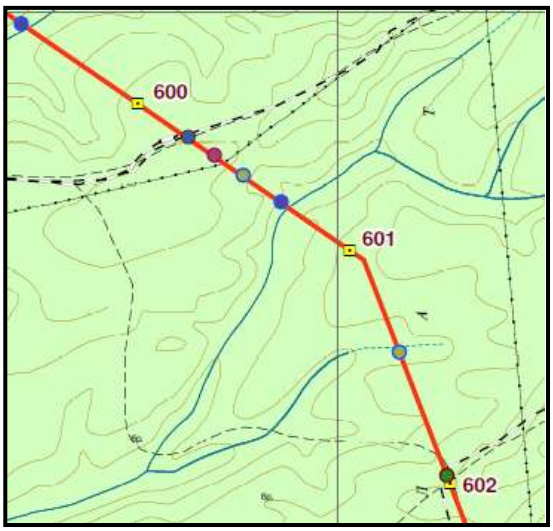


Photo 1 – View south showing river crossing and slopes with slope breakers and very little vegetation

Photo 2 – Showing slopes with drainage control but with little to no vegetation.

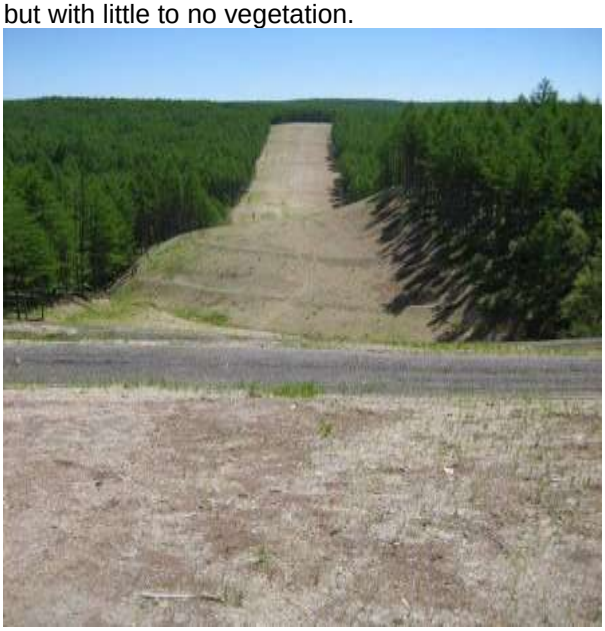


Photo 3 – Showing slopes with drainage control but with little to no vegetation

Photo 4 – Flat RoW near access road with good grass cover.

KP 608 RoW

RoW segment along an access road at KP 608, showing good grass cover.

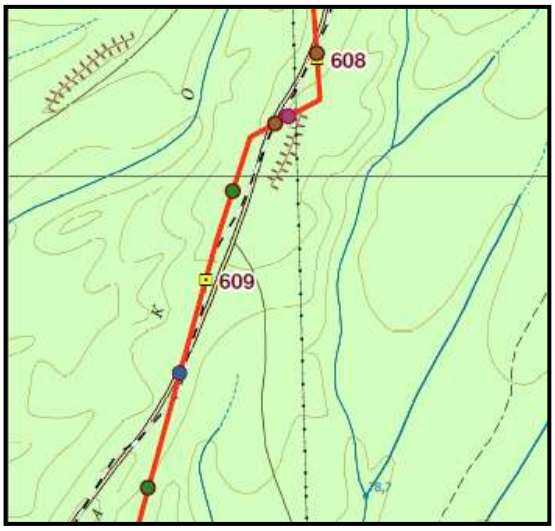


Photo 1 – RoW segment with good grass cover	Photo 2 – RoW segment with good grass cover
	

KP 611 RoW

RoW segment at a forestry road crossing, showing poor grass cover. This location is in need of further seeding and application of fertilizer.

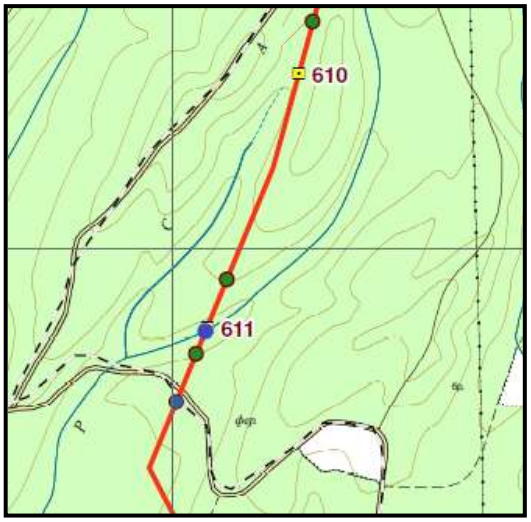


Photo 1 – RoW segment with poor grass cover

Photo 2 - RoW segment with poor grass cover

KP 614.5 RoW

A segment of RoW at forestry road crossing with a very good grass cover.

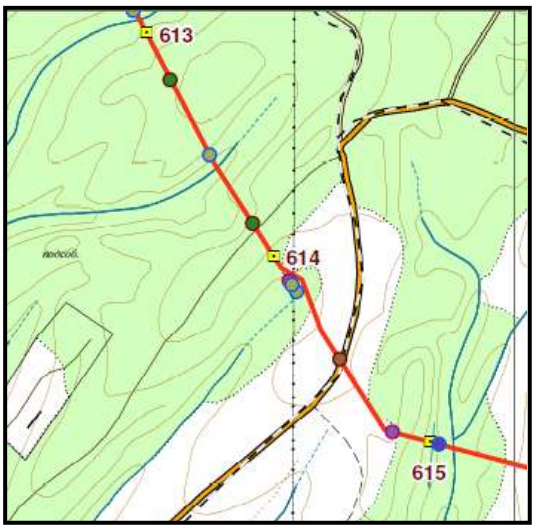


Photo 1 – View north at RoW segment with very good grass cover	Photo 2 – View north at RoW segment with very good grass cover
	

KP 616 Korsakov Block Valve Station

View from the BVS to the south shows the RoW with a permanent access road and good vegetation cover (Photo 1).

To the north of the BVS there is a crossing drainage protected by geo-jute and slope breakers. However the RoW in this segment has only spotty vegetation cover and is need of further bio-restoration (Photos 2 to 4).

Photo 1 – View south showing permanent access road and good bio-restoration.

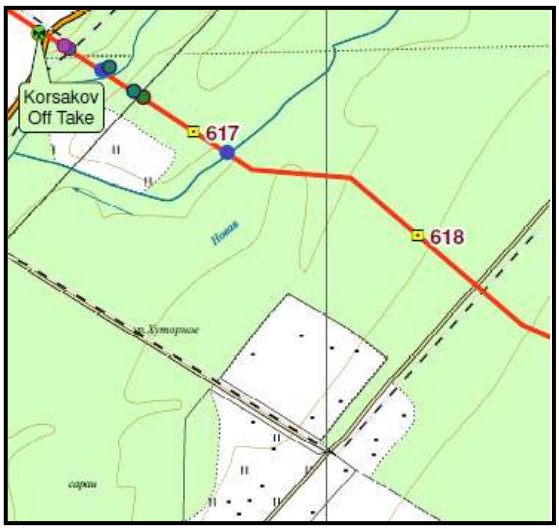
Photo 2 – View of the ROW north of the block valve without grass cover.

Photo 3 – View of a crossing drainage protected with geo-jute and slope breakers. However, poor grass cover.

Photo 4 – Slope breaker on the south slope with minimal vegetation.

KP 617 Korsakov River and slopes

The Korsakov River was crossed using horizontal thrust bore which left the river banks largely un-impacted except the location where current (non-Company) un-authorised vehicles are crossing the river.



At the time of the visit, it was noted that there were tyre tracks on the slope leading to the river and through the river to the opposite bank (Photo 1). This un-authorised use of the RoW has an adverse impact on the river banks and river bed. The banks are protected with geo-jute and show good growth with the exception of the vehicles crossing point.

The river valley has good vegetation cover (Photo 2) but the slope leading to the river from the north has very poor vegetation and shows strong erosion (Photo 3 and 4). This slope is need of additional and more effective slope breakers and full bio- restoration.

Photo 1 – View of banks with natural vegetation but disturbance where the bridge was located

Photo 2 – View to the north showing river valley with good vegetation but slope without vegetation.

Photo 3 – View of erosional rill development between slope breakers and lack of grass cover.

Photo 4 – View of deep erosional rill at mid slope

KP 621 Block Valve Station above Mereya River

A view from the BVS (KOB-2/KGB-1) to the south illustrates how the RoW splits in two separating the gas pipe and the oil pipe as they proceed to the LNG/OET plant and enter at different locations.

The RoW before and after the split has good vegetation cover and the slope from the BVS to the Mereya River valley is well protected with slope breakers (Photo 1). A view from the BVS to the north shows the RoW slopes protected with slope breakers but with poor vegetation cover (Photo 2).

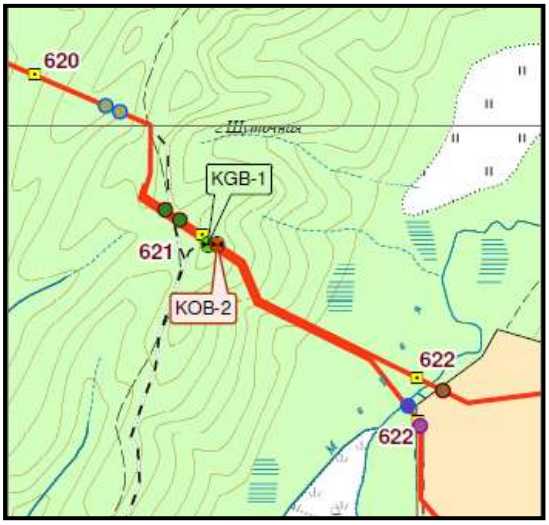


Photo 1 – View south at the Mereya slope and the ROW splitting in two at approach to LNG plant.

Photo 2 – View of RoW north of the BVS showing poor vegetation cover.

KP 622 Mereya River and Slopes

The Mereya River is crossed with two separated RoWs, one for the oil pipe (Photos 1 and 2) and one for the gas pipe (Photos 3 and 4). Both crossings are protected with Reno matting which fall short of the river bottom (photos 1 and 3). Company personnel noted this situation and reportedly it will be added to the maintenance schedule for repairs.

The RoW on both banks is well vegetated. The slope to the north of the valley is protected with many slope breakers and well vegetated (Photo 5).

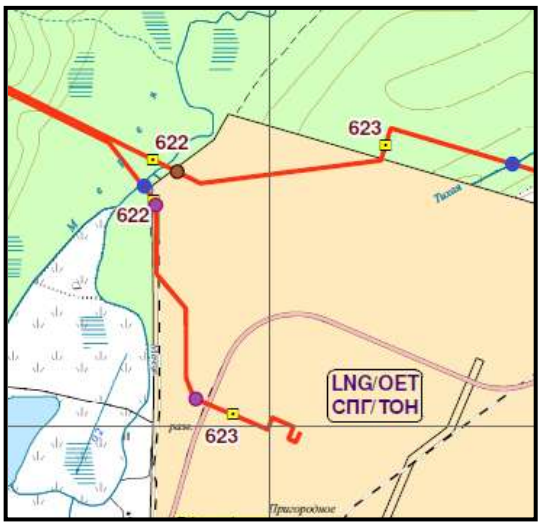


Photo 1 – View to north bank on oil pipe crossing showing Reno mats and some vegetation

Photo 2 – View to the south from oil pipe crossing showing well vegetated RoW

Photo 3 – View to north bank on gas pipe crossing showing Reno mats and some vegetation

Photo 4 - View to the south from oil pipe crossing showing well vegetated ROW

	Photo 5 – View to the north across the river crossing showing grass covered river valley and the slope protected with slope breakers and with vegetation.

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