Annex D: Individual RoW Descriptions

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List of RoW Locations Visited			
KP	**River / Location**	**Team**	**Date Visited**
12 - 14	Fault Crossing 1 and adjacent RoW	Northern	31 August 12
14	RoW	Northern	31 August 12
22	Khandusa River and RoW	Northern	31 August 12
23 – 25	RoW	Northern	31 August 12
41 – 43	RoW near Askasai River	Northern	31 August 12
63	Dagi River	Northern	31 August 12
67.3	Tomi River	Northern	31 August 12
83 – 84	Mali Veni River Slopes	Northern	31 August 12
88	RoW Slopes	Northern	1 September 12
109	RoW Road Crossing and BVS NOB 19	Northern	29 August 12
151 - 155	RoW and Spokoyney River at KP 153.6	Northern	2 September 12
15 - 21	Plelyarna River and RoW	Northern	1 September 12
38	Vstrechny River	Northern	1 September 12
40.5	RoW Road Crossing	Northern	1 September 12
42	Nabil River	Northern	1 September 12
44.8	RoW Road Crossing	Northern	1 September 12
45.6	RoW Road Crossing	Northern	1 September 12
47.5	RoW Road Crossing	Northern	1 September 12
56.7	Svetly Stream	Northern	1 September 12
65	Pilenga River	Northern	1 September 12
66.5	RoW Road Crossing	Northern	1 September 12
84.5	Voskresenovka	Northern	1 September 12
91	Tym River HDD site and RoW	Northern	1 September 12
94.3	RoW Road Crossing	Northern	1 September 12
95	Tym River	Northern	1 September 12
124	Sandy Slopes	Northern	2 September 12
128	Sandy Slopes	Northern	3 September 12
141 – 143	Taulan Valley RoW	Northern	3 September 12
143 - 145	Taulanka River Valley and RoW	Northern	3 September 12
169	Onor River	Northern	2 September 12

List of RoW Locations Visited			
KP	**River / Location**	**Team**	**Date Visited**
176.3	Sedmaya River and Slopes	Northern	2 September 12
178.5	Devyataya River and RoW	Northern	2 September 12
182.16	RoW Dig-Up	Northern	2 September 12
210	Fault Crossing KP 210	Northern	3 September 12
213	Pobedinka River	Northern	3 September 12
232	Elynaya River and RoW KP 232 to 238	Northern	3 September 12
300	Gastellovka River	Southern	31 August 12
327	Nitui River	Southern	31 August 12
334	Turkovka River	Southern	31 August 12
344	Gornaya River	Southern	31 August 12
346.5	Vidnaya River	Southern	31 August 12
348.8	Gar River	Southern	31 August 12
351	Kormovaya River	Northern	3 September 12
352	Krinka River	Northern	3 September 12
360	Makarovka River	Southern	30 August 12
362	Sosnovka River	Southern	30 August 12
370	Pegas River	Southern	30 August 12
370.2	Lesnaya River 1	Southern	30 August 12
370.2	Lesnaya River 2	Southern	30 August 12
373	Madera River	Southern	30 August 12
376	Zhelezhnyak River	Southern	30 August 12
380.6	Lesnaya River 3	Southern	30 August 12
382	NOB14 Landslide area	Southern	30 August 12
384.5	Lazovaya River	Southern	30 August 12
421	Pugachevka River	Southern	1 September 12
435	Travyanaya River	Southern	1 September 12
444	Tikhaya River	Southern	1 September 12
449.5	Duet River (3)	Southern	1 September 12
460	Manui River and Wetlands	Southern	2 September 12
466	Krasnaya River	Southern	2 September 12
483.7	Slavnaya River	Southern	2 September 12
502	Kirpichnaya River	Northern	3 September 12

List of RoW Locations Visited			
KP	**River / Location**	**Team**	**Date Visited**
511-513	Sandy Slopes	Southern	2 September 12
530	Dolinsk Wetlands	Southern	2 September 12
600.6	Pultovka	Southern	3 September 12
611	RoW Slopes and R. Vodopyanovka	Southern	3 September 12
617	Korsakovka River	Southern	3 September 12
621	BVS above Mereya River	Southern	3 September 12
622	Mereya River (and slopes to north)	Southern	3 September 12
Sokol	Sokol Lay-Down Yard	Northern	3 September 12

Fault Crossing 1 and adjacent RoW – KP 12 to 14

The drainage in Fault Crossing 1 was recently repaired at several locations by adding slope breakers and drainage channels surfaced with riprap. There is a marked difference between the south and north facing side cuts along the RoW. The south slope facing side cuts show good vegetation cover while the north facing side cuts have very poor cover. The north slopes are surfaced with geonetting which shows failure across the slope. This is usually the case when the geonetting is placed horizontally instead of vertically. It is recommended that the netting will be placed according to the manufacturers specifications. The RoW north of the Fault crossing shows good vegetation cover while the RoW cover south of the crossing is minimal and patchy.

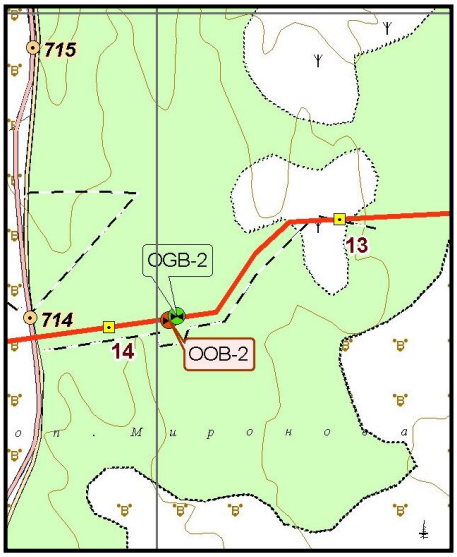


Photo 1 – View south showing repaired erosion control and re-seeding.

Photo 2 – View of north facing side slope with drainage repair and failing geonetting.

Photo 3 – View of north facing side cut with a horizontal failure of the geonetting.

Photo 4 – Failed geonetting on side cut.

Right of Way KP 14

The RoW is situated in a sandy, mostly flat area with minor undulation. The RoW is vegetated with grass and with the addition of many small trees (mostly Elder).

Some of the grass is already going to seed.

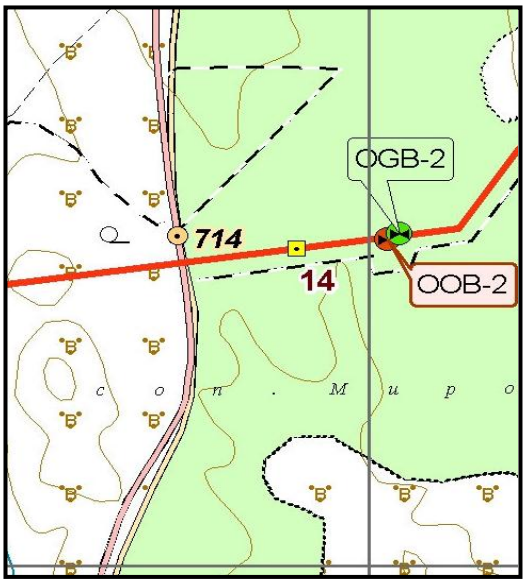
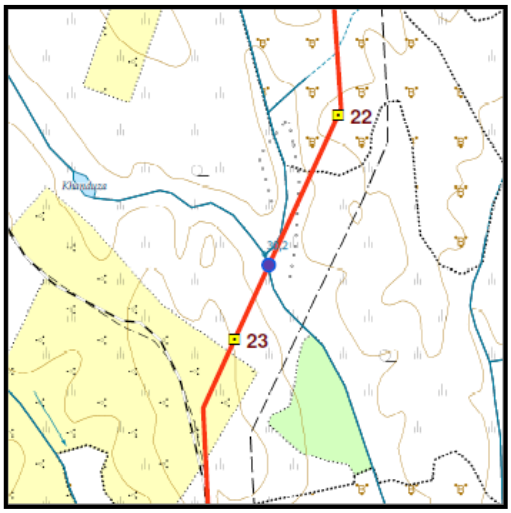


Photo 1 – View south towards block valve station (BVS) showing access road and a vegetated RoW with grass and small trees.	**Photo 2** – View north toward the Federal Highway road crossing, showing a vegetated RoW with grass and small trees.
	

Khandusa River and RoW – KP 22



The Khandusa River south slope is very well vegetated and the slope breakers on the steeper part are well preserved. The area north of the north bank is also very well vegetated by thick grass cover in the river flood plain. The slope further north was recently repaired and is currently fortified by Enkamat cover at the lower elevation. There is some vegetation already establishing through the Enkamat (Photo 3). One slope breaker was repaired and fortified, the rest are holding well and are partly vegetated.

A sand borrow area on the upstream side of the RoW is well protected by Enkamat and shows good vegetation cover (Photo 2). The river banks are heavily vegetated (Photo 1).

In general this area is substantially more vegetated than it was this time last year.

Photo 1 – View to the south across the river showing heavily vegetated valley and slope breakers on the steep slopes in the background.

Photo 2 – View of the river valley and reinstated sand borrow area upstream of the RoW.

Photo 3 (left) – View to the south from the north slope showing fortified northern slope and a repaired slope breaker.

RoW KP 23 to 25

The RoW area of KP 23 and 24 is situated in sandy soils and shows variety of vegetation cover. At the KP 23.5 area the RoW has been recently reseeded (and scarified prior to seeding), and shows some new growth already (Photo 1). At KP 24 and further, the RoW shows moderately good growth (Photo 2).

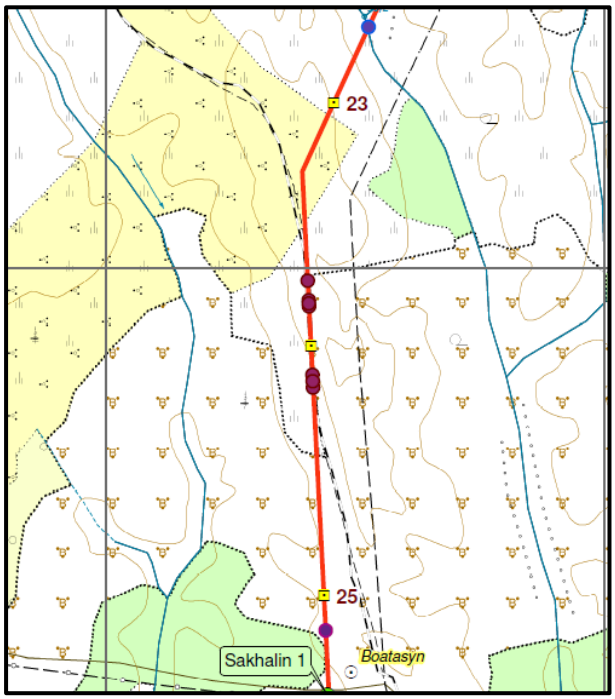


Photo 1 – View of the re-seeded RoW with scarified surface.

Photo 2 – View of moderately well vegetated RoW on gentle sandy slope.

KP 41 to 43 RoW

The RoW (KP 41 to 43) north of the Akasai River is sandy, with gently rolling topography. Most of this section of RoW is showing good vegetation cover (Photos 1 and 2).

The slopes in the section are well protected with slope breakers and with good vegetation cover.

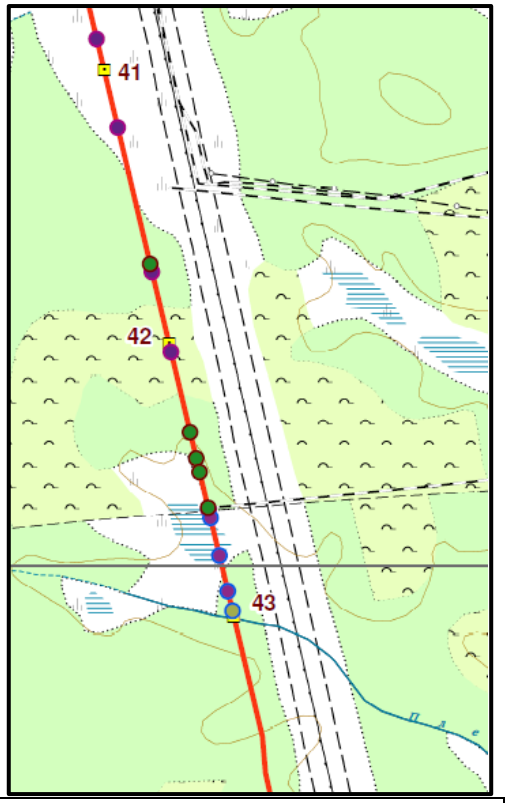


Photo 1 – View to the south showing well vegetated RoW.

Photo 2 – View of undulating RoW with good vegetation cover and slope protection.

KP 63 Dagi River Slopes, Block Valve NOB11 and RoW

The Dagi River valley is showing improvement although there is only partial vegetation cover over the pipe trenches in the wetlands and further improvement is needed (Photo 1). The southern slope and side cut are well protected with geojute and vegetation cover. The side cut is only partially vegetated and additional monitoring of the site is recommended (Photo 1).
The RoW south of the BVS is very well vegetated with variety of flora as well as tree saplings growth (Photos 2 and 3). The access road to NOB11 is currently suffering from deep erosion along the slope (Photo 4).

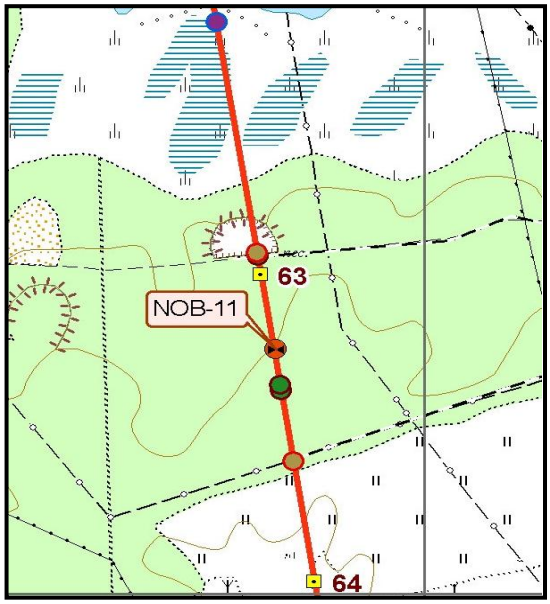


Photo 1 – View to north across the river crossing showing partially recovered wetlands and vegetated slope and side cut.

Photo 2 – View of RoW south of BVS showing good vegetation cover.

Photo 3 – View of RoW south of BVS, showing good vegetation cover and tree saplings.

Photo 4 – View of erosion along access road to BVS.

KP 67.3 Tomi River

The Tomi River crossing is situated at a base of a short but steep slope on the south side and a broad wetland valley on the north side. The river banks are thickly vegetated and the Reno matting appears to be in good shape but is mostly covered by vegetation. The slope to the south is protected by Enkamat and is thickly vegetated (Photos 1 and 2). The wetland north of river crossing is partially vegetated with peat clearly visible in large patches (Photo 3).

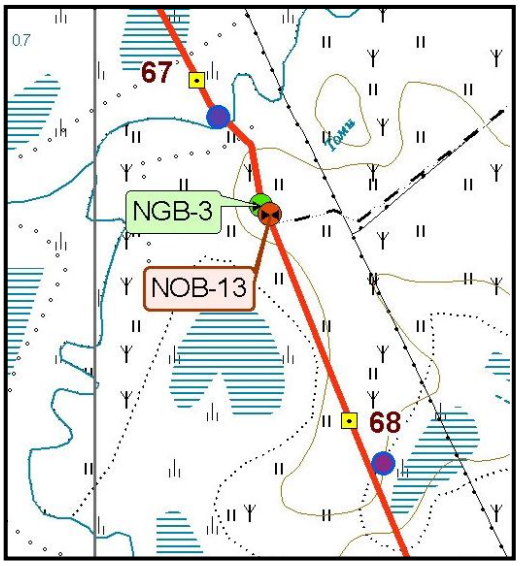
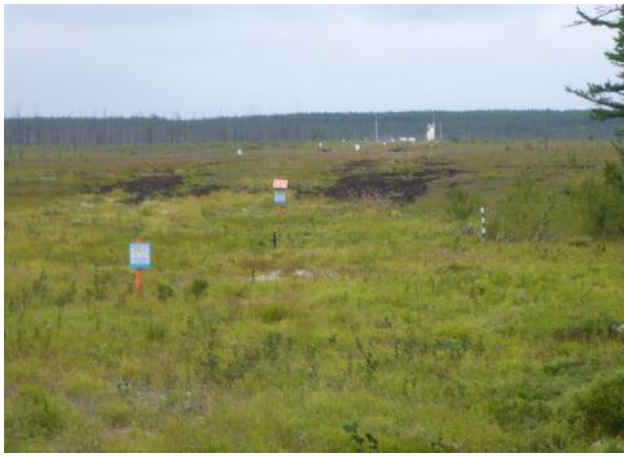


Photo 1 – View of the river crossing with thickly vegetated river banks. Reno mats are still visible at the far bank.

Photo 2 – View of the slope south of the river crossing with thick vegetation cover.

Photo 3 – View to the north showing the wetland valley with partially vegetated RoW.



KP 83 - 84 Mali Veni River Slopes

The river crossing is situated in a broad wetland valley with a long steep slope on the south end. The slope is well protected with slope breakers and good vegetation including saplings of Elder (Photo 1) in an improvement since last year when vegetation on the slope was sparse.

The wetland in the immediate vicinity of the crossing is showing poor regeneration of vegetation (Photo 2). However, further away the wetland is much better vegetated (Photo 3). Photo 3 also shows a well vegetated slope on the north side of Bolshoi Veni.

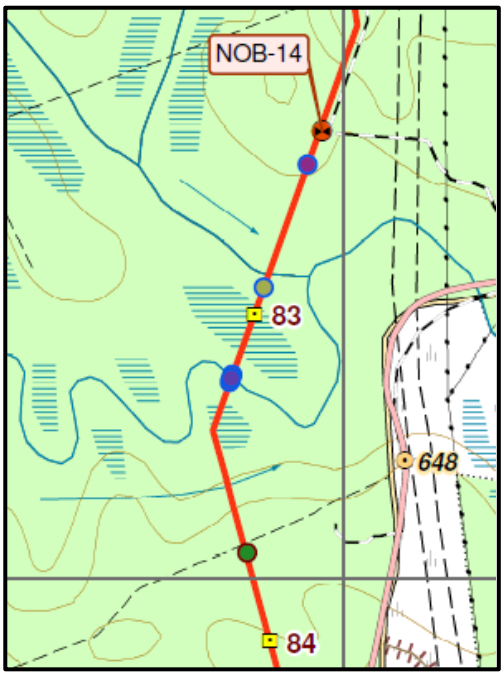


Photo 1 – View to the south showing the slope south of the crossing with slope breakers and good vegetation cover.

Photo 2 – View to the north showing the wetland on both side of the crossing with poor vegetation cover on both sides.

Photo 3 (left) – View to the north showing the Bolshoi Veni in the background at the base of the slope. Also note the mostly well vegetated valley between the two river crossings.

KP 88 RoW Slopes

The pipes cross the federal highway at KP 88 and 87. However, a new road is now constructed by by-passing the two crossing (see map).

One access is still available from KP 88 and was viewed during this trip. The RoW was very well vegetated on both the south and north of the crossing and the slopes on both sides were well protected with slope breakers and vegetation.

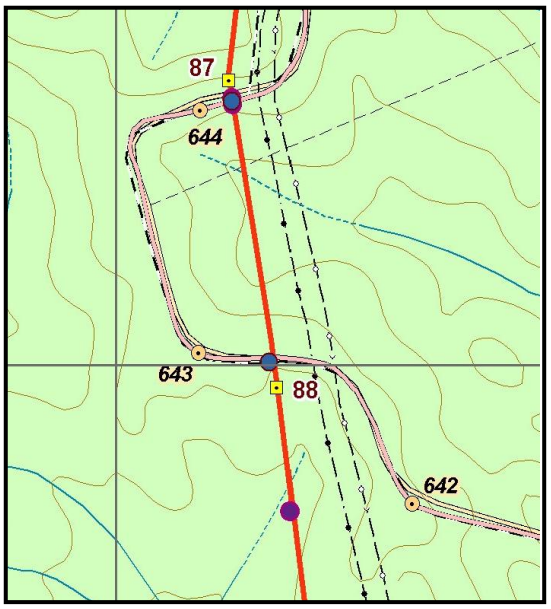


Photo 1 – View north of well protected slopes with good vegetation cover.

Photo 2 – View south of well protected slopes with good vegetation cover.

KP 109 RoW Road Crossing and Block Valve Station NOB 19

The RoW in the vicinity of NOB 19 is mostly well vegetated and with some thick patches of tree saplings.

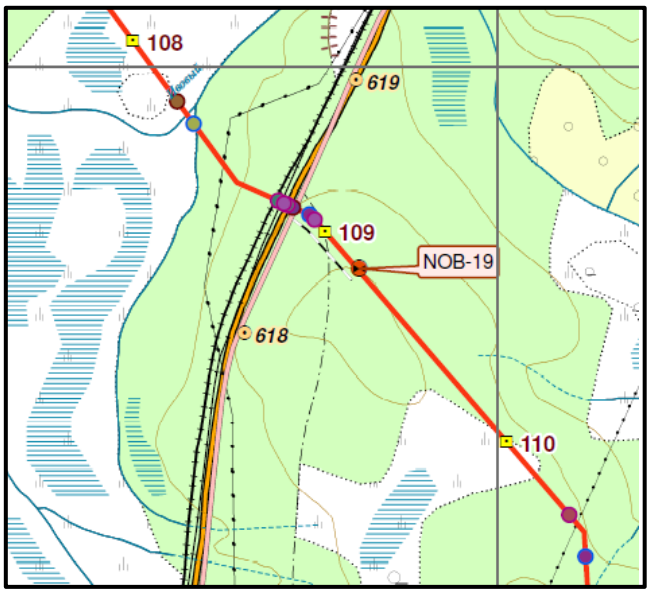
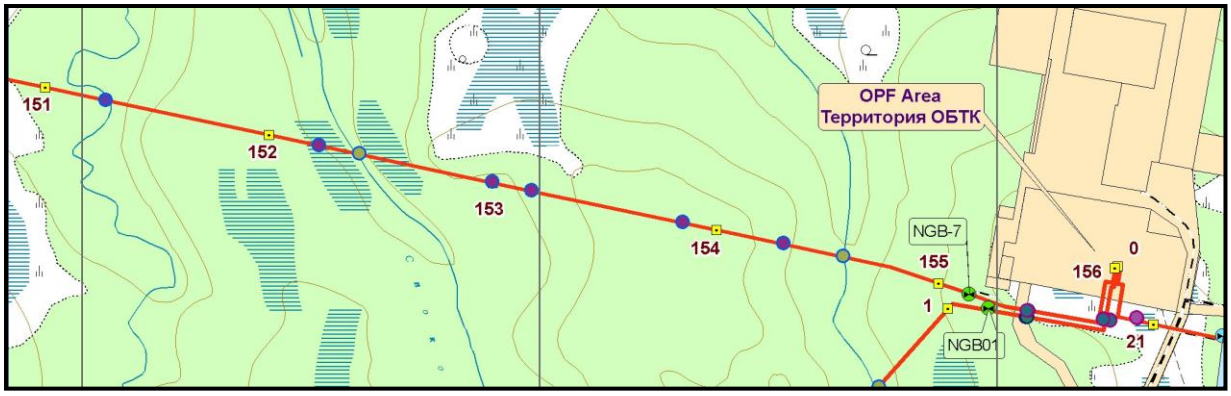


Photo 1 – View of a mostly vegetated RoW with growth of tree saplings.

Photo 2 – View of well vegetated RoW

Photo 3 (left) – View towards the road and railroad crossing showing good vegetation cover. Along the access road to the BVS there is thick growth of tree saplings.

KP 151 to 155 RoW and Spokoyney River



The section was viewed from the OPF at KP 155 towards the north at KP 151.

The RoW between the OPF and the wetlands that start at approximately KP 152.7 are well vegetated and with protected slopes (Photo 1). The access road is at the centre of the RoW and is crossing several streams (Photo 2) using temporary (from construction period) bridges that have been upgraded and equipped with sediment control. These bridges are reportedly to stay permanently and are not planned to be replaced in the near future. The streams which are crossed and the Spokoyney River (KP 152.4) (Photo 3) have well protected banks with riprap and good vegetation cover.

The wetlands which start at approximately KP 152.7 are well recovered (Photos 4 and 5). The section ends at the Block Valve Station NOB 24 where the pipes are HDDed below an area of archaeological significance within the forested area. The area is identified with several warning signs (Photo 6).

Photo 1 – View to the north showing well vegetated RoW with protected slopes.

Photo 2 –View of a stream crossed by the access.

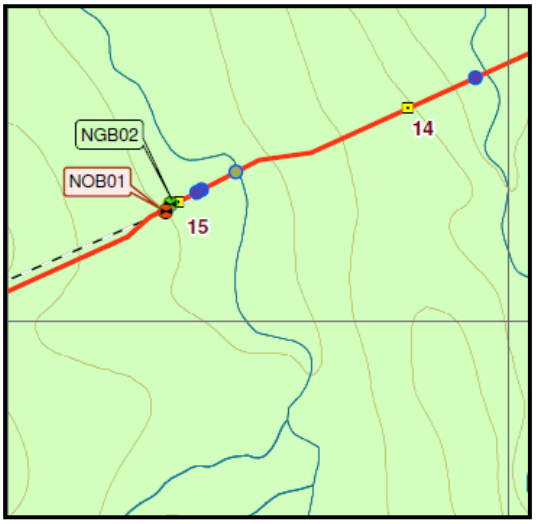
Photo 3 – View of Spokoyney River crossing showing good bank protection and upgraded temporary bridge.

Photo 4 – View to the north showing recovered wetland

Photo 5 – View to south showing recovered wetland

Photo 6 – View to the north showing the archaeological area next to NOB 24

KP 15 Plelyarna River and RoW KP 15 to 21



The river was accessed by a long access road starting at KP 21 and ending at KP 15 at the river crossing and at Block Valve stations NOB 01 and NGB 02. The RoW between KP 21 and KP 18 (approx.) is well vegetated (Photo 1). However, between KP 18 and 15 (approx.) the RoW is sparsely vegetated and in some location lacking all vegetation and showing erosional channels (Photo 2).

Pleleyarna River banks are well protected with Reno mats and vegetation is starting to break through the mats.

Photo 1 – View to the south showing well vegetated RoW at the area of KP 18 to 21

Photo 2 – View of a RoW section in the area of KP 15 to 16 showing poor vegetation cover and a development of erosion channels.

Photo 3 - View to the upstream showing protected banks and vegetation coming through the Reno mats

Photo 4 – View across the river to the south Showing well protected river bank with riprap and Reno mats.

KP 38 Vstrechny River

The Vstrechny River has fully engineered gabion protected channel with both banks covered by gabion walls (Photos 1). The slope to the east is well vegetated and protected with slope breakers (Photo 2). The slope to the west is partially vegetated (Photo 3). The toe of the gabion wall towards the incoming flow at the upstream is holding well. The bottom Reno matt is partially above the flow with some undercutting below it (Photo 4) and should be monitored.

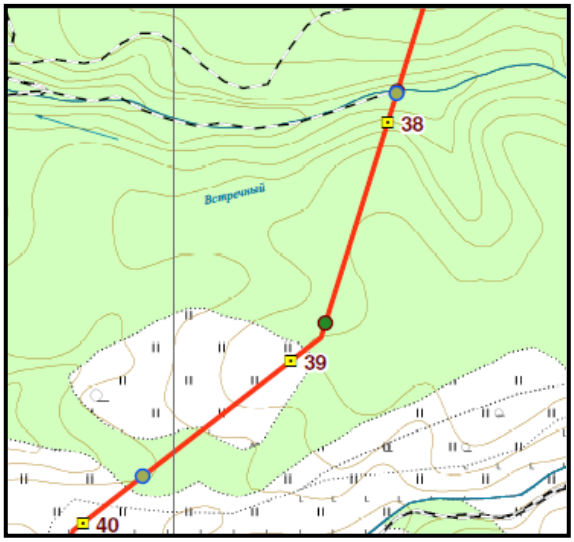


Photo 1 – View to the downstream showing gabion banks and vegetated slopes

Photo 2 – View to east showing steep vegetated slope with slope breakers

Photo 3 – View to the west showing partially vegetated steep slope.

Photo 4 – View to the upstream showing the toe of the gabion wall at the impact point of the stream.

KP 40.5 RoW Road Crossing

The RoW at the road crossing shows good vegetation cover and well protected slopes with slope breakers.

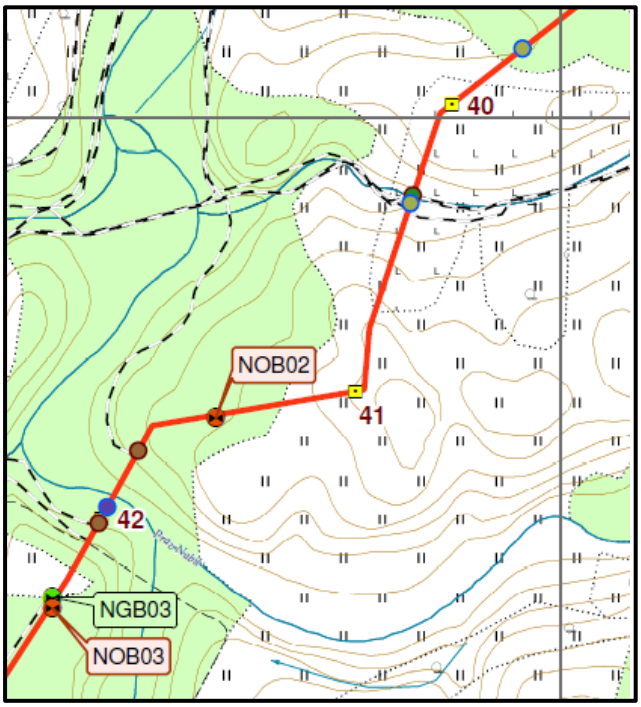


Photo 1 – View to the south showing the RoW with a well vegetated and protected with slope breakers.

KP 42 Nabil River Crossing

The Nabil River crossing has two steep slopes. The east slope RoW was blasted through rock (Photo 1) and is currently exposed rock with no vegetation. The western slope is well vegetated and protected with slope breakers. The river banks are protected with heavy riprap on the western bank of the river and rock in place on the eastern bank (Photos 2, 3 and 4).

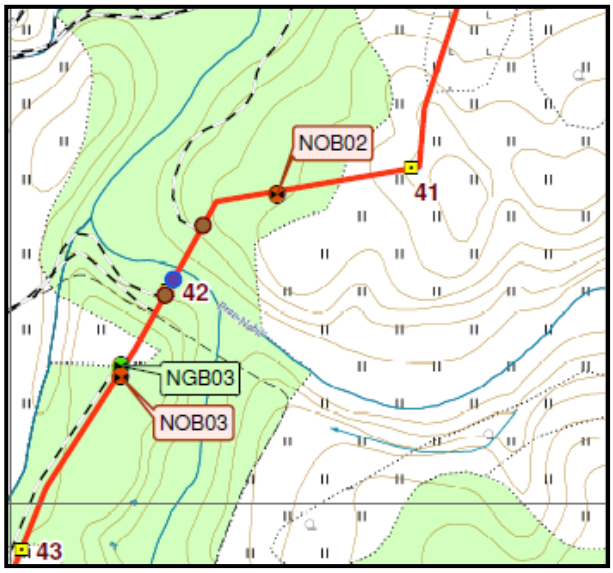


Photo 1 – View of the west slope showing good vegetation and slope breakers.

Photo 2 – View of the east bank showing blasted rocky RoW in stable condition.

Photo 3 – View downstream showing well protected banks with heavy riprap on the west bank.

Photo 4 – View to upstream showing riprap and vegetation growing on the bank and through the rocks.

KP 44.8 RoW Road Crossing

The RoW at road crossing at KP 44.8 shows good vegetation growth on both sides to the distance. The RoW to the west of the road has a short slope in the distance with a slope breaker.

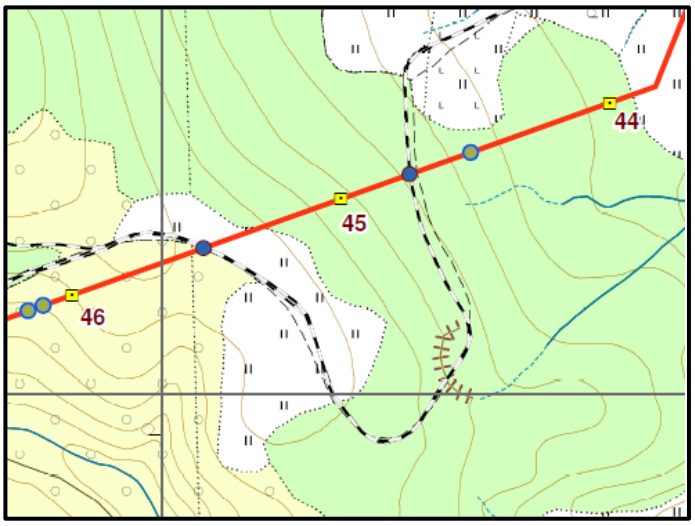


Photo 1 – View of the RoW to west of the road showing good re-vegetation and slope protection

Photo 2 – View east of the road showing good re-vegetation.

KP 45.6 RoW Road crossing

The RoW at KP 45.6 was observed from a road crossing. The RoW on both sides has very good vegetation cover – grass east of the road and clover west of the road on a gentle slope.

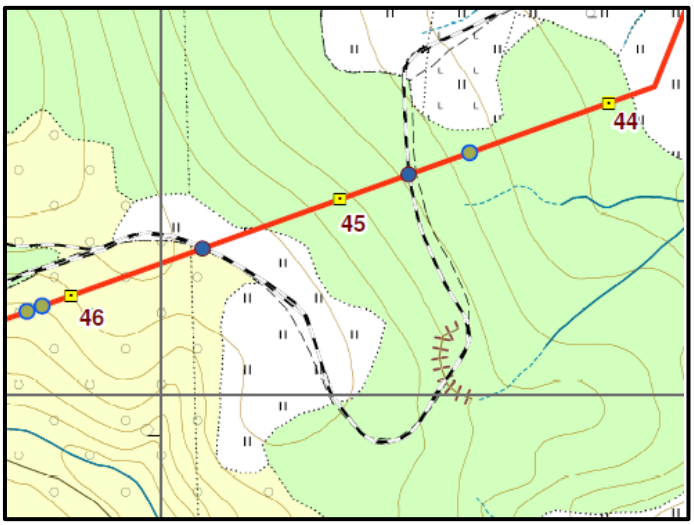


Photo 1 – View to west at a gentle slope on the RoW with good vegetation cover – clover in this case.

Photo 2 – View to the east at mostly flat RoW with good grass cover.

KP 47.5 RoW Road Crossing

The RoW was observed from a road crossing with an extensive view to the east showing well vegetated RoW and slopes protected with slope breakers (Photo 1).

To the west the visible slope was well vegetated (Photo 2)

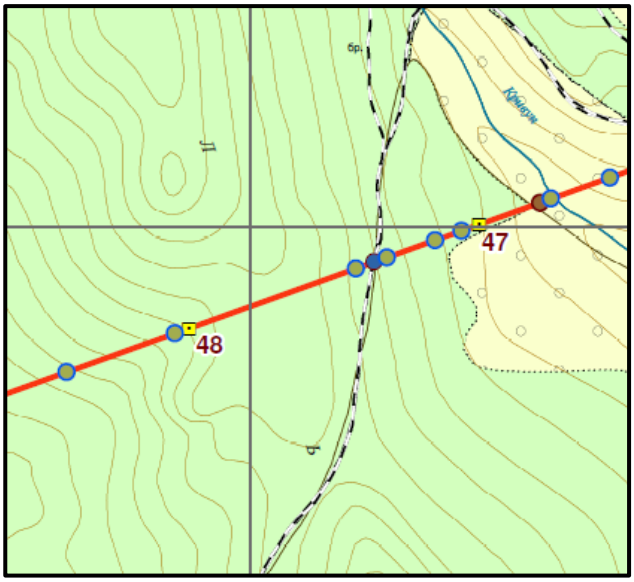


Photo 1 – View of slopes to the east of the crossing. Showing good recovery and slope protection

Photo 2 – View of the slope to the west showing good vegetation cover.

KP 56.7 Svetly Stream

The Svetly Stream crossing is situated between two gentle slopes. The river banks are well protected with riprap and show good vegetation growth through the riprap including grass and willows (Photos 1 and 2).

The slopes on both sides of the stream have slope protection and vegetation cover (Photos 3 and 4).

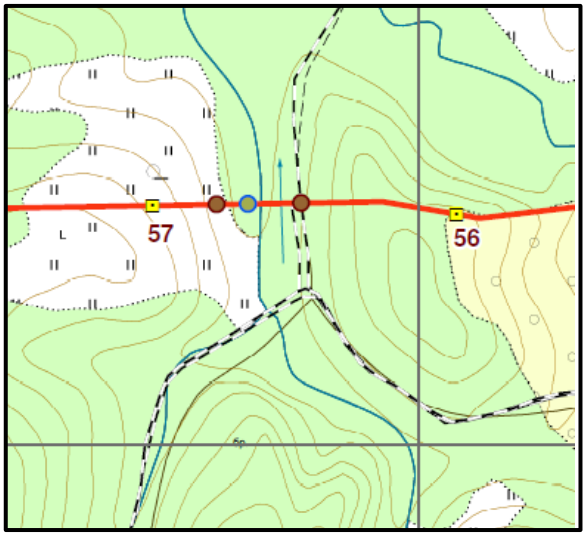


Photo 1 – View to the upstream showing riprap and vegetation on banks.

Photo 2 – View to the downstream showing riprap and vegetation on banks.

Photo 3 – View to west showing slope protection and vegetation cover.

Photo 4 – View to the east showing slope protection and vegetation cover.

KP 65 Pilenga River

The Pilenga River crossing and RoW is situated in a mostly flat area near Block Valve station TGB 01 and TOB 01. The river banks are well protected with thick grass and small willow trees (Photo 1)

The RoW to the north has thick vegetation cover and small willows and the RoW to the south shows good ground cover (Photos 2 and 3).

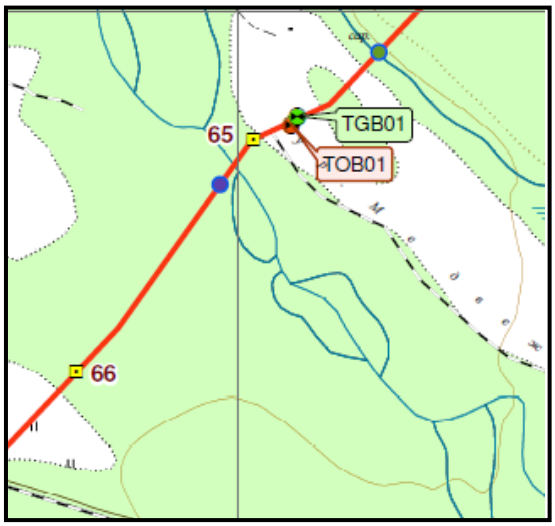


Photo 1 (right) – View of the river with stable banks and thick vegetation cover including grass and willow trees.

Photo 2 – View to the north showing thick vegetation cover on the RoW

Photo 3 – View to the south showing well recovered RoW.

KP 66.5 RoW at Road Crossing

The RoW road crossing is situated south of the Pilenga River crossing at a high point between the Pilenga and the stream to the south of it. The RoW in both directions shows a good vegetation cover of grass to the northeast and grass and tree saplings to the southwest.

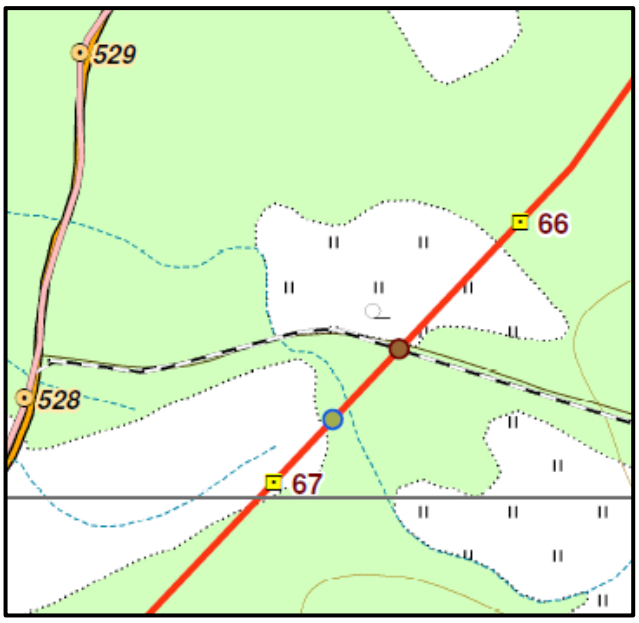


Photo 1 – View to the southwest showing well vegetated RoW with grass and small saplings.

Photo 2 – View to the northeast showing RoW with good grass cover.

KP 84.5 Voskresenovka River

The Voskresenovka River is protected on both banks with Reno mats. The mats are intact and some vegetation is growing through the matting (Photos 1 and 2). The leading edge of the Reno mat on the upstream impact point shows some wear and tear and may need maintenance in the future (Photo 3).

The RoW on both side of the river is showing good grass coverage, with much grass now going to seed (Photo 4)

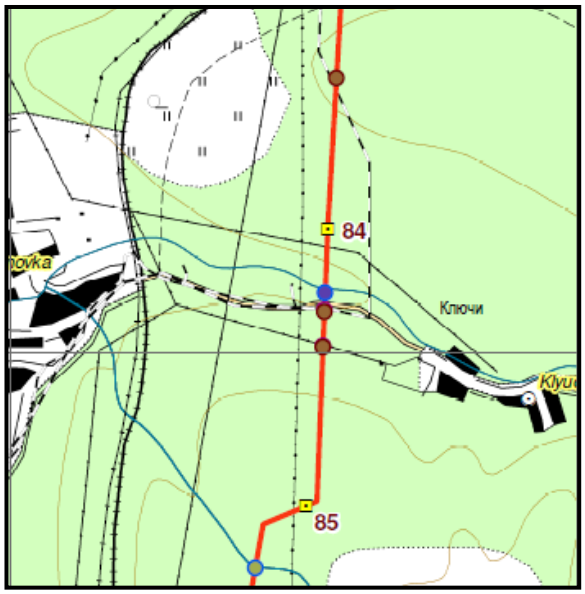


Photo 1 – View to downstream showing banks protected with Reno mats and vegetation.

Photo 2 – View to upstream showing banks protected with Reno mats and vegetation.

Photo 3 – View of the toe of the Reno mats at the upstream with damage at the leading edge**.**

Photo 4 – View of the RoW leading to the river with good vegetation cover.

KP 91 Tym River HDD Site and RoW

The HDD site of the northern Tym river crossing is situated in the Tym flood plain in a highly vegetated area. The RoW itself has thick vegetation cover.

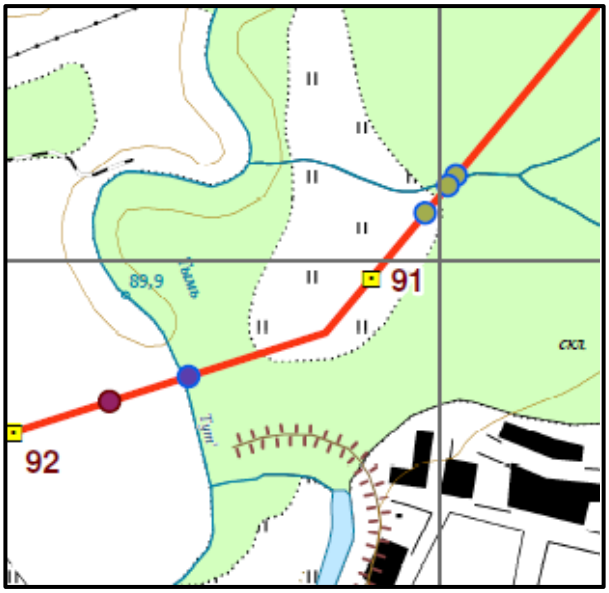


Photo 1 – View north of the RoW in front of the HDD site.

Photo 2 – View of the HDD site.

KP 94.3 RoW North of the Tym River

The RoW at the road crossing is situated just north of the Tym River crossing in the broad river valley/flood plain which has a very good vegetation cover.

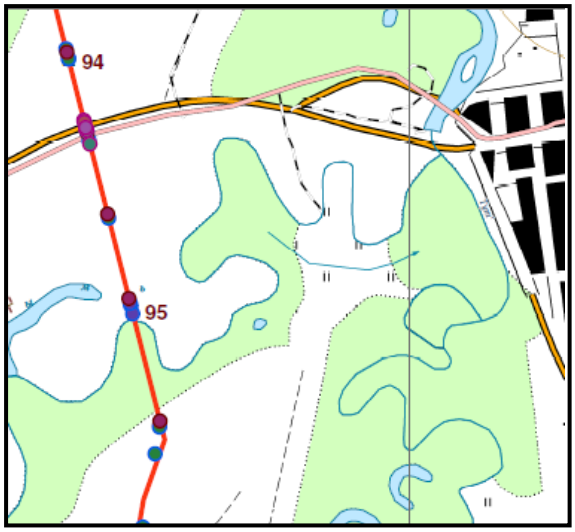


Photo 1 – View to north showing the RoW with good vegetation.

Photo 2 – View to the south toward the Tym river crossing showing RoW with good vegetation.

KP 95 Tym River

The Tym River is situated in a broad flood plain valley which is highly vegetated. The river banks are protected on the north with a gabion wall – the bank is covered with thick vegetation that covers much of the gabions. The southern bank has Reno mats but these were just barely visible on this occasion due to the thick vegetation cover and silt deposit (Photo 1).

The RoW leading to the river from the north has thick vegetation cover (Photos 2 to 4). An area of standing water in a depression on the RoW was noted (Photo 3).

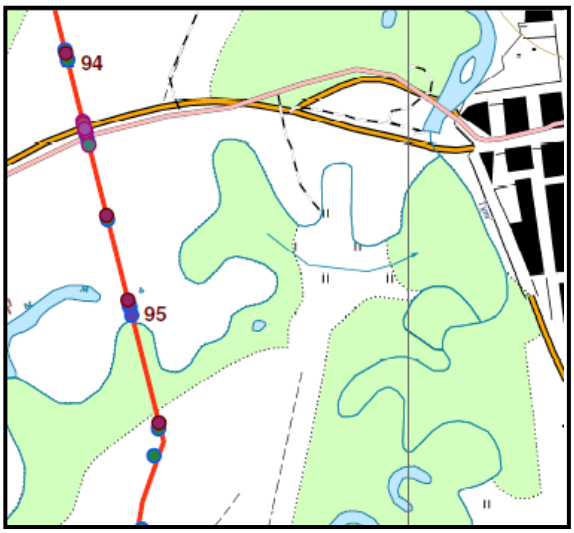


Photo 1 – View south across the river crossing showing bank with good vegetation cover.

Photo 2 – View of the RoW north of the river crossing showing thick vegetation cover.

Photo 3 – View to north showing a depressed area on the RoW with standing water.

Photo 4 – View the RoW north of the crossing showing good vegetation cover.

KP 124 Sandy Slopes

The sandy slopes in this region show mixed results in RoW vegetation cover. The crests of the low hills show mostly poor growth while the lower areas show better growth (Photos 1 and 3). Some of the slope breakers that were observed were misaligned in terms of intercepting flow off the slope and resulted in erosion rills (Photo 2).

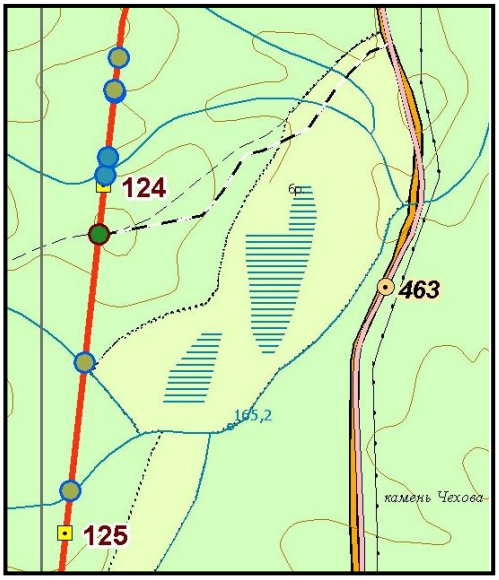


Photo 1 – View to the north showing poor vegetation in the elevated foreground but improved vegetation in the lower elevation.

Photo 2 – View of poor vegetation cover and a misaligned slope breaker with erosion rills parallel to the breaker.

Photo 3 (right) – View to the south showing partially vegetated RoW with poor coverage on the upper elevations and better coverage on the lower elevation.

KP 128 Sandy Slopes

The sandy slopes in this area show general improvement over previous years. To the north from the road crossing the RoW shows good vegetation cover and good slope protection. To the south the vegetation coverage away from the road crossing is spotty and needs to be improved. The final slope south of the crossing shows good vegetation growth.

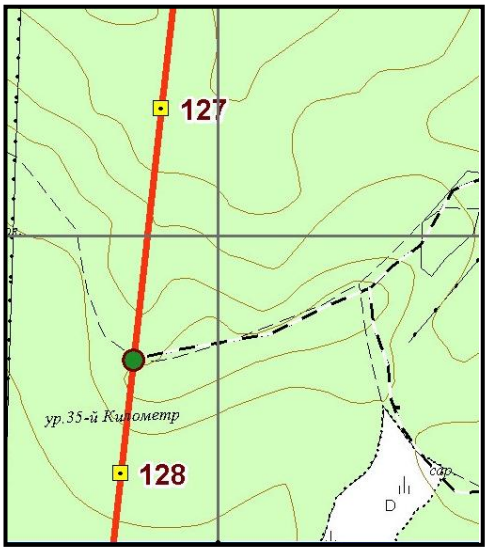


Photo 1 – View to the north showing good vegetation cover and good slope protection.

Photo 2 – View to the south showing sandy slopes with partial coverage.

KP 141 – 143 Taulan Valley RoW

The Taulan River valley is approximately 2 km in width and is mostly a wetland. From the north the RoW slope leading to valley is well vegetated and protected with slope breakers (Photo 1). The valley floor is covered with thick growth of grass (Photos 2 and 3). In the wetland section of the valley the vegetation recovery is quite good with the exception of few bold spots above the pipe trench (Photo 4)

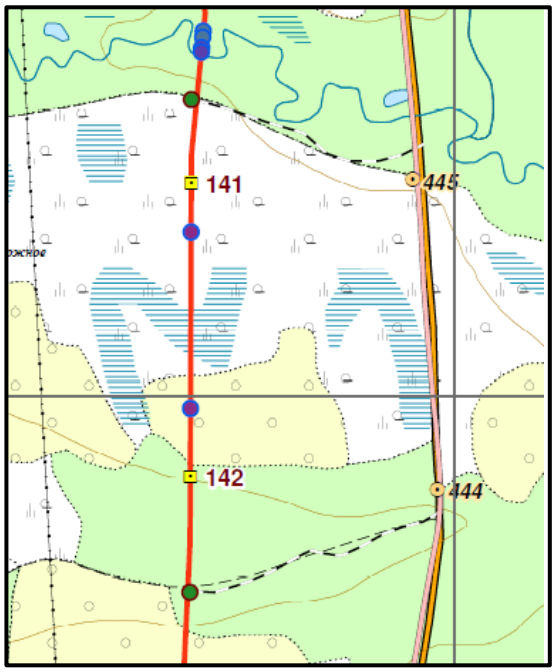


Photo 1 – View north of the Taulan river valley showing good vegetation.

Photo 2 – View to the north showing well vegetated slope above the wetland.

Photo 3 – View to the south showing thick grass cover on the RoW.

Photo 4 – View to the north along the wetland in the river valley showing mostly well recovered vegetation with few bare spots.

KP 143 to 145 Taulanka River Valley and crossing

The Taulanka River valley and crossing RoW is well vegetated. The banks of the river are covered with grass, however where willows were cut the banks are bare (Photos 1 and 2).

The RoW leading to the river from the north is covered with thick grass and the slope is protected with slope breakers.

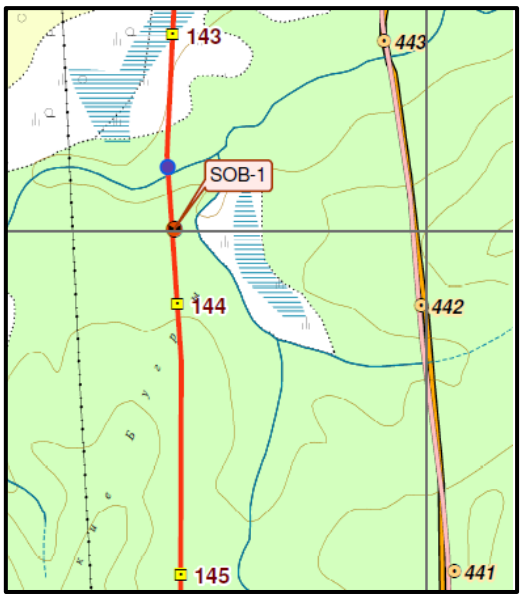


Photo 1 – View to downstream showing good vegetation cover on the banks and with cut willow trees.

Photo 2 – View to upstream showing good vegetation cover on the banks and with cut willow trees.

Photo 3 – View to the north along the RoW leading to the river. Good slope protection and vegetation cover.

Photo 4 – View of the valley floor showing good vegetation cover.

KP 169 Onor River Crossing

The Onor River is a large volume river. The north bank is completely covered with silt and is re-vegetated with grass and willow trees concealing the Reno mats (Photo 1). The south bank has Reno mats in place however approximately in the space above the oil pipe trench there is depression in the bank and should be re-evaluated by maintenance (Photo 2). Willow trees and grass are growing through the Reno matting.

The slope on the south side of the crossing is somewhat stony and not well vegetated. The RoW further to the south has good vegetation cover (Photo 3 and 4).

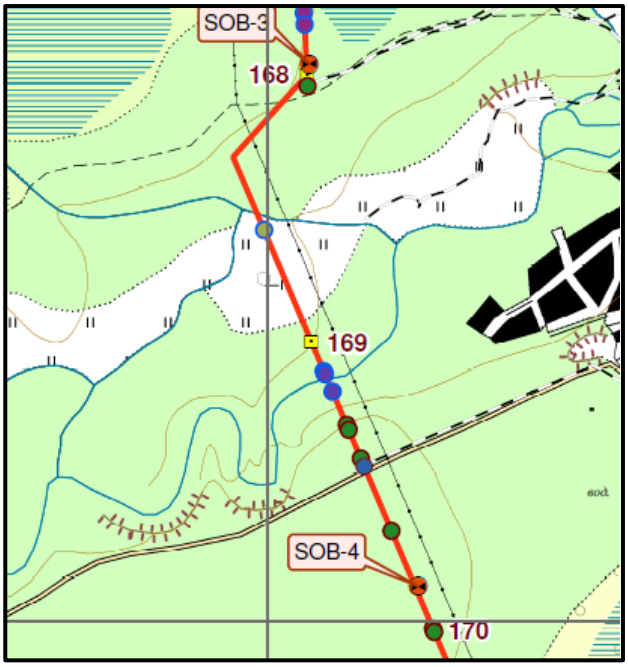


Photo 1 – View across the river to the north showing well recovered northern bank with good silt cover and vegetation.

Photo 2 – View of the southern bank showing Reno mats with vegetation breaking through and a depression above the oil pipe trench.

Photo 3 – View to the north across the river from the access road. The RoW on both sides of the river is well vegetated with the exception of the stony slope. Both slopes are protected by slope breakers. 	**Photo 4** – View to the south from the access road showing moderately vegetated RoW. 

KP 176.3 Sedmaya River Crossing and Slopes

The Sedmaya River crossing is well protected with Reno matting and some vegetation that is growing through the matting (Photos 1 and 2). The RoW to the north has good ground cover and Elder tree saplings. The RoW to the south is well vegetated with grass.

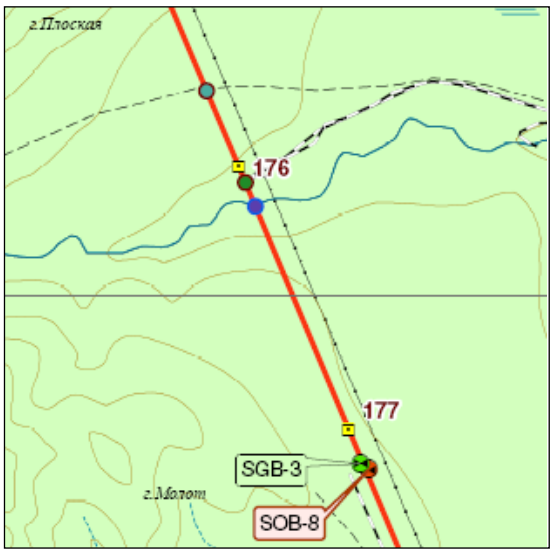


Photo 1 – View to the downstream showing banks covered with Reno mats and some vegetation.

Photo 2 – View to the upstream showing banks covered with Reno mats and some vegetation.

Photo 3 – View to the south across the river.

Photo 4 – View of the RoW to the north.

KP 178.5 Devyataya River and RoW

The RoW at the Devyataya River crossing has a very good ground cover on the level areas along the access road and on the slopes leading to the river. The slopes on each side of the river are protected with well-placed slope breakers (Photos 1 to 3).

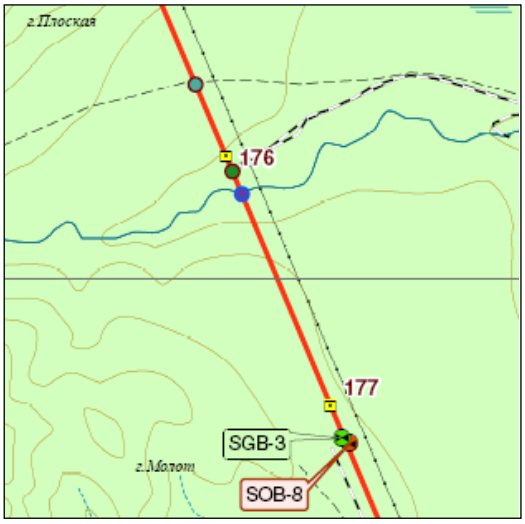
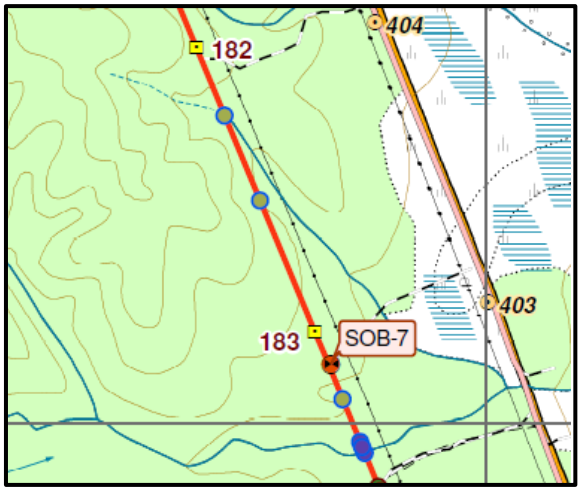


Photo 1 – View south showing Devyataya valley with very good vegetation cover on the RoW and good slope protection.

Photo 2 – View of the RoW north of the river crossing and south of SOB-8.

Photo 3 (right) – View of the RoW north of the river crossing and south of SOB 08.

KP 182.16 Dig Up site, RoW



A pipe inspection/repair dig-up was observed at KP 182.2. The inspection/repair was reportedly one of about a dozen which were performed during the last year. The site was clearly visible since no reinstatement was performed at the surface following the completion of the work (Photo 1). It is recommended that a procedure be formulated for such maintenance activities.

The RoW in the area of the dig-up was very well vegetated at the level surfaces (Photo 2). However, the RoW at this area has steep side slopes (not side cuts) which are protected by geojute (Photo 3). The vegetation on these side slopes is poor and it is recommended that steps are taken to improve the vegetation cover. The geojute has provided stability up to now, but with time it will degrade and the slope will not be protected from erosion unless vegetation takes hold.

Photo 1 – View of the dig-up site.

Photo 2 – View of well vegetated RoW.

Photo 3 (right) – View to the south from KP 182 showing the side slopes with geojute and no vegetation cover.

KP 210 Fault Crossing

The fault crossing at KP 210 shows a reforestation effort of the abandoned section of the RoW – the portion of the RoW that was then by-passed when the new design of the fault crossing was implemented.

The section which is approximately 500 metres long was reforested during the 2011 planting season. The progress to date is shown in Photo 3.

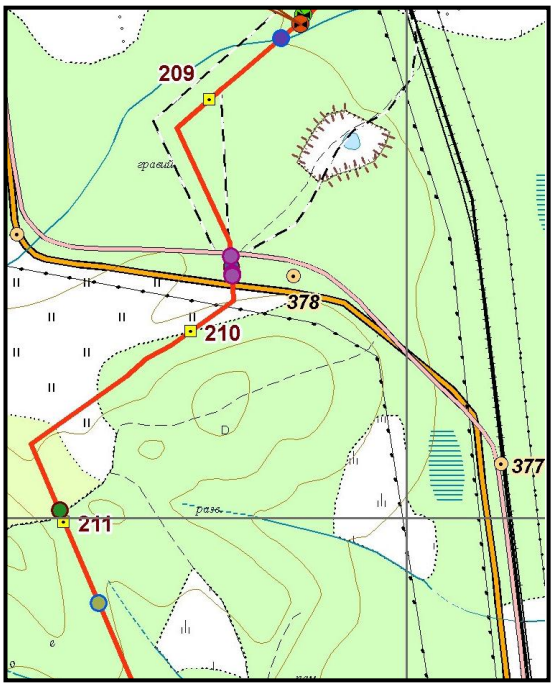
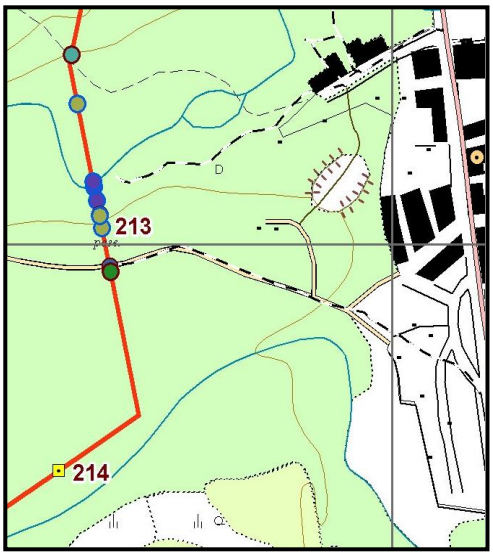


Photo 1 – View to the north of the fault crossing

Photo 2 – View of the RoW to the south of fault crossing showing good ground cover and slope breakers.

Photo 3 (left) – View to the north showing the abandoned portion of the RoW by the fault crossing and the progress of the reforestation.

KP 213 Pobedinka River



The Pobedinka River is a high energy river that required a strong fortification of the outside bank (the southern bank). Currently the southern bank has multi-level gabion wall protection and heavy riprap bank protection that is placed upstream of the crossing at the high impact point of the stream (Photos 1 and 2). The gabion wall shows signs of wear and tear and should be monitored.

The RoW of both sides of the crossing shows good vegetation cover and slopes are protected with slope breakers.

Photo 1 – View to the upstream of the south bank of the river, showing multi-level gabion wall.

Photo 2 – View to upstream showing the heavy riprap protection at the leading edge of the crossing.

Photo 3 – View to across the river from the top of the slope on the south side showing good ground cover on the RoW on both sides of the crossings.

Photo 4 – View to the downstream direction showing the fortified south bank and silted and overgrown north bank.

KP 232 Elynaya River and RoW KP 232 to 238

The Elynaya River crossing shows stable banks well protected with Reno mats and vegetation on the north side and sediment deposit and vegetation on the north side (Photo 1). The RoW leading to the crossing (KP 238 to 232) is very well vegetated and also has growth of many tree saplings some more than 2 metres tall (Photos 2 and 3).

The RoW also includes a bridge that remained from the construction period but had been upgraded since and includes sediment control (Photo 4).

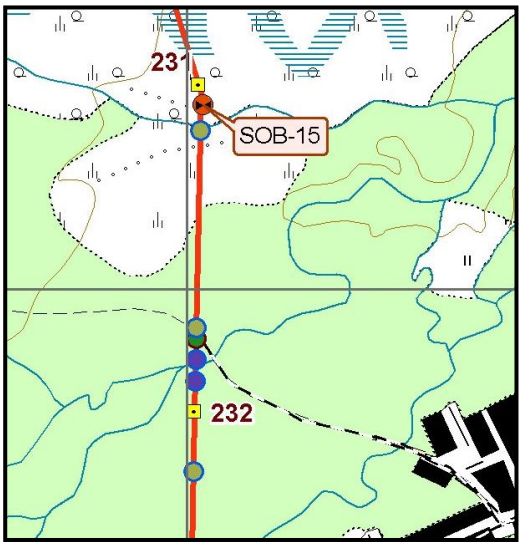


Photo 1 – View to south across the river showing stable bank with Reno mats in foreground and good vegetation cover.

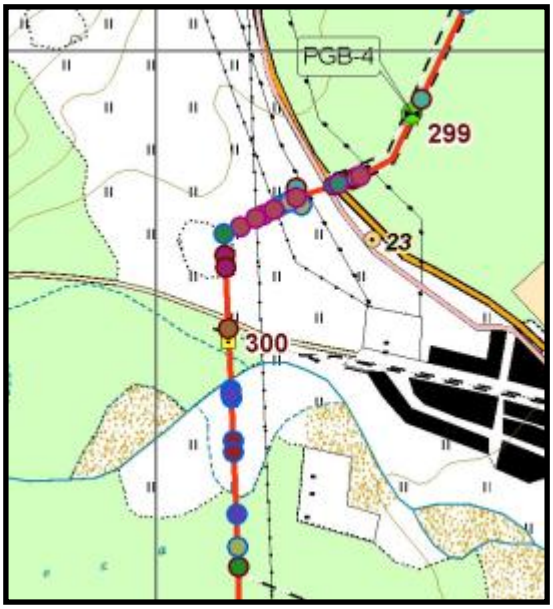
Photo 2 – View of the RoW north of the river with thick growth of tree saplings at least 2 metres tall (reference the KP sign in the photo).

Photo 3 – View of the RoW with thick vegetation cover and including tree saplings.

Photo 4 – View of the RoW with good vegetation and a bridge with sediment protection.

KP 300 Gastellovka River

The Gastellovka river is a high energy braided river with multiple channels. The bank of the northern channel (currently the minor channel) is well fortified against the RoW to the north with Reno mattings which are in good condition (Photo 1). Further south the larger main channel is also fortified with Reno matting that was found to be in good condition (Photo 2).



Downstream of the crossing location on main southern channel, the erosion has occurred in the vicinity of a municipal power line pylon and riprap protection has been installed to help prevent further erosion (we understand that this was installed by Sakhalin Energy (Photo 3).

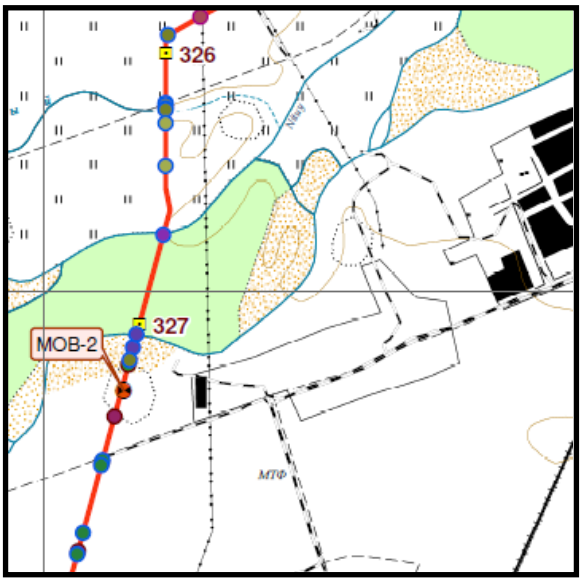
The RoW north and south of the river is well vegetated, although in some places north of the streams, maintenance is required to remove tree growth (Photo 4).

Photo 1 – View of the Reno matts on the north bank of the northern channel.

Photo 2 – View across the river showing Reno matts on the south channel banks.

Photo 3 – Riprap protection around power pylon 	**Photo 4** – View north from Gastellovka River showing well vegetated RoW but with need for tree removal 

KP 327 Nitui River



The Nitui River is a high energy, multi channel braided river. During the September 2012 visit the main southern and central channels were viewed. The southern channel was protected with good size riprap which was found to be in good condition (Photo 1). The central stream is comprised of braiding channels (Photo 2) and good condition riprap is installed on the northern bank (Photo 3). Downstream vehicle tracks were evident on the river bank leading into the stream, which are most probably evidence of salmon poaching.

Good re-vegetation was seen on the riverbanks of both channels and more generally on the sections of RoW adjacent to the channels (Photo 4).

Photo 1 – Riprap on southern channel

Photo 2 – Braiding central stream channels

Photo 3 – Riprap on northern bank of central stream

Photo 4 – View RoW south of southern channel showing very good re-vegetation

KP 334 Turkovka River

The Turkovka River is at the foot of a steep slope to the south that was the subject of significant erosion control issues during the construction period. At the time of the site visit moderate re-vegetation was observed on the south slope (Photo 1). However, vegetation of side cuts near the riverbank showed very limited vegetation (Photo 1) and some erosion was evident on and around drainage on either side of the RoW (Photo 2) and it was likely that this would lead to sediment discharge into the river in the event of heavy rainfall. The south riverbank was protected with reno matting in reasonable condition. The northern riverbank had riprap set back from the channel (Photo 3), presumably to provide protection during high flow periods. Spawning salmon were visible in the river.

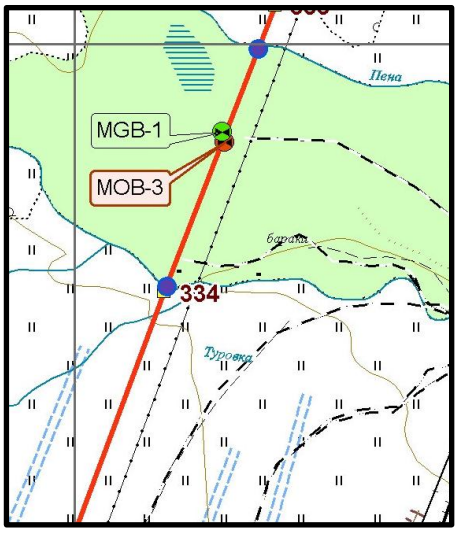
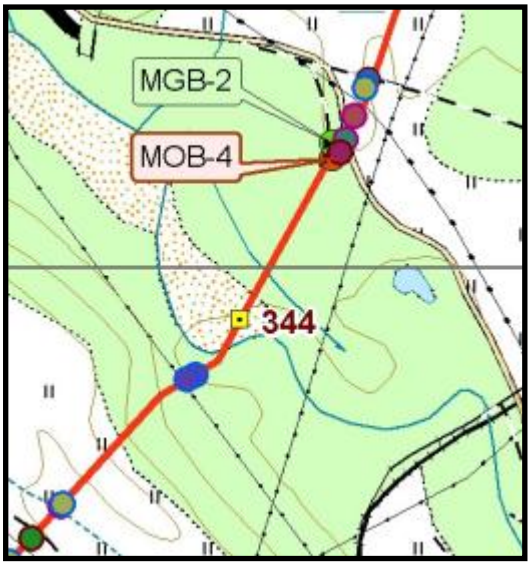


Photo 1 – Moderate re-vegetation on slope to south of river. Note un-vegetated side cut

Photo 2 – Erosion around drainage channel on southern bank

Photo 3 – Riprap on northern bank of river

KP 344 Gornaya River



The Gornaya River is a large meandering River with a tight meander just upstream of the pipeline crossing. During the 2009 typhoon season the river jumped the bank on the upstream meander and was flowing across the RoW north of the crossing. Both the gas pipeline and the fibre optic cable (FOC) were exposed during that time and the situation was treated as an urgent repair by Sakhalin Energy.

Since then, a fortified overflow channel was constructed across the RoW (Photos 1 and 2).

The crossing itself appears intact and the south bank is protected by a gabion wall (Photo 3), which was found to be in generally good condition, although minor damage on the downstream edge of the wall was observed (Photo 4). During the current visit significant re-vegetation on the RoW was observed (Photo 3), but this included significant tree (alder) sampling growth that needs to be removed.

Photo 1 – View of the overflow channel

Photo 2 – View of the overflow channel riprap

Photo 3 – View to the south showing gabion wall protection and very dense vegetation of saplings on the slope across the river.

Photo 4 – Minor damage to downstream portion of gabion wall

Photo 5 – View of reno matting on northern bank.

KP 346.5 Vidnaya River Slope

The Vidnaya River has a very long and steep southern slope of poorly consolidated material. The slopes adjacent to river show moderate re-vegetation with some areas of only sparse growth on sandy soils (Photos 1 to 2).

Significant tree sapling growth was evident along the RoW between the Vidnaya and the Gar rivers and this needs to be removed.

Photo 1 – View of the river crossing, showing moderate vegetation, including tree sapling growth.

Photo 2 – Sparse re-vegetation on southern slope

KP 348.8 Gar River Slopes

The Gar River slopes were observed from the north. The north Slope appeared to be in good condition. Good quality slope breakers, protected with geojute, were present on the northern slope. This combined with a reasonable level of re-vegetation afford a good level of slope stabilisation (Photo 1).

On the southern bank, improved vegetation was visible compared to 2011, especially on the upper portions of the slope (Photo 2). However, the lower portions of the southern slope remain only partially vegetated and there is a need to continue seeding slope and seeding and protecting the side cuts (Photo 3).

Drainage channels at the side of the RoW on the southern slope are armoured with rock, but some wash-out was observed on the eastern side and there was also evidence of minor collapse of reno matting on the southern riverbank (Photo 4).

Control of tree sapling growth is required in the area immediately above the reno matting (Photo 4).

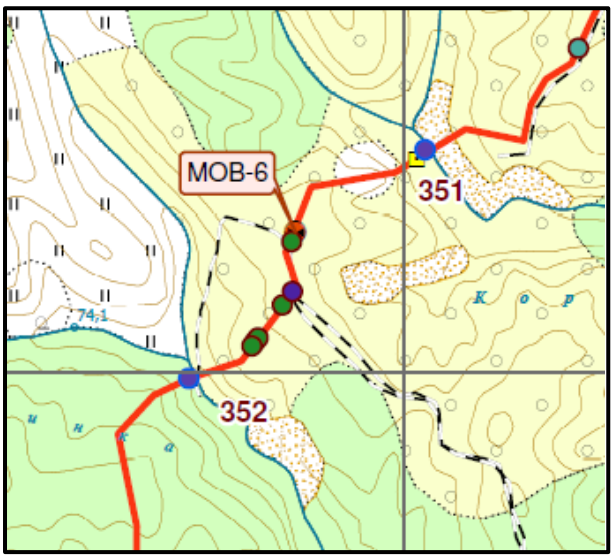
Photo 1 – View northern slope with vegetated RoW with fortified slope breakers.

Photo 2 – View of southern slope showing good re-vegetation on upper portions of slope

Photo 3 – View of southern slope showing more limited re-vegetation on lower portions and side cuts

Photo 4 – View of southern slope showing tree growth above reno matting and also minor failure of the reno

KP 351 Kormovaya River and Slopes



The Kormovaya River crossing has two very steep slopes on its banks. The northern slope is mostly bare and more effort is needed in providing ground cover (Photo 1). The southern slope has some ground cover on the bottom part right above the gabion wall, poor vegetation at the centre part and very good vegetation in the top third of the slope (Photos 2 to 4). The river banks are fortified with gabion walls (Photos 1 and 2) and appear to be holding.

Evidence of sediment from the northern slope running over the gabion wall was noted (Photos 1 and 2). In September 2011, it was noted that the silt fencing was in urgent need of repair or replacement; it appears that this fencing has now completely disappeared and should be replaced to prevent sediment reaching the river.

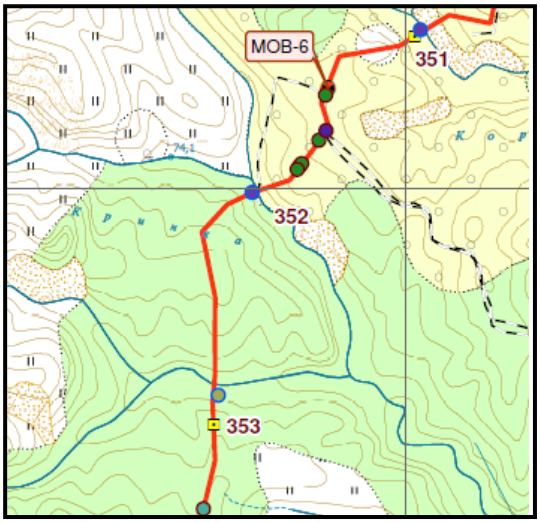
Photo 1 – View to the north across the river showing gabion walls and the north slope with very little vegetation cover. Note sediment flow over the gabion wall.

Photo 2 – View of southern slope with spotty vegetation at the bottom part and with slope breakers.

Photo 3 – View of the central portion of the southern slope shows area of recent repair with new slope breakers.

Photo 4 – View of the upper part of the southern slope (in the foreground) showing good vegetation and tree saplings.

KP 352 Krinka River and Slopes



The Krinka River banks at the crossing are well protected with an extensive Reno mats and some vegetation is coming through the mats Photo 1). The slopes are well protected with slope breakers and with dense vegetation (Photos 2 and 3). The northern slope also has many Elder saplings, some almost 2 metres tall.

An old generator was observed at the BVS MOB-6. It had been was placed on plastic sheeting to help protect groundwater from fuel leaks. It did not appear to be in use and no additional fuel tanks were observed, so the groundwater protection in this instance was deemed adequate.

Photo 1 – View to south showing Reno mats on both banks with some vegetation coming through. Very good vegetation cover on slopes

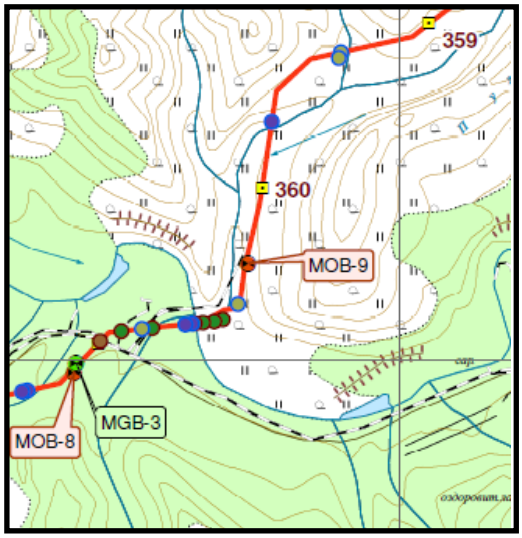
Photo 2 – View to the south showing both slopes with good slope protection and many tree saplings.

Photo 3 (left) – View of tall tree saplings – photo taken at the top of the slope to the north of the crossing.

Photo 4 – Groundwater protection – generator at MOB-6

KP 360 Makarovka River

The Makarovka River is a wide high energy river which during heavy rains and the thaw season flows with high volume. The river banks are protected by gabion walls. The north bank gabion is short on the western side with erosion and damage visible – similar damage was identified in the October 2011 IEC site visit and requires attention (Photo 1). There is also some metal debris (possibly from the construction bridge, on the northern bank that should be removed (Photo 1). The south bank gabion wall is intact (Photo 2) and silt fence above the wall is damaged but is in fact no longer required and should be removed (Photo 3).



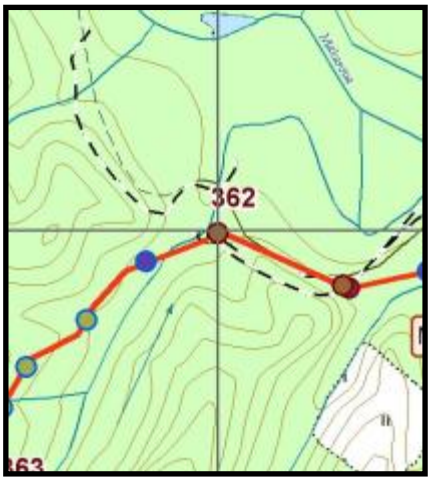
The adjacent RoW on both the northern and southern sides of the river is showing good re-vegetation (Photo 3).

Photo 1 – View to upstream showing damage to the north bank gabion wall and good vegetation behind.

Photo 2 – View south from the river showing the south bank gabion wall and silt fencing

Photo 3 (left) – View showing RoW to north (far side) and south (nearside) of river. Silt fencing visible on south side.

KP 362 Sosnovka River



The Sosnovka River crossing includes the river and adjacent tributary to the north. The tributary crossing is protected with riprap and is currently heavily re-vegetated. The banks at the river crossing are protected with gabion walls and Reno matting which appear in good conditions.

The RoW north and south of the crossing is densely re-vegetated with grass and other.

Photo 1 – View downstream showing Reno matting, gabion walls and the dense vegetation.

Photo 2 – View to the upstream showing Reno matting and gabion walls.

KP 370 Pegas River

The Pegas River crossing banks are protected by Reno matting and gabion walls, and silt fencing is intact (Photos 1 and 2). The RoW on each side of the crossing is densely re-vegetated (Photo 3), although tree saplings are appearing that need to be removed. The slope above the river and MOB 10 block valve is also very well vegetated, although further re-vegetation of the side cut at the top of the slope is still required (Photo 4).

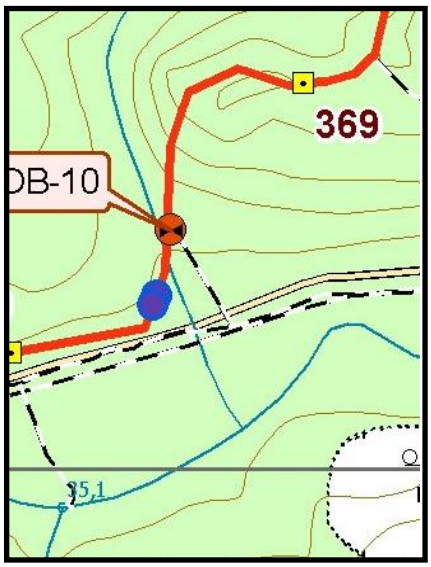


Photo 1 – View upstream showing Reno matting and gabion walls. Also note the dense vegetation.

Photo 2 – View downstream showing Reno matting, gabion walls, and dense vegetation.

Photo 3 – View of RoW to the south of the crossing showing dense re-vegetation.

Photo 4 – View north at the slope above the Pegas showing good re-vegetation.