APPENDIX 1 REVIEW OF HYDROGEOLOGY PERTINENT TO THE RIVER BORJOMOLA CATCHMENTS AND GUJARETIS TSKALI CATCHMENTS, KP 175 – KP 192

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BTC PIPELINE PROJECT
REVIEW OF HYDROGEOLOGY PERTINENT TO THE RIVER BORJOMOLA CATCHMENTS AND GUJARETIS TSKALI CATCHMENTS
KP 175 – KP 192

J W Lloyd, Consultant Hydrogeologist

SUMMARY

Groundwater conditions related to the impact of a hydrocarbon spillage from the pipeline have been examined. It is concluded that groundwater in geological units used for bottled water in the area are not vulnerable. In situations where geological units could be contaminated directly from the pipeline, it is concluded that the hydraulic characteristics are such that contaminant travel times would be sufficiently slow to permit effective remediation.

It is also concluded that water supplies, which draw directly from river valley alluvium in the River Borjomola could be compromised in the unlikely event of an oil spillage.

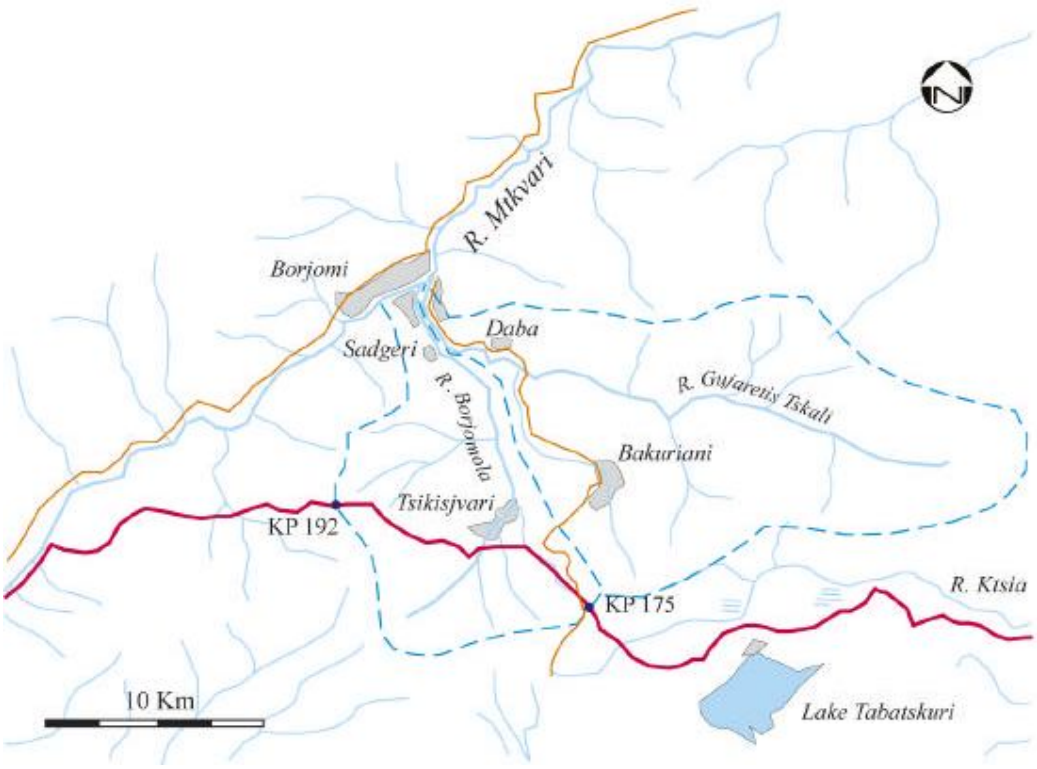
1 AREA OF INTEREST

The area consists of the River Borjomola and River Gujaretis Tskali catchments and is shown on Figure 1, together with the selected right-of-way (ROW) for the BTC pipeline between KP 175 and KP 192. The ROW passes through the River Borjomola catchment and the flows northwards through the town of Borjomi to join the River Mtkvari. The ROW does not cross the Gujaretis Tskali catchment.

Borjomi is renowned as a health spa that has developed through the presence of 'mineralised' water springs. The springs have been harnessed as a resource for the prized Borjomi bottled water. Additionally, 'fresh' water is bottled as part of the Borjomi resource from a spring in the Gujaretis Tskali catchment close to the village of Daba.

Local drinking water supplies are taken from springs discharging from mountain slopes and wells constructed into valley bottom alluvium.

Figure 1 Area of interest



2 HYDROGEOLOGICAL CONCERN

In hydrogeological terms the principal concern is that, as a result of oil spillage during pipeline operations, hydrocarbons will enter the groundwater systems and contaminate the sources that are used for the bottled water resources and local drinking supplies. Spillage is seen as a remote possibility, clearly however, the presence of even a few micrograms of hydrocarbon could negate the water resources, maybe for up to several years.

3 REVIEW OBJECTIVES

The objectives of this review are to:

(i) provide an understanding of the groundwater systems in the area and their vulnerability to oil spillage from the pipeline

(ii) provide recommendations for the way forward

The review is based upon data and reports prepared for the Project by URS and taken from Georgian scientific literature, a visit to the area and discussions with Georgian hydrogeologists and representatives of the Georgia Glass and Mineral Water Company (GGMWC).

4 SCOPE OF REVIEW

The scope of the review is as follows:

(i) an appraisal of the geology and hydrogeology including the material in the Project ESIA

(ii) a discussion of the oil spill impacts and mitigations related to the hydrogeological concepts determined

(iii) comments concerning alternative hydrogeological concepts

(iv) conclusions and recommendations

5 GROUNDWATER SYSTEMS

5.1 GEOLOGY

5.1.1 Introduction

In order to establish a good hydrogeological understanding a reliable geological baseline is essential. The geological sequence and geological distribution in the area are adequately understood, although for some of the formations, as discussed below, the drilling data are sparse.

The general geological sequence is given in Table 1 and the geological distribution, based mainly upon a collation of pre-existing data made by URS for the Project ESIA, is shown in Figure 2. The ESIA geological database is considered adequate for a hydrogeological appraisal, although some additional supportive data have been obtained for this review, together with field observations. The geological detail given in the ESIA need not be repeated here. Comments pertaining to groundwater system characteristics, however, are included.

Minor modifications to the pre-existing geological map have been made to the Quaternary lava distribution in the vicinity of Tsikisjvari, based upon Project investigations. The map shown Figure 2 includes these changes.

Table 1 Geological succession

Age	Rock Types	Approximate Maximum Thickness, m
Recent	Alluvium: variable grade	10
U.Pliocene-M.Quaternary	Lavas: basalts, dolerites, andesites, dacites	250
U.Pliocene	Alluvium: variable grade	10
L.Miocene-U.Eocene	Lagoonal and lacustrine: clays, marls, sandstones	200
M.Eocene	Volcano-clastics: breccias, tuffs, lavas, Clays, sandstones	4000
L.Eocene-Palaeocene	Flysch: marls, clays	1400
U.Cretaceous-L.Palaeocene	Calcareous: limestones, marls	1500
L.Turonian	Volcanics	

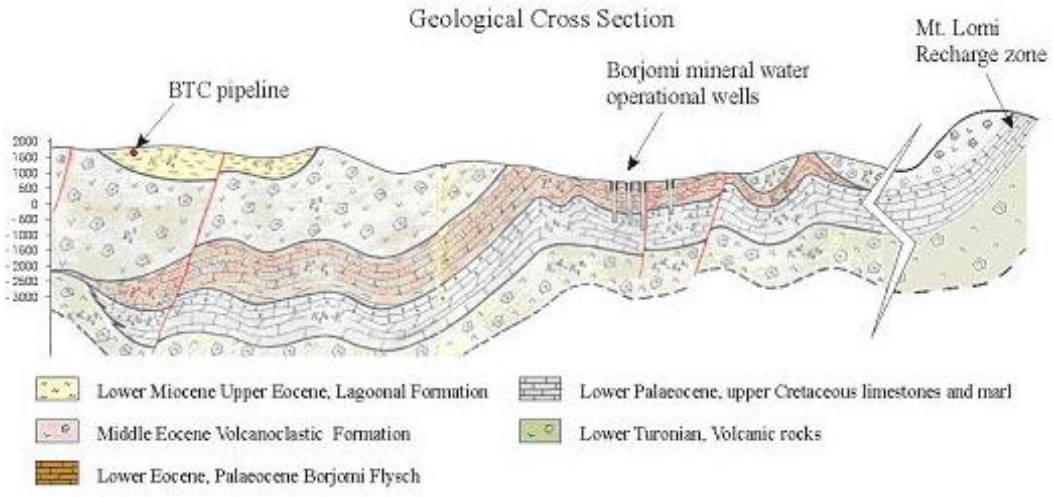
5.1.2 Pre-quaternary sequence

Figure 3 shows a north-south cross section through the region. The Turonian volcanics occur beneath a thick Cretaceous calcareous unit that outcrops in the Ajara-Imereti mountains and dips southwards below the Borjomi area before 'pinching out' to the south. Although consisting dominantly of bedded limestones, it is lithologically variable and includes beds of marl. It does not outcrop in the catchments of the Borjomola, or Gujaretis Tskali.

Overlying the Cretaceous a flysch sequence is present that is multi-bedded and dominantly argillaceous in character but contains subsidiary sandstones. A volcano-clastic unit overlies the flysch and consists of breccias, tuffs and some lavas.

The flysch and the volcano-clastics outcrop extensively in the Borjomola and Gujaretis Tskali catchments.

Figure 3 Geological cross-section for area of interest



Locally, in the vicinity of Tsikisjvari lagoonal and lacustrine deposits occur overlying the volcano-clastics.

The Pre-Quaternary sequence has been subject to structural deformation on both large (km) and small (m) scales. As can be seen from Figures 2 and 3 anticlinal and major fault features have evolved, mainly during the Alpine orogeny (Miocene – Pliocene), but probably during more than one deformation period, with reactivation. Two major thrust faults are present in the vicinity of Bakuriani and Tsikisjvari (see Figure 2).

The deformations have imparted a well-developed regional fracture to the Pre-Quaternary sequence that is clearly visible at outcrop. Intensive fracturing is postulated to be present in anticlinal structures and adjacent to major faults (URS, 2002).

Following the structural disruption of the area uplift resulted in the establishment of sub-aerial conditions and erosion. Valleys were formed running from Bakurani and Tsikisjvari to Borjomi; the proto-Borjomola. Drilling evidence shows the presence of some 10m of alluvium, that are assigned to Upper Pliocene deposition in the proto valley, beneath Quaternary lavas GEOLOG (2002) suggest that the alluvium can be identified from surface geophysical data, however in view of the large thickness and variable electrical properties of the lavas, this type of identification is questionable. The character and distribution of the alluvium is therefore not known, but it is unlikely to be extensive laterally, and may be assumed to be similar in distribution to Recent alluvium (see below) and constricted to old river courses. It has possibly also been disrupted be the Quaternary lava extrusion.

5.1.3 Quaternary and Recent sequence

On Figure 2 it can be seen that Quaternary lavas have been locally extruded. The lavas are predominantly basic consisting of basalts and andesites, but also include dacites. Some sands and clays are reported in inter-flow zones. The understanding of the general distribution of the lavas appears to be satisfactory. As noted in Section 5.1.1, some modifications to the lava distribution mapping has been carried out as part of the BP Project in the valley section immediately downstream of Tsikisjvari. There are very limited drilling data for the unit. A borehole to the immediate south of Daba penetrates 230m of lava below some 10m of superficial deposits. The lavas sit astride the major Bakuriani fault that passes through the area so possibly evolved as fissure extrusions associated with the fault, which is currently seismically active, although not subject to displacement.

The Quaternary lavas of most importance to this discussion are those present in the interfluve separating the River Borjomola catchment downstream of Tsikisjvari and the Gujaretis Tskali catchment to the east. The elongate north-south shape of the lava pile demonstrates its extrusion into the proto-Borjomola valley. This hypothesis is supported by the presence of sub-lava alluvium in the borehole noted in Section 5.1.2 above. Details of the lavas disposition are shown in a set of geological cross-sections included in Appendix I. The sub-lava alluvium thought to be variably present beneath parts of the lavas is not included in these cross-sections because no information exists about its distribution.

At outcrop the lavas exhibit classical jointing. Quasi-columnar vertical joints occur with local intensive zones of sub-horizontal jointing.

Thin superficial Recent variable grade alluvial deposits are present in the valley bottoms throughout the area. The Recent superficial deposits, however, have not been mapped.

If the Borjomola and Gujaretis Tskali interfluve lava pile was formed as postulated above, then it is possible that unmapped Quaternary-Recent lacustrine deposits occur in the broad valley area at Tsikisjvari as a consequence of valley blocking.

The post-extrusion erosion along the River Borjomola has occurred principally in the softer volcano-clastic rocks in preference to the very much harder Quaternary lavas.

5.2 HYDROGEOLOGY

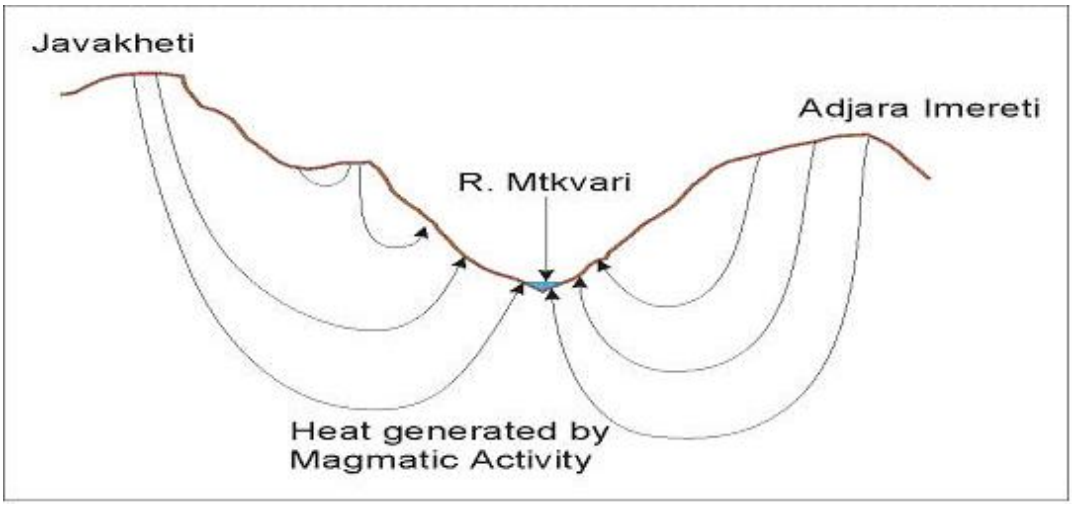
5.2.1 Introduction

The part of Georgia of interest to this discussion is seen as being dominated hydrogeologically by the Ajara-Imereti mountains to the north and the Javakheti Plateau and mountains to the south. In regional groundwater terms the River Mtkvari is believed to act as a sink to the overall flow system as shown schematically on Figure 4, following the principals advanced by, for example, Hubbert (1940) and Toth (1980). Volcanic activity, principally in the Javakheti Plateau has been a feature of the region as late as the Quarternary and it is postulated that magmatic activity still provides a heat source at depth and a additional hydraulic head drive to the groundwater system.

Recharge from precipitation is considered to occur across the region with high hydraulic heads imparted in the mountain ranges. Heads decline towards the River Mtkvari, but because of the flow distributions, hydraulic heads increase with depth below the river basin. The head and flow distributions will be modified locally by geology, but the overall pattern will persist. The modifications can consist of local confinement, preferential upward flows in zones of fractured ground and possibly some convectional flow at depth. Most geological units within the region can be seen as being 'leaky'.

Irrespective of the regional flow pattern, recharge from precipitation throughout the area will be significant, as exemplified by the presence of many springs and perennial surface water flows. The hydrogeological characterisation of the area is therefore seen as being classical for a high recharge terrain with the free surface groundwater distribution (water table distribution) mirroring topography.

Figure 4 Schematic representation of the regional groundwater system



Locally, recharge from precipitation and surface water runoff will mix local at shallow levels with regional flows moving from depth. However, in view of the unconfined groundwater distribution mirroring the topography it is considered that these shallow mixed groundwaters are

discharged to the surface water systems, which act as groundwater sinks, and such groundwaters do not move to depth because of the upward pressures described above.

In the following hydrogeological discussion only the four groundwater situations of principal interest will be considered. The specific geological units concerned are given in Table 1. The groundwater situations relate to:

(i) groundwater in the Cretaceous calcareous sequence, which is used by the GGMWC as a 'mineralised' source

(ii) groundwater in volcano-clastic and lagoonal and lacustrine deposits along the pipeline ROW

(iii) groundwater in the Quaternary lavas in the interfluve of the Borjomola and Gujaretis Tskali catchments used by the GGMWC as a 'fresh' source and also used as local drinking sources

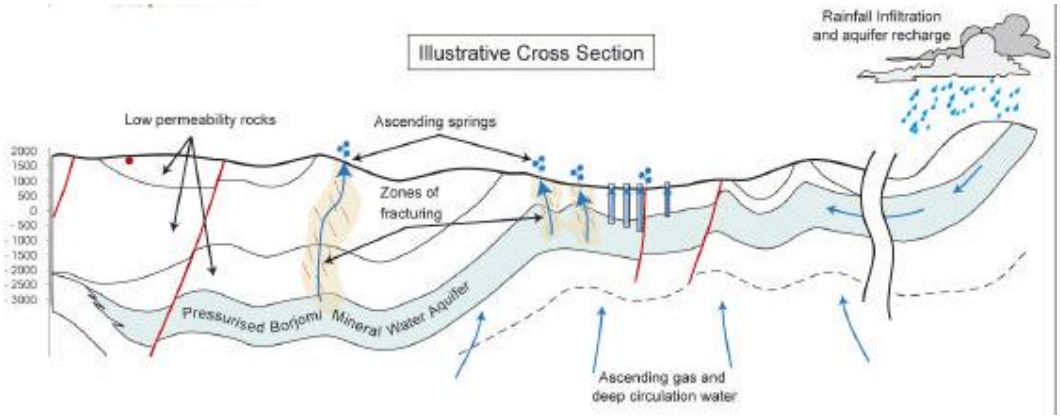
(iv) groundwater in valley alluvium in which is intimately linked to surface water and from which some local water supplies are obtained

5.2.2 Cretaceous 'confined' system (i)

The disposition of this system is shown on Figure 3. The ROW does not cross the system. The limestones etc are characterised hydraulically by fracture porosity and probably locally by dissolution porosity. The porosity will be highly variable as a consequence of the variable lithology and strata competence and the manner in which the rocks have responded to stress. In consequence hydraulic conductivity (permeability) will be very variable. In the context of the regional flow system postulated in Section 5.2.1, the significance of the Cretaceous strata is that they provide a potentially a better groundwater yielding unit than other strata in the sequence.

Recharge from precipitation and surface water run-off occurs at the Cretaceous outcrop in the Ajara-Imereti mountains at elevations up to 2,000m ASL. As can be seen from Figure 3, however, there is no outcrop discharge zone specifically for the Cretaceous unit. Consequently, the discharge occurs vertically through the overlying fractured flysch deposits, as part of the overall regional flow. In view of the dominantly argillaceous and multi-bedded character of these deposits the porosity continuity will be limited and less than in the underlying Cretaceous rocks. Hence, resistance to upward groundwater flow in the flysch will cause pressure (groundwater hydraulic head) to build-up in the Cretaceous. In hydrogeological terms the Cretaceous system in this interpretation is seen as 'leaky' rather than exclusively confined, with the pressure build-up a function of the regional flow and a 'geological time' phenomenon. A conceptual flow characterisation for the system is shown on Figure 5.

Figure 5 Concept of groundwater flow associated with the Cretaceous strata

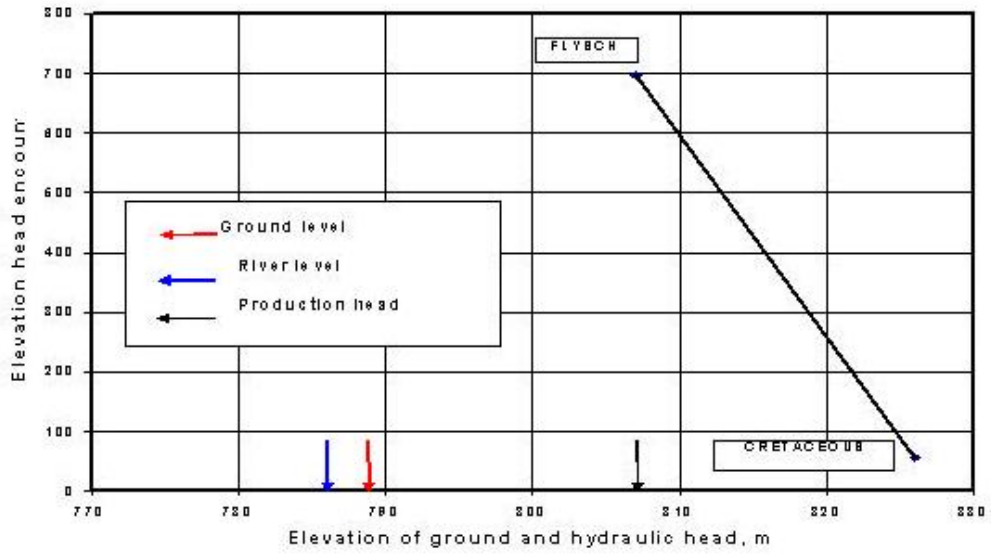


In the south (Figures 2 and 3), the upward leakage will enter the volcano-clastic rocks from the flysch and high heads (about 1,700m) are recorded in thermal springs in the vicinity of Tsikisjvari, in boreholes at Bakuriani. The driving forces in this area are attributed to recharge in the Javakheti Plateau and mountains.

Records show that spring waters in the vicinity of Borjormi and groundwaters in wells drilled to intercept the 'leaky' discharge from the Cretaceous unit contain CO_2 and other gases in slightly abnormally high concentrations. The groundwaters in the system are also variably 'mineralised' with total dissolved solids concentrations ranging up to about 5g/l and have temperatures above ambient. It is hypothesised that the CO_2 etc originates partly from gas fluxes moving upwards from depth, below the Cretaceous rocks, as a consequence of remnant Quaternary volcanicity, together with some 'mineralised' fluid fluxes.

In terms of 'mineralised' groundwater resource exploitation, GGMWC maintain flowing artesian conditions at Borjomi. That is to say that, for example, head in the main production well (BH 41) is maintained with positive head of about 18.5m (approximately 807m ASL) at the production site above ground level (788.8m ASL) and above the river level. BH 41 is 130m deep and cased to a depth of 91.8m. Yields vary between about 130 and 160m^3/day. It draws its groundwater from the flysch. A near-by borehole penetrates to and draws from the Cretaceous in which a head of 826m ASL is recorded (33m above ground surface). The relationships between the hydraulic heads at Borjomi and ground level and river level (approximately 787m ASL) are shown on Figure 6. 'Mineralised' groundwater heads are obviously above river level.

Figure 6 Hydraulic head relationships at Borjomi



5.2.3 Volcano-clastic and lagoonal deposits along the pipeline ROW (ii)

Figure 2 shows that from about KP 175 to KP 182 the ROW passes through volcano-clastic deposits. The porosity of the deposits is considered to be dominantly a fracture porosity. They contain shallow unconfined groundwater derived from recharge locally from precipitation and may also contain mineralized groundwaters originating from depth as discussed in Section 5.2.1. The shallow groundwaters are seen in terms of head control and flow distributions as according with the topographically driven concept described in Section 5.2.1. Discharges from the deposits occur locally to the surface water courses.

From KP 182 to KP 192 the ROW is through lagoonal-lacustrine deposits that because of their lithological character are seen as having very small primary porosity and hydraulic conductivity. Very shallow unconfined groundwater is present with locally, surface saturated ground. As with the groundwaters in the volcano-clastic deposits the hydraulic head and flow distributions are controlled by topography with discharge to local water courses.

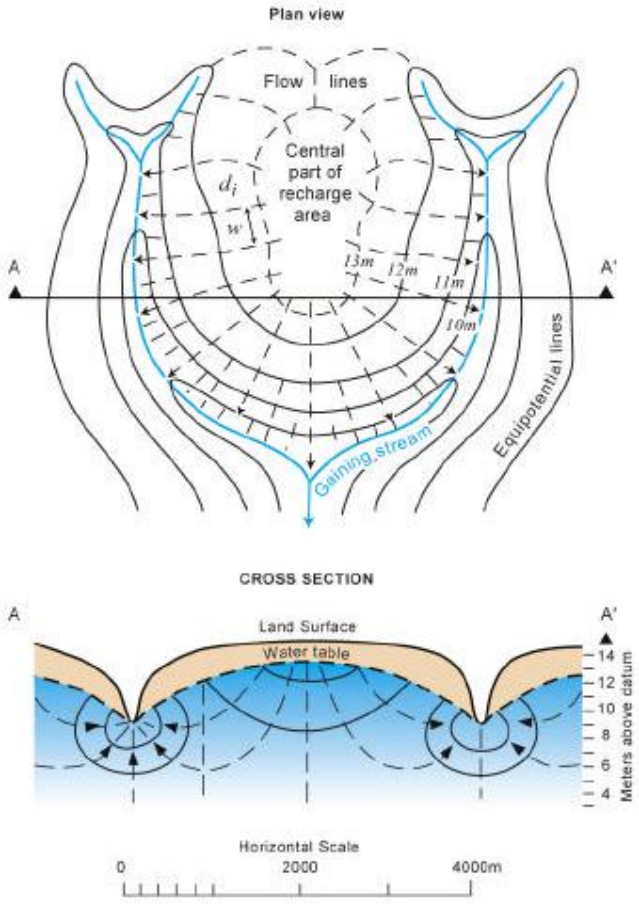
5.2.4 Quaternary lava unconfined system (iii)

The ROW does not cross this system. Hydraulically the lava pile is controlled by the porosity imparted by the joint/fracture features described in Section 5.1.3 above, which it is considered are in variable continuity throughout the pile. The lavas are considered to be in hydraulic continuity with the local Upper Pliocene alluvium (see Section 5.1.3) and underlying units. Hydraulic parameter data are not available for the Upper Pliocene alluvium, but judging from its mode of deposition, they are likely to be very variable. Springs are present at a number of localities in the lavas in the Borjomola - Gujaretis Tskali interfluve and are considered to reflect

unconfined conditions, reflecting topography as indicated on Figures 7 and 8. The topographical hydraulic head drive is seen as controlling groundwater flows, which are considered to be to the rivers throughout the area, irrespective of the geology.

The porosity and consequent hydraulic continuity in the lavas are undoubtedly very variable so that locally very rapid groundwater velocities may develop at times and major fracture zones may exert some control on flow volume distributions and rates. The fact that spring discharges are maintained perennially however, shows that the bulk porosities that dominate are small, such that gravity release of the groundwater is relatively slow.

Figure 7 Flow net theory of groundwater flow to rivers (after Heath, 1983)



5.2.5 River Valley Alluvium (iv)

Alluvium is present throughout the river valley bottoms in the area and will provide variable hydraulic continuity with the underlying bed rock systems. As the alluvium has not been mapped the thickness is not known, however it is thought to vary up to about 10m. Because of the topographic positions of these deposits they act as part of the river sink for the groundwaters

discharging from the bed rocks. There will undoubtedly be an intimate association between groundwaters in these deposits and surface water in the associated rivers. Under certain head-flow conditions the deposits will be recharged from the river flows, and under other conditions groundwaters in the deposits will discharge from the alluvium to the rivers. Groundwaters in the deposits can originate from any of the geological units depending upon the local geological conditions.

It is understood that the Tsikisjvari drinking water supply, and possibly part of the Borjomi supply, are drawn from these alluvial deposits and it is likely that smaller communities also use groundwaters from the alluvium.

6 HYDROGEOLOGICAL IMPLICATIONS OF OIL SPILLAGE

6.1 INTRODUCTION

Two aspects of oil spillage and subsequent groundwater contamination are considered below:

(i) spillage into a surface water course and subsequent hydrocarbon entry into a groundwater system

(ii) spillage into a groundwater system directly from the pipeline

6.2 SURFACE WATER COURSE SPILLAGE

Irrespective of any mitigation procedures put in place it is probable that with the occurrence of a spillage some dissolved phase hydrocarbon, at least, will pass down rivers. In the context of the area under discussion this means that the Borjomola catchment water courses could be vulnerable to spillage. The Gujaretis Tskali catchment is not vulnerable as it is separated from the pipeline by the intervening valley of the River Ktsia.

The groundwater systems discussed above in Sections 5.2.2, 5.2.3 and 5.2.5 are discussed below with respect to their association with the water courses in the Borjomola catchment.

6.2.1 Vulnerability of the Cretaceous 'confined' system

Any vulnerability of this system concerns the 'mineralised' groundwaters and GGMWC bottled production (Section 5.2.2). Groundwaters from the system are not otherwise used.

The production sites for the 'mineralised' groundwaters are some 16km from the pipeline along the course of the Borjomola River. Any hydrocarbon contaminant in the river water, or associated alluvial groundwater, would be significantly diluted by the time it came within the vicinity of the GGMWC flowing wells, which draw groundwater from the flysch. Most importantly however, the upward pressure driving the 'mineralised' groundwaters from depth will ensure that shallow groundwater, or river water will not enter the production wells, as indicated on Figure 6. Further, the rivers act as sinks so that groundwater gradients are naturally towards the rivers.

The susceptibility of the GGMWC wells to contamination may be viewed in the context of current production practice. Heads are maintained above ground surface, however a drawdown is being imposed on the system. As discussed in Section 5.2.2, the shallow groundwaters in the flysch will be typically mixed with recharge from precipitation. In the vicinity of Borjomi, the recharge will undoubtedly be contaminated by urban pollutants. For example, the town only has a partial sewage system. If shallow groundwater were capable of entering the production wells, records would show variable hydrochemistry, probably seasonally and probably with contaminants. This is understood not to be the case, showing that under the production criteria applied the flysch groundwaters being abstracted are from the deep circulation system and are not compromised by any local recharge. Such would be the situation in the unlikely event of a pipeline spillage.

6.2.2 Vulnerability of the Quaternary lava unconfined system

This system (Section 5.2.4) is addressed in this Section because of the usage of springs at Sadgeri for the Borjomi water supply and a spring source at Daba by GGMWC for bottled water.

The general conceptual groundwater flow directions for the lavas are shown on Figure 8. As discussed in Section 5.2.4, with unconfined conditions pertaining, a groundwater divide will exist between the Borjomola and Gujaretis Tskali catchments. Figure 9 shows schematically the groundwater flow through a cross section across the two river valleys.

Recharge to the lavas is considered to be substantial. URS (2002, Appendix E-IV) estimate that an annual rate of the order of 300mm/annum/km^2 occurs generally in the Borjomola and Gujaretis Tskali catchments, which is equivalent to a discharge of 9.5 l/sec/km^2. Such large recharge it is considered would permanently maintain a groundwater divide in the interfluve between the two rivers.

A proportion of the recharge would appear to discharge at the upper Sadgeri spring (Figure 8), located at an elevation of 1,012m in the gorge well above Borjomola river level. Flow data for the springs complex are very limited, but flows of possibly up to 60 l/sec may occur. The main, or lower spring, which is used for the Borjomi water supply, however occurs at an elevation of 991m adjacent to the river at an interface between volcano-clastic materials and river terrace alluvium.

It is considered that the discharge in the upper Sadgeri spring is derived totally from the lavas, which are recharged from the unconfined interfluve between the Borjomola and Gujaretis Tskali rivers. The head conditions that are considered to exist in the interfluve are such that hydrocarbon contamination from the Borjomola river (Section 6.2) cannot enter into this Sadgeri spring and therefore the spring is not vulnerable to any potential spillage.

As can be seen on Figure 8 the Daba spring is in the Gujaretis Tskali catchment area. Hydraulic head is available from only one local borehole head, however from the concept shown on Figure 9 it is concluded that the spring derives its flow from the lavas on the Gujaretis Tskali side of the interfluve.

To examine the significance of the spring yield for which reliable data are available, the maximum yield of 182m^3/day (2.1 l/s) recorded by GGMWC in July, 2002 has been assumed as an annual yield (ie 66,430m^3/year). The recharge requirement would be equivalent to 66mm/year/km^2.

Figure 8 Groundwater situation in the Quaternary lavas in the vicinity of Sadgeri and Daba

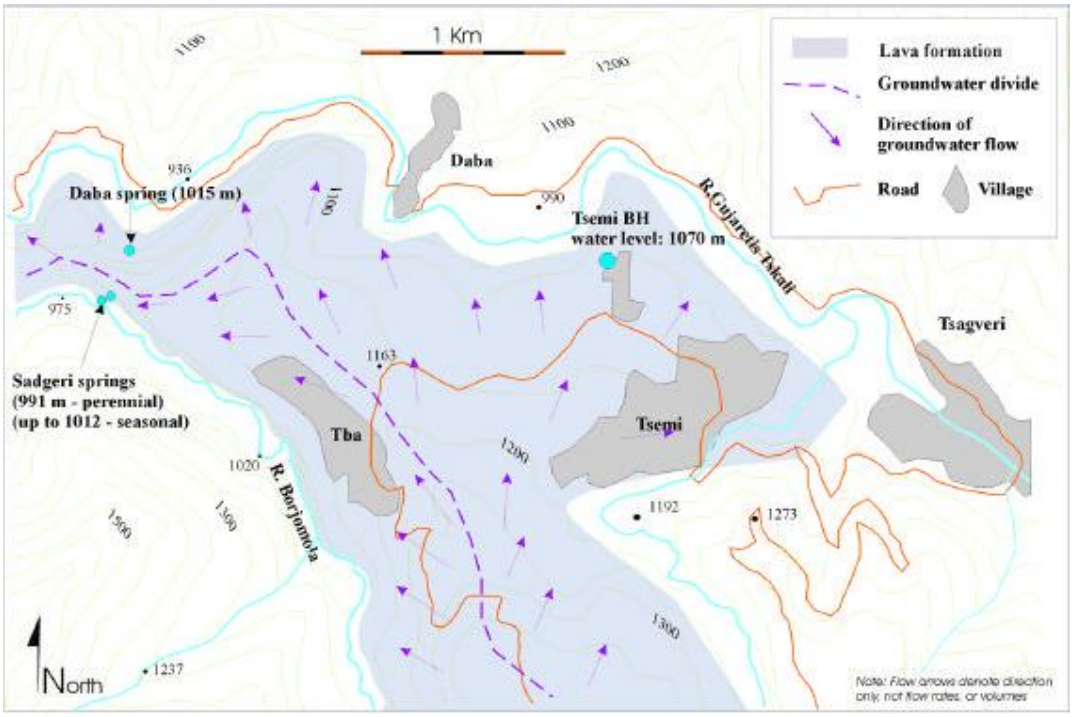
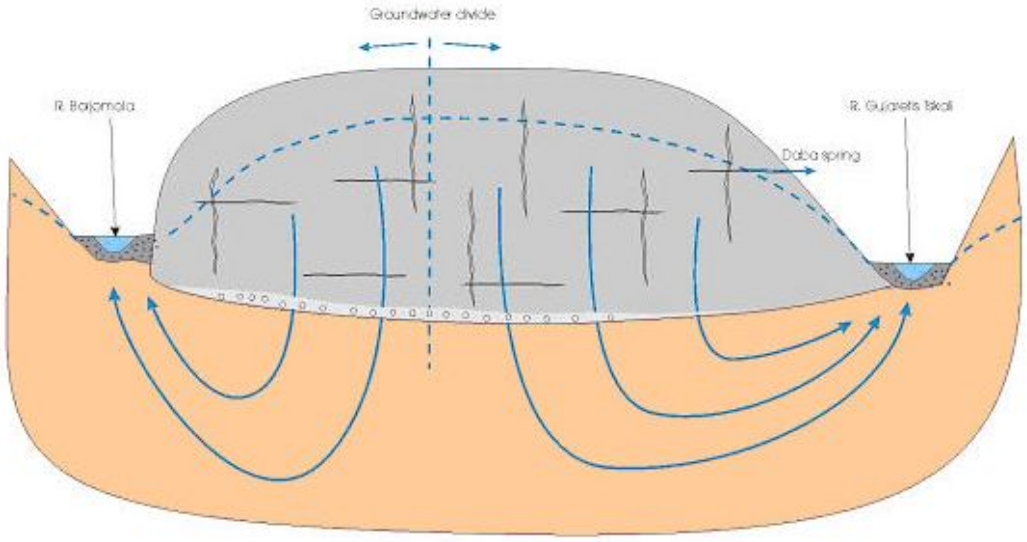


Figure 9 Schematic Groundwater flow through a cross section across the river valleys



From the recharge estimates given by URS above, it is concluded that the Daba GGMWC spring can logically be fully recharged locally from the lava on the Gujaretis Tskali side of the interfluve and from ground that cannot be subject to any potential hydrocarbon contamination by the Project. The Daba spring cannot receive recharge from the River Borjomola (see Section 6.2.3 below), which could be vulnerable to hydrocarbon spillage, because of an intervening groundwater divide and as noted in the introduction to Section 6.2 the Gujaretis Tskali catchment is not vulnerable, because it is separated from the pipeline by an intervening valley.

6.2.3 Vulnerability of the Borjomola River Valley Alluvium

As noted in Section (5.2.5) there is an intimate relationship between river water and associated alluvium groundwater so that hydrocarbons moving down the water courses in surface water could enter the groundwater in the alluvium. It is clear that water supplies based on such groundwater could be at risk. The main, or lower Sadgeri spring, used for the Borjomi water supply, and referred to above in Section 6.2.2 is thought to fall into this category.

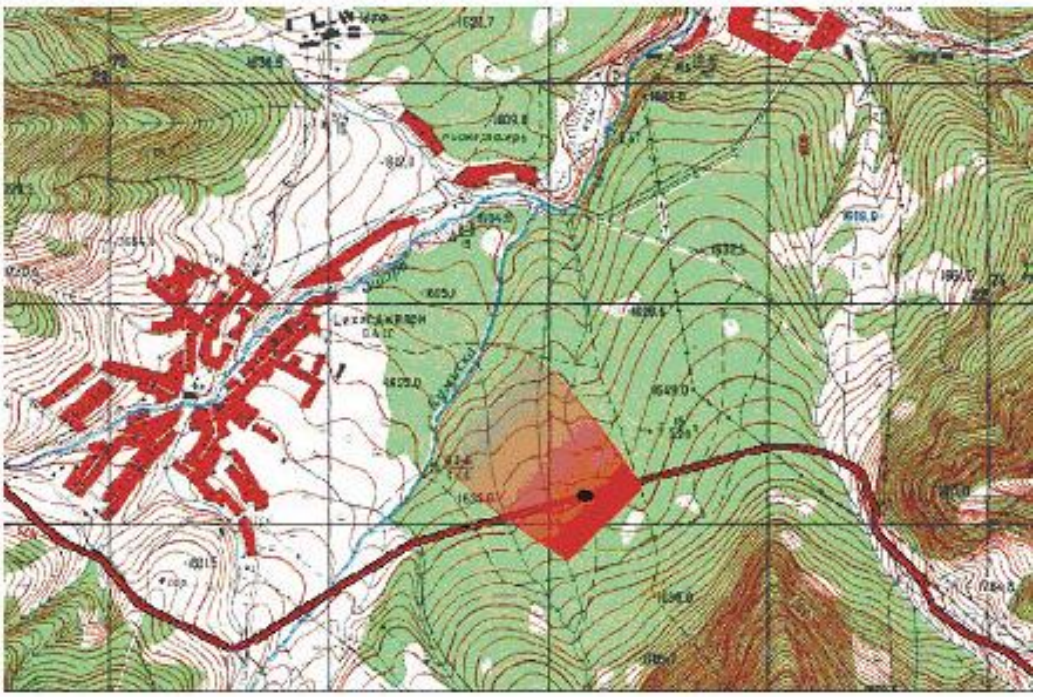
6.3 SPILLAGE DIRECTLY INTO THE GROUNDWATER

This spillage scenario is where oil could move directly onto the top of the water table without moving through an unsaturated zone. The scenario is more extreme than one including an unsaturated zone as unsaturated zone retardation is excluded.

6.3.1 Vulnerability of volcano-clastic and lagoonal-lacustrine deposits along the ROW

This scenario has been addressed in the ESIA (URS, BTC ESIA, 2002, Appendix E, Annex IV, Site 11, KP 182), with respect to initial spillage into the volcano-clastic deposits. An internationally accepted contaminant transport equation has been applied. The results of the calculations are shown on Figure 10.

Figure 10 Extent of a 0.01mg/l hydrocarbon concentration after 6 months following a 12,000m^3 oil spillage into the volcano-clastic deposits



The dominant parameter in the analysis is permeability, for which very conservative values have been adopted. The results show that for a uniform permeability of 100m/day, which is an unrealistically high value, with a full bore spillage of about 12,000m^3 of oil (approximately 7,000 tons) it would take about 6 months for the dissolved hydrocarbon phase at a concentration of 0.01mg/l to move approximately 1km. This demonstrates the even at a very high spillage volumes the contaminant would not move rapidly in the groundwater system and there would be more than adequate time to undertake remedial measures.

Permeabilities in the lagoonal-lacustrine argillaceous sediments will be at least an order of magnitude less than those analysed for the volcano-clastic deposits so that contaminant travel times will be significantly slower.

It may be concluded that if spillage were to occur directly into the volcano-clastic, or the lagoonal-lacustrine deposits, the contaminant travel times would be sufficiently slow to allow remediation to be carried out.

To the immediate west of the modelled spillage area shown on Figure 10, the pipeline runs approximately along the trace of southernmost of the two thrust faults in the area (see Figure 2), between KP 182 and KP 183. This situation has not been analysed hydrogeologically as the local hydraulic character of the fault is not known. However, it has been assumed that an oil spillage in this sector would move directly to the local stream and as such has been analysed in surface water terms in the ESIA in Appendix E, Annex IV of that report. Remediation for such a spillage would follow normal BP procedures, including groundwater clean-up if found to be necessary.

7 COMMENTS ABOUT ALTERNATIVE HYDROGEOLOGICAL CONCEPTS

The hydrogeological interpretation described above incorporates much of the current understanding of the region. It is understood, however that there are hydrogeological concerns relating to the 'mineralised' groundwater and to the groundwater controls on the Daba spring used for the GGMWC 'fresh' water supply. Comments are given below.

7.1 CRETACEOUS 'CONFINED' SYSTEM

The concept adopted in Section 5.2.5 is for a universally 'leaky' system. It is understood that other concepts include leakage exclusively through constricted zones such as faults and highly fractured features, and compartmentalised areas in which lateral hydraulic continuity does not occur, or is severely limited. Documented detailed explanations of these concepts have not been provided.

The constricted zones concept infers that away from these zones the system is confined. In the context of hydrocarbon contamination of the system it would be impossible for contaminant to move down through the confining strata. If, for example, the Borjomi production area was considered as a constricted flow zone the same head situation as postulated for the 'leaky' concept in Section 6.2.1 would apply. Because heads emanating from the Cretaceous would be higher than those in the water courses any hydrocarbon being carried down the water courses would not enter the 'mineralised' groundwaters and in any case the rivers act as sinks.

It is understood that concerns have been raised that hydrocarbon contamination could move down fault zones into strata yielding the 'mineralised' groundwaters. In view of the increases of groundwater hydraulic head gradient with depth, this is not plausible.

It is possible that compartmentalised 'mineralised' groundwater bodies occur. Irrespectively, as there appears to be no evidence that such compartments exist with abnormally low heads, in the context of a possible pipeline oil spillage it is difficult to understand a logical physical situation whereby the 'mineralised' groundwaters could be compromised.

7.2 QUATERNARY LAVA UNCONFINED SYSTEM

It is understood that suggestions have been made that the Daba spring is hydraulically influenced by the River Borjomola, possibly through the Upper Pliocene alluvium. In Section 6.2.2 the groundwater conditions for the Daba area are discussed, and are shown on Figure 8, using GGMWC information. It is concluded that the spring is recharged from the Gujaretis Tskali side of the Quarternary lava interfluve and that adequate recharge occurs to satisfy the spring discharge. Further, it is concluded that because a permanent groundwater divide, that is considered to control flows both in the lavas and any sub-lava alluvium present, separates the spring from the River Borjomola, the spring cannot be in contact with that river and therefore would not receive contamination if present in the river. On the basis of these conclusions it is difficult to contemplate the validity of the suggestion.

8 CONCLUSIONS

Four hydrogeological conditions in need of discussion have been identified in the area:

(i) groundwater in the Cretaceous calcareous sequence, which is used by the GGMWC as a 'mineralised' source

(ii) groundwater in volcano-clastic and lagoonal deposits along the pipeline ROW

(iii) groundwater in the lavas in the interfluve of the Borjomola and Gujaretis Tskali catchments used by Borjomi as a water supply and the GGMWC as a 'fresh' source

(iv) groundwater in valley alluvium in which is intimately linked to surface water and from which some local water supplies, such as that for Borjomi, are obtained

It is concluded that in the event of a pipeline spillage the following groundwaters will not be compromised:

- the Cretaceous system (i)
- the lavas in the interfluve between the Borjomola and Gujaretis Tskali catchments (iii)

It is concluded that in the event of a spillage into the volcano-clastic and lagoonal deposits along the pipeline ROW (ii), the hydrogeological characteristics are such that contaminant travel times would be sufficiently slow to permit effective remediation

It is concluded that water supplies drawn from river valley alluvium in the River Borjomola (iv), could be contaminated by any hydrocarbons in the river waters.

9 RECOMMENDATIONS

It is recommended that groundwater pressure and drilling log data be obtained for some of the existing boreholes related to the Cretaceous 'Confined' System (see Section 5.2.2), in order to extend the Project database. Some of this data collection is already in hand. It is not considered relevant for the Project to carry out any drilling, or comprehensive hydrogeological analysis of this system.

Local political considerations are outside of the scope of this review, however it is understood that there could be a lack of agreement with the Georgia Glass and Mineral Water Co. about the sensitivity of the Daba spring (see Section 6.2.2). As a 'fall-back' situation BP may wish to consider proposals to assist GGMWC in identifying an alternative source.

For the volcano-clastic and lagoonal-lacustrine deposits along the ROW (see Section 6.3.1), it would be sensible to devise a shallow groundwater monitoring well programme. The wells would only be for leak detection. In the event of a spillage, a remediation well would needed in the contaminated area in order to clean up the oil.

In view of the conclusions concerning the Borjomola alluvium groundwaters, there is a need to carry out a survey of water supply installations in order to identify locations and populations that draw from these groundwaters. The results of the survey should help determine the pre-Project baseline.

Before the pipeline operates it is recommended that the Project establishes a baseline hydrochemical analysis and monitoring programme. The purpose of the baseline data would be to safeguard the Project in the event of a spillage in terms of claims of degree of contamination. Further, other hydrocarbon sources almost certainly exist in the area and the distinction between contamination from such sources and possible pipeline spillage should be distinguished. The extent of such a programme needs to be considered.

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Appendix I

Detailed Geological Cross-Sections

Location Map

APPENDIX II ANNEX I PHASE II BOTANICAL REPORTS

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APPENDIX II ANNEX I PHASE II BOTANICAL REPORTS

1 INTRODUCTION

Detailed floristic and syntaxonomical surveys were undertaken at a number of sites along the proposed route, which were identified as particularly sensitive to pipeline construction and operational activities based on previous studies. These sites are as follows:

- Tetri Tskaro Area
- Wetlands in the vicinity of Mountain Tavkvetili and river Ktsia upper reaches
- Narianis Veli wetlands
- Route section from Tskhratskaro pass to village Tsikhisjvari
- Route section from the vicinity of village Sakire to river Potskhovi east crossing
- Vicinity of Postkhovi west crossing.

The surveys continued from spring to autumn 2001-2002. The survey findings could have some limitations as duration of the fieldwork to compile botanical inventories was limited while flowering / fructification periods of various plant species vary substantially from January to November.

A key objective of the floristic and phytosocioligal research was to identify and collect quantitative data on plant communities and species of high conservation value that occur immediately or in close vicinity of the RoW.

The areas of high botanical interest, which are still part or located in the vicinity of the proposed pipeline corridor, are described below. These areas are shown on Figures II-15 - 23.

2 METHODOLOGY

An internationally recognised standard methodology has been used in assessments of the botanically important and sensitive areas. Sample plots to study important syntaxonomical units along the proposed route in sensitive areas were determined by selective sampling. This involved subjective selection of the sampling plots identified to be representative of a community type or containing a special feature such as species of high conservation value. Sizes of the sample plots in forest, scrub and meadows were determined according to the recommendations of Tüxen (1970). Minimal sample plot area is $400m^2$ for deciduous forests, $100m^2$ for scrub and wetlands, and $10m^2$ for meadows. Preference was given to the square shape of the sample plots. As the pipeline route goes through various types of habitats, it was divided into sections each crossing more or less uniform plant community. GPS (Global Positioning System) co-ordinates of the start and end points of sections were recorded and the length of each section was measured using GIS (Geographical Information System).

Cover (%) was estimated as the percentage of ground occupied by a perpendicular projection of the aerial parts of the species. Cover was measured by the method of a visual estimation. A 10-point Domin scale of cover-abundance (see Table II-1 below) was used to avoid underestimation of the importance of species with scattered individuals (Morris & Therrivel, 1995).

Table II-1 Domin scale of cover abundance

Points	Cover-Abundance
+	One individual, reduced vigor
1	Rare
2	Sparse
3	<4%, frequent
4	5-10%
5	11-25%
6	26-33%
7	34-50%
8	51-75%
9	76-90%
10	91-100%

The criteria recommended by Morris & Therivel (1995) were used when assessing the importance of various plant communities (refer to Table II-2). Primary forests, which were thought to be remnants of primeval forests, were given a high conservation value.

Table II-2 Summary of criteria recommended by Morris & Therivel

Conservation Value			
Criterion	**High**	**Medium**	**Low**
Species richness	High species richness noted or likely to occur. Endemic or threatened species included in the Georgian Red Data Book and/or IUCN Red List recorded or likely to be present	Medium species diversity. Few rare or threatened species	Very low species diversity and almost no threatened species that may be affected
Naturalness and level of modification	Natural or slightly modified habitats	Moderately modified habitats eg those which can still support characteristic species assemblages	Heavily modified habitats
Human disturbance	Very little or no human disturbance	Little human disturbance	High human disturbance (heavy grazing, forest felling, etc)
Rarity and geographical location of habitat	Rare or endangered habitat in the country or region.	Not so common habitat in the region	Common habitat. Areas near human settlements

3 DETAILED BOTANICAL SURVEYS IN TETRI TSKARO AREA

3.1 INTRODUCTION

In spring (late April) 2001 a detailed botanical assessment of the study area was undertaken in by Georgian ecologists Dr. Mamia Loria (Tbilisi Central Botanical Garden) and David Kikodze (Institute of Botany of Georgian Academy of Sciences). In September 2001 additional field study of the re-route developed in July 2001 has been conducted by the same experts.

The Study area comprises a section of the proposed pipeline route from village Daget-Khachini to the southern edge of Bedeni plateau, Tetritskaro administrative district. The pipeline route section crosses agricultural fields, scattered shrubbery, forest margins, various types of forests and mountain meadows. The altitudes range from 800 to 1700 m AMSL. A total length of the pipeline route section from the start point at the proposed river Geti crossing location to the edge of Bedeni plateau is approximately 20 km.

3.2 SURVEY RESULTS

Forests are the most important habitats of high conservation value in the study area. Although all forests and woodlands are sensitive towards pipeline construction activities, the primary forests developed on the southern slope of Bedeni Ridge and the park-like forests developed from the south-east of Cherepanovka lake to the southern edge of Bedeni Plateau are of particularly high conservation value. These forests are mostly dominated by high-mountainous oak, included in the Red Data Book of Georgia (GRDB). The forests of high-mountainous oak used to be widespread in Georgia, but are declining now due to heavy human impact. The regeneration rate is very low, and almost no saplings and seedlings were observed in these forests during the survey.

Figure II-1 High-mountain oakwood

Important forest communities are also those dominated by beech (Sites 9, 18). A small fragment of beech forest was discovered approximately 200m west of the proposed RoW (Site 21). Pure beechwods are very rare in Tetritskaro region. Therefore, the above fragments are of high conservation value due to rarity on a regional level.

The forests developed along the route section from the Geti crossing to the Chiv-chavi crossing are of secondary origin, developed on the areas once occupied by primary forests of Georgian oak. These communities are heavily impacted by grazing, logging and tree cutting for firewood as they are located in the close vicinity of settlements and man-made landscapes.

Table II-3 below provides a list of the forest types studied and their conservation values.

Table II-3 Forest types surveyed and conservation value

Site No.	Forest Type	Conservation Value
1	Degraded Georgian Oak Forest with abundant growth of shrubs	Low to Medium
2	Degraded/Secondary Georgian Oak Forest	Low to Medium
3	Secondary Georgian Oak Forest with Oriental Hornbeam	Low to Medium
4	Secondary Georgian Oak Forest with admixture of High-Mountainous Oak	Low to Medium
5	Secondary Georgian Oak Forest with admixture of High-Mountainous Oak	Low to Medium
6	Primary Georgian Oak Forest with Admixture of High-Mountainous Oak	High
7	Fragment of Riparian Forest	High
8	Secondary Caucasian Hornbeam Forest with Admixture of Oaks	Low to Medium
9	Beechwood	High
10	Secondary Caucasian Hornbeam Forest with Admixture of High-Mountainous Oak	Medium
11	Primary High-Mountainous Oak-Caucasian Hornbeam Forest	High
12	Secondary Caucasian Hornbeam-High Mountainous Oak Forest	Medium
13	Secondary High-Mountainous Oak Forest	Medium
14	Secondary Thinned High-Mountainous Oak Forest	Low to Medium
16	Secondary High-Mountainous Oak Forest	Medium
17	Primary High Mountainous Oak-Caucasian Hornbeam Forest	High
18	Beechwood	High
19	Thinned High-Mountainous Oak Forest	Low to Medium
20	Thinned High-Mountainous Oak Forest	Low to Medium
21	Fragment of Beech Forest with Caucasian Hornbeam	High
22	Park-Like High-Mountainous Oak Forest	High
23	Park-Like High-Mountainous Oak Forest	High

Full information on representative sample plots is given in Annex II Detailed Floristic and Phytosociological Description of Sample plots. Their location relative to the proposed route is shown on Figure II-15.

Although the re-route developed in July 2001 avoids the site where the population of Georgian endemic pasqueflower (*Pulsatilla georgica*) was recorded during the spring survey, it still passes through the similar habitat. Due to late season it was not possible to identify pasqueflower individuals within the proposed RoW that crosses through the meadow community. However, based on the similarity of conditions and proximity to the pasqueflower occurrence, it is anticipated that the amended route will still have an impact on the fragile populations. *Pulsatilla georgica* is a dwarf herbaceous plant up to 10cm in height with densely pubescent leaves, stems and petals. Pasqueflower is regarded as a local endemic as it is known to grow only in three localities in Georgia within the Trialeti area (Gagnidze&Davitadze, 2000).

Figure II-2 ***Pulsatilla georgica*** **in flowers**

4 DETAILED BOTANICAL SURVEYS IN WETLANDS OF MOUNTAIN TAVKVETILI AND RIVER KTSIA UPPER REACHES

4.1 INTRODUCTION

In September 2001 a detailed assessment of the ecologically important wetland patches located immediately within the proposed pipeline RoW at the eastern base of Mt. Tavkvetili was undertaken by Georgian ecologists Dr. Mamia Loria (Tbilisi Central Botanical Garden) and David Kikodze (Institute of Botany of Georgian Academy of Sciences). In addition to the above fragments, a number of important wetland habitats are found within the area, from the north-west of village Kizil-Kilisa to Tskratskaro Pass. It is not anticipated that majority of the wetlands will be affected by the pipeline construction and operation. However, in July-August 2002 another assessment was conducted to collect field data on the wetland floristic composition and plant community structure. In parallel, the sites investigated in 2001 were surveyed to complete botanical inventory. The 2002 field data has been supplemented by information contained in the unpublished manuscript "Vegetation of Georgian Wetlands" by late Dr. Kukuri Kimeridze, kindly provided by his family.

The study area comprises approximately 28km long section of the proposed pipeline route on Javakheti upland. The route section crosses the high mountain habitats mostly dominated by meadow vegetation with patchy distribution of Rhododendron scrub and wetland communities.

4.2 SURVEY RESULTS

Detailed inventories of 11 wetland sites were compiled. All higher plant species and those of bryophytes were recorded and quantitative data on community structure was collected.

Almost all wetland communities are quite poor in higher plant species; the highest number of associated species (15) has been observed on Site 1. The most complex wetland structure was found on the western shore of lake Tabatskuri (Site 7) where various econiches are occupied by different communities dominated by Sedge, Common Reed and Shining Pondweed with a very limited number of associated vascular plant species. An extremely rare species of Georgian flora - *Carex wiluica* was found on sites 1, 5, 9 and 10. This species is known to occur on Javakheti upland and is of limited ecological plasticity. It is associated exclusively with the alpine wetlands and known only from the area under the consideration. Absolute majority of the investigated sites could be characterized as fens, or peat-producing wetlands, which are influenced by soil nutrients flowing through the system. Sedges and grasses, with mosses are the dominant vegetation.

Figure II-3 High-mountain wetland view, west bank of lake Tabatskuri

Sites 1, 2 and 3 are crossed by the currently preferred pipeline route, which will cause their fragmentation and further almost complete degradation. Sites 8 and 11 are in the immediate vicinity of the proposed RoW edge and potentially will be impacted by pipeline construction and operation activities as these may cause changes in the groundwater table and lateral flow. It is anticipated that project works will have any impact on the other surveyed wetland fragments as they are not located within the pipeline RoW or in the immediate vicinity.

All sites except Site 11 were given high conservation value as the wetlands are rare plant communities in the high-mountains of Georgia with patchy distribution (Kimeridze, 1963), are under permanent anthropogenic influence and have very low restoration potential. Site 11 is considered as of medium to high conservation value as in some parts it is used as hay meadow by the local population.

Table II-4 Wetland types surveyed and conservation value

Site #	Community Type	Distance from the p/l centerline (m)	Conservation Value
1	Sedge Dominated Wetland with Tufted Hair-grass and Mat-grass	0	High
2	Sedge Dominated Wetland with Mat-grass	0	High
3	Sedge Dominated Wetland with Mat-grass	0	High
4	Tufted Sedge Dominated Wetland	380	High
5	Sedge Dominated Wetland	520	High
6	Sedge Dominated Wetland with Common Duckweed	420	High
7	Sedge-Common Reed-Shining Pondweed Dominated Wetland	1260	High
8	Water Crowfoot Dominated Wetland	240	High
9	Sedge Dominated Wetland	910	High
10	Sedge Dominated Wetland	780	High
11	Sedge Dominated Wetland	130	Medium to High

Full information on representative sample plots is given in Annex II Detailed Floristic and Phytosociological Description of Sample plots. Their location relative to the proposed route is shown on Figures II-16 - 18.

Figure II-4 View of high-mountain wetland, vicinity of Mt. Tavkvetili

5 DETAILED BOTANICAL SURVEYS AT NARIANIS VELI WETLANDS

5.1 INTRODUCTION

A detailed botanical assessment of Narianis Veli wetlands was conducted by Georgian ecologists David Chelidze (Institute of Botany of Georgian Academy of Sciences) and Dr. Shalva Sikharulidze (Bakuriani Alpine Botanical Garden) in May 2001.

The studies took place in early vegetative phase when identification of a number of species is difficult and sometimes even impossible. It is well-known that the sedge species (*Carex*) can be recognized by small technical differencies, especially in details of the structure of perigynium (a special bract - a specialized leaf from the axil from which a flower arises. It encloses the achene - type of dry fruit of *Carex*). Thus precise measurement of mature perigynium and achene may be necessary for accurate identification whilst immature specimens are often not keyable.

Therefore, it was recommended that the survey be repeated in mid July in order to obtain full floristic description of the area. Taking into consideration vulnerability of high-mountain wetlands, the proposed corridor was re-routed outside the area. However, for the purpose of completeness of botanical inventories, the area was resurveyed in July-August 2002, within the scope of the studies of Mt. Tavkvetili and river Ktsia wetlands.

The study area comprises the former section of the proposed pipeline route crossing Narianis Veli wetland in the river Ktsia valley, enclosed by Mountains Tavkvetili to the south-east and Shuana Mta to the north-west. The original marshes survive only in fragments due to construction of drainage canals. Additional disturbance is related to the presence of roads. The area is mostly used for grazing, mowing and hunting. A total length of the pipeline route section is approximately 3 km.

5.2 SURVEY RESULTS

The remnants of the former sedge-dominated marshes are the most important habitats of high conservation value in the study area.

In total, five representative plots of various plant communities were surveyed. Three sites (NN 2, 3 and 5) were classified as being of high conservation value as they comprise wet meadows supporting high diversity of plant species. The level of human modification of these rare habitats is relatively low. A total length of sites of high conservation value to be crossed by the proposed route is approximately 933 m.

Populations of two endemic species of the Caucasus – primrose *Primula luteola* and gentian *Gentiana angulosa* were found to grow on Site 2.

Primrose *Primula luteola* (family Primulaceae) is a perennial decorative plant reaching 15 – 25 cm in height. The mass flowering period is May – July. Flowers are of light yellow colour. It occurs on wet meadows, marshy areas and in the vicinity of springs in the alpine zone.

Populations of an endemic species of the Caucasus – *Scilla rosenii* was found on Sites 3 and 4. *Scilla rosenii* (family Liliaceae) is a decorative bulbous plant (geophyte) reaching 7 to 10 cm in

height. It grows in the sub-alpine meadows and upper mountainous belt. The flowering period is May.

Site 5 supports a large population of an endemic species of the Caucasus – *Thymus grossheimii* and approximately 10 individuals of rare species lychnis *Dactylorhiza euxina*. *Thymus grossheimii* (family Labiatae) is a perennial with purple flowers. The mass flowering period is June-July (no flowering individuals were observed during the survey). It occurs on meadows in the sub-alpine and alpine zones. Lychnis *Dactylorhiza euxina* (family Orchidaceae) is a perennial with purple to violet flowers, reaching 15 – 40 cm in height. The mass flowering period is June-July. It occurs on wet meadows in sub-alpine and alpine zones.

Figure II-5 Wetland at Narianis Veli

Table II-5 below provides a list of the vegetation types studied and their conservation values. Full information on representative sample plots is given in Annex II Detailed Floristic and Phytosociological Description of Sample plots. Their location relative to the proposed route is shown on Figure II-19.

Table II-5 Community types surveyed and conservation value

Site No.	Community Type	Conservation Value
1	Overgrazed Meadow	Medium
2	Wet Meadow	High
3	Wet Meadow	High
4	Wet Meadow (with a drainage canal)	Medium
5	Grazed Meadow	High

6 BOTANICAL SURVEYS FROM TSKHRATSKARO PASS TO TSIKHISJVARI

6.1 INTRODUCTION

A detailed survey of the area was conducted by Georgian ecologists Prof. Giorgi Nakhutsrishvili (Director of the Institute of Botany, Georgian Academy of Sciences) and Dr. Shalva Sikharulidze (Bakuriani Alpine Botanical Garden) in May 2001.

The study area comprises the proposed route section from Tskhratskaro Pass to Kodiana Pass, approximately 7 km north-west of village Tsikhisjvari. The pipeline route section crosses alpine meadows, various types of primary forests and scrub. The altitudes range from 1,700 to 2,500 m AMSL. A total length of the pipeline route section surveyed is approximately 17 km.

6.2 SURVEY RESULTS

In total, sixteen representative plots of various plant communities were surveyed. Forests are the most important habitats of high conservation value in the study area. Six sites (NN 2, 5, 10, 12, 13 and 14) were classified as being of high conservation value as they comprise primary crook-stem birch forests and beech forests with pine.

The community of crook-stem birch forest is typical for the subalpine belt. However, it is almost entirely destroyed on a country level. The dominant species of the tree layer birch *Betula litwinowii* and that of the shrub layer *Rhododendron caucasicum* are endemic species of the Caucasus. The two areas of crook-stem birch forest (Sites 2 and 5) are located within the proposed RoW while one (Site 14) is approximately 145 m south of the current route.

Figure II-6 Crook-stem birch forest, Kodiana

The other three sites (10, 12 and 13) comprise a forest where two ecologically different species beech *Fagus orientalis* and pine *Pinus sylvestris* prevail in the tree layer. In addition, there is a small population of an endemic species of the Caucasus – *Scilla rosenii* on Site 12. *Scilla rosenii* (family Liliaceae) is a decorative bulbous plant (geophyte) reaching 7 to 10 cm in height. It grows in the sub-alpine meadows and upper mountainous belt. The flowering period is May.

Figure II-7 ***Scilla rosenii***

A total length of sites of high conservation value to be crossed by the proposed route is approximately 4,830 m.

A thinned primary pine forest with high-mountainous maple (Site 7) was classed as being of medium to high value. It supports a small population of snowdrop *Galanthus caucasicus* – rare species of Georgia and endemic of the Caucasus, which is proposed for inclusion into a new edition of the Georgian Red Data Book. *Galanthus caucasicus* (family Amaryllidaceae) is a decorative bulbous plant (geophyte) with narrow elongated greyish leaves. It reaches 10 – 15 cm in height. The flowering period is March-April. It occurs in forests, shrubbery and forest margins. Three sites (NN 8, 9 and 11) comprising well-developed primary pine forests, though disturbed to various degrees, were also classified as being of medium to high conservation value. A total length of sites of medium to high conservation value to be crossed by the proposed route is approximately 2,800 m.

Sites 15 and 16 comprise alpine meadows supporting populations of the following Caucasian endemic species: (a) Site 15 – *Scilla rosenii*, and (b) Site 16 - *Scilla rosenii* and *Gentiana angulosa.*

Gentiana angulosa is a decorative plant reaching only 5 cm in height. It grows in alpine meadows of the Great and Minor Caucasus. The flowering period is May.

Figure II-8 Alpine meadow, Kodiana

Alpine meadows located within / adjacent to the proposed pipeline route are overgrazed and used intensively as hay meadows. As a result, they do not have high conservation value in floristic terms. However, RoW clearance and construction activities may trigger off erosion processes, in particular in areas with steep inclination, if herbaceous cover is inadequately reinstated.

Figure II-9 Tskhratskaro rock exposures with thyme

Table II-6 below provides a list of the vegetation types studied and their conservation values. Full information on representative sample plots is given in Annex II Detailed Floristic and Phytosociological Description of Sample plots. Their location relative to the proposed route is shown on Figure II-20.

Table II-6 Plant community types surveyed and conservation value

Site No.	Community Type	Conservation Value
1	Overgrazed Alpine Meadow	Low
2	Crook-Stem Birch Forest	High
3	Variegated Fescue Meadow	Low
4	*Rhododendron caucasicum* scrub	Low
5	Crook-Stem Birch Forest	High
6	Hay Meadow	Low
7	Thinned Pine Forest with High-Mountain Maple	Medium to High
8	Thinned Pine Forest	Medium to High
9	Pine Forest	Medium to High
10	Beech Forest with Pine	High
11	Thinned Pine Forest	Medium to High
12	Beech Forest with Pine	High
13	Beech Forest with Pine	High
14	Crook-Stem Birch Forest	High
15	Alpine Meadow	Low
16	Alpine Meadow	Low

7 DETAILED BOTANICAL SURVEYS FROM VILLAGE SAKIRE TO RIVER POTSKHOVI EAST CROSSING

7.1 INTRODUCTION

A detailed survey of the area was conducted in May 2001 by Georgian ecologists Dr. Mamia Loria (Tbilisi Central Botanical Garden) and David Kikodze (Institute of Botany of Georgian Academy of Sciences).

The study area comprises the proposed route section from village Sakire surroundings to the south bank of river Potskhovi (Potskhovi east crossing). The section crosses agricultural fields, scattered shrubbery, forest margins, various types of forests and mountain meadows. The altitudes range from 980 to 1,950 m AMSL. A total length of the section from the start point in the surroundings of village Sakire to the west bank of Potskhovi river is approximately 44 km.

As the sensitive sites are located along various sections of the route, the study area was subdivided into two sub-areas:

- Area from village Sakire surroundings to village Tkemlana, and
- Areas in the vicinity of Mtkvari and Potskhovi crossings.

7.2 SURVEY RESULTS

7.2.1 Sub-area 1

Eleven sites were studied within this sub-area representing various types of both coniferous and broad-leaved forests and shrubbery dominated by the sea buckthorn. Four sites were classified as being of high conservation value as they represent primary coniferous forests with high regeneration rate and high coverage of tree layer.

Figure II-10 Spruce forest, Sakire

Although the other sites are disturbed and there is a clear evidences of destructive human activities (logging, cutting for timber) resulting in thinned treelayer and increased number of meadow and weedy elements of flora in the herbaceous layer, they still were given medium to high conservation value status due to high restoration potential reflected by fairly dense growth of saplings in the understorey and presence of Red Data Book species (high-mountain oak *Quercus macranthera* - Sites 9,10, sea buckthorn *Hipopphaë rhamnoides* - Site 11).

Community types surveyed in Sub-area 1 and corresponding conservation values are given in Table II-11 below. Full information on representative sample plots is given in Annex II Detailed Floristic and Phytosociological Description of Sample plots. Their location relative to the proposed route is shown on Figures II-21-22.

Figure II-11 Sea buckthorn

Table II-7 Community types surveyed in sub-area 1 and conservation value

Site No.	Community Type	Conservation Value
1	Thinned Spruce-Pine Forest	Medium to High
2	Spruce Forest	High
3	Spruce Forest	High
4	Thinned Spruce Forest	Medium to High
5	Thinned Spruce Forest	Medium to High
6	Spruce Forest	High
7	Thinned Spruce-Fir Forest	Medium to High
8	Spruce-Fir Forest	High
9	Fragment of High-Mountainous Oak Forest	Medium to High
10	Fragment of High-Mountainous Oak Forest	Medium to High
11	Sea buckthorn dominated shrubwood	Medium to High

7.2.2 Sub-area 2

Four sites were studied within this sub-area comprising riparian forests developed on the banks of rivers Mtkvari and Potskhovi and a dry hill 400 south of the proposed Potskhovi east crossing where *Nitraria schoberi* (GRDB) was likely to grow according to preliminary information.

Riparian forest developed on the west bank of the river Mtkvari (Site 12) in the vicinity of the proposed crossing is a remnant of a primary forest intensively disturbed as a result of human

activities. Cutting of poplars to clear the land for agricultural activities resulted in low coverage of the tree layer, and a high ratio of weedy herbaceous species in the herb layer that suppresses natural regeneration.

Riparian forests on both banks of the river Potskhovi, in the vicinity of the proposed east crossing, are of primary origin (Sites 13,14), though degraded due to human interference. Considerable part of the natural forest has been cleared for agricultural purposes on the south bank of river Potskhovi (Site 14). Despite the obvious signs of man's destructive activities, the riparian forest fragments are of medium to high conservation value as this type of habitat has become extinct throughout the country and it is important to conserve even small and degraded fragments as a basis for further restoration.

Figure II-12 Riparian forest fragment, Postkhovi east crossing

Although the route section that crosses a dry hill 400 m south of the river Potskhovi was surveyed thoroughly, no individuals / populations of *Nitraria schoberi* were found to occur in the area. However, another Red Data Book species – *Globularia trichosantha* (family Globulariaceae) was found to grow on a limited area of 1,500m^2, approximately 150 m west of the pipeline RoW (Site 15). This plant was not known before to occur in Southern Georgia (Flora of Georgia, 1999). *Globularia trichosantha* is a herbaceous plant reaching 30cm in height. It forms small populations in dry areas at forest margins, screes and open meadows. Although the habitat itself is common throughout Georgia, it was classified as having high conservation value due to the presence of a rare Red Data Book species.

Figure II-13 Globedaisy *Globularia trichosantha*

Community types surveyed in Sub-area 2 and corresponding conservation values are given in Table II-12 below. Full information on representative sample plots is given in Annex II Detailed Floristic and Phytosociological Description of Sample plots. Their location relative to the proposed route is shown on Figures II-21-22.

Table II-8 Community types surveyed in sub-area 2 and conservation value

Site No.	Community Type	Conservation Value
12	Thinned Riparian Forest of Black Poplar	Medium to High
13	Riparian Forest of Black Poplar	Medium to High
14	Riparian Forest of Willow	Medium to High
15	Shibljiak / Open Meadow	High

8 BOTANICAL SURVEYS AT POTSKHOVI WEST CROSSING

8.1 INTRODUCTION

A detailed survey of the area was conducted in September 2001 by Georgian ecologists Dr. Mamia Loria (Tbilisi Central Botanical Garden) and David Kikodze (Institute of Botany of Georgian Academy of Sciences).

The study area comprises a 100 m zone on either side of the proposed Potskhovi west crossing where preliminary surveys indicated presence of rare plant of the Georgian flora – Oriental thorn (*Crataegus orientalis*).

8.2 SURVEY RESULTS

During the detailed floristic survey only a sole individual of Oriental thorn (*Crataegus orientalis*) was found within the study area.

Oriental thorn is an ornamental plant up to 4m in height with broadly wedge-shaped leaves. Leaves are green, frosted with whitish hairs and deeply divided into narrow lobes. The large white flowers appear in summer in small clusters, followed in fall by 25mm yellowish fruit. The recorded individual of Oriental thorn is associated with a secondary shrubland developed at the edge of cultivated land. Phytosociological survey of the habitat showed that it is of medium conservation value supporting a Red Data Book species - Sea buckthorn (*Hippophaë rhamnoides*). This species is widespread throughout the region and country. In general, the habitat is dominated by common species that are found almost everywhere in Georgia under more or less similar environmental conditions.

Figure II-14 Oriental thorn

Full information on the representative sample plot is given in Annex II Detailed Floristic and Phytosociological Description of Sample plots. The location relative to the proposed route is shown on Figure II-23.

APPENDIX II ANNEX II DETAILED FLORISTIC AND PHYTOSOCIOLOGICAL DESCRIPTION OF SAMPLE PLOTS

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1 TETRI TSKARO AREA

Forest type	Degraded Georgian Oak Forest with Abundant Growth of Shrubs
Plot No.	1
Plot size (m^2)	400
GPS Co-ordinates	4599001N / 8462273E
Altitude (m AMSL)	790
Aspect	North-West
Inclination	$13\text{-}15^0$
Structural Features	
Max DBH (cm)	15
Average DBH (cm)	10
Max height of trees (m)	8
Average height (m)	6
Number of trees (per plot)	13
Coverage of treelayer (%)	50
Coverage of shrublayer (%)	50
Coverage of herblayer (%)	70
Coverage of mosslayer (%)	0
Number of higher plant species	15
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus iberica	9
Fraxinus excelsior	5
Salix alba	1
Shrublayer	
Carpinus orientalis	7
Corylus avellana	6
Swida australis	5
Ligustrum vulgare	4
Herblayer	
Poa nemoralis	6
Carex hallerana	5
Viola kitaibeliana	4
Primula macrocalyx	4
Cyclamen verum	4
Geranium robertianum	4
Serratula quinquefolium	1
Cruciata laevipes	1

Figure II-24 Degraded Georgian oak forest with abundant growth of shrubs

Forest type	Degraded / Secondary Georgian Oak Forest
Plot No.	2
Plot size (m^2)	400
GPS Co-ordinates	4598985N / 8457891E
Altitude (m AMSL)	1,000
Aspect	South-East
Inclination	8^0
Structural Features	
Max DBH (cm)	20
Average DBH (cm)	15
Max height of trees (m)	12
Average height (m)	9
Number of trees (per plot)	30
Coverage of treelayer (%)	80
Coverage of shrublayer (%)	20
Coverage of herblayer (%)	50
Coverage of mosslayer (%)	0
Number of higher plant species	11
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus iberica	8
Carpinus orientalis	6
Fraxinus excelsior	4
Pyrus caucasica	1
Shrublayer	
Swida australis	8
Crataegus curvisepala	5
Ligustrum vulgare	4
Herblayer	
Polygonatum multiflorum	8
Primula macrocalyx	6
Convallaria transcaucasica	4
Cyclamen verum	4

Figure II-25 Degraded / secondary Georgian oak forest

Forest type	**Secondary Georgian Oak Forest with Oriental Hornbeam**
Plot No.	3
Plot size (m^2)	400
GPS Co-ordinates	4598958N / 8456835E
Altitude (m AMSL)	1,050
Aspect	North-East
Inclination	4°
Structural Features	
Max DBH (cm)	12
Average DBH (cm)	9
Max height of trees (m)	8
Average height (m)	6
Number of trees (per plot)	30
Coverage of treelayer (%)	65
Coverage of shrublayer (%)	30
Coverage of herblayer (%)	50
Coverage of mosslayer (%)	50
Number of higher plant species	13
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus iberica	8
Carpinus orientalis	7
Shrublayer	
Crataegus curvisepala	7
Lonicera caprifolium	6
Swida australis	6
Mespilus germanica	1
Herblayer	
Stellaria media	6
Polygonatum multiflorum	6
Primula macrocalyx	4
Lamium amplexicaule	4
Vinca herbacea	4
Galium odoratum	3
Cyclamen verum	3

Figure II-26 Secondary Georgian oak forest with Oriental hornbeam

Forest type	Secondary Georgian Oak Forest with admixture of High-Mountainous Oak
Plot No.	4
Plot size (m^2)	400
GPS Co-ordinates	4600007N / 8454162E
Altitude (m AMSL)	1,100
Aspect	South-East
Inclination	2°
Structural Features	
Max DBH (cm)	25
Average DBH (cm)	17
Max height of trees (m)	12
Average height (m)	8
Number of trees (per plot)	27
Coverage of treelayer (%)	60
Coverage of shrublayer (%)	25
Coverage of herblayer (%)	95
Coverage of mosslayer (%)	5
Number of higher plant species	16
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus iberica	9
Quercus macranthera	5
Shrublayer	
Lonicera caucasica	6
Corylus avellana	6
Rosa canina	5
Lonicera caprifoloium	5
Crataegus curvisepala	1
Herblayer	
Carex hallerana	6
Poa pratensis	5
Polygonatum multiflorum	4
Primula macrocalyx	4
Lamium amplexicaule	4
Viola odorata	4
Galium odoratum	3
Ficaria calthifolia	3
Salvia verticillata	2

Figure II-27 Secondary Georgian oak forest with admixture of high-mountainous oak

Forest type	**Secondary Georgian Oak Forest with admixture of High-Mountainous Oak**
Plot No.	5
Plot size (m^2)	400
GPS Co-ordinates	4600637N / 8452666E
Altitude (m AMSL)	1,130
Aspect	East
Inclination	7°
Structural Features	
Max DBH (cm)	55
Average DBH (cm)	25
Max height of trees (m)	15
Average height (m)	12
Number of trees (per plot)	6
Coverage of treelayer (%)	30
Coverage of shrublayer (%)	50
Coverage of herblayer (%)	70
Coverage of mosslayer (%)	5
Number of higher plant species	12
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus iberica	8
Quercus macranthera	5
Pyrus caucasica	3
Shrublayer	
Crataegus heterophylla	7
Lonicera caucasica	6
Cornus mas	6
Herblayer	
Poa nemoralis	7
Carex sp.	6
Dactylis glomerata	5
Primula macrocalyx	5
Orobus hirsutus	4
Centaurea salicifolia	3

Figure II-28 Secondary Georgian oak forest with admixture of high-mountainous oak

Forest type	Primary Georgian Oak Forest with Admixture of High-Mountainous Oak
Plot No.	6
Plot size (m^2)	400
GPS Co-ordinates	4600780N / 8452018E
Altitude (m AMSL)	1,140
Aspect	South
Inclination	10°
Structural Features	
Max DBH (cm)	40
Average DBH (cm)	28
Max height of trees (m)	14
Average height (m)	10
Number of trees (per plot)	12
Coverage of treelayer (%)	60
Coverage of shrublayer (%)	30
Coverage of herblayer (%)	40
Coverage of mosslayer (%)	0
Number of higher plant species	17
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus iberica	7
Quercus macranthera	6
Acer campestre	4
Carpinus caucasica	4
Carpinus orientalis	4
Shrublayer	
Cornus mas	7
Crataegus heterophylla	6
Lonicera caucasica	4
Euonymus verrucosa	4
Herblayer	
Carex halleriana	6
Fragaria viridis	6
Poa nemoralis	6
Primula macrocalyx	5
Serratula quinquefolia	4
Campanula rapunculoides	4
Calamintha grandiflora	4
Bromus benekenii	4

Figure II-29 Primary Georgian oak forest with admixture of high-mountainous oak

Forest type	Fragment of Riparian Forest
Plot No.	7
Plot size (m^2)	400
GPS Co-ordinates	4600833N / 8451997E
Altitude (m AMSL)	1,135
Aspect	North-West
Inclination	10°
Structural Features	
Max DBH (cm)	70
Average DBH (cm)	22
Max height of trees (m)	10
Average height (m)	6
Number of trees (per plot)	9
Coverage of treelayer (%)	40
Coverage of shrublayer (%)	40
Coverage of herblayer (%)	60
Coverage of mosslayer (%)	50
Number of higher plant species	14
Species	**Cover-abundance by Domin scale**
Treelayer	
Salix alba	5
Salix pseudomedemii	5
Quercus iberica	5
Quercus macranthera	4
Carpinus caucasica	4
Pyrus caucasica	4
Shrublayer	
Corylus avellana	7
Rubus caesius	7
Lonicera caucasica	5
Herblayer	
PetaSites georgicus	7
Equisetum arvense	6
Mentha longifolia	5
Inula sp.	4
Epilobium sp.	4

Figure II-30 Fragment of riparian forest

Forest type	Secondary Caucasian Hornbeam Forest with Admixture of Oaks
Plot No.	8
Plot size (m^2)	400
GPS Co-ordinates	4600823N / 8451838E
Altitude (m AMSL)	1,150
Aspect	West
Inclination	3°
Structural Features	
Max DBH (cm)	33
Average DBH (cm)	22
Max height of trees (m)	14
Average height (m)	10
Number of trees (per plot)	10
Coverage of treelayer (%)	60
Coverage of shrublayer (%)	10
Coverage of herblayer (%)	30
Coverage of mosslayer (%)	10
Number of higher plant species	15
Species	**Cover-abundance by Domin scale**
Treelayer	
Carpinus orientalis	6
Quercus iberica	5
Quercus macranthera	5
Pyrus caucasica	4
Carpinus caucasica	4
Fagus orientalis	4
Fraxinus excelsior	4
Shrublayer	
Crataegus curvisepala	8
Rubus candicans	5
Cornus mas	4
Herblayer	
Poa nemoralis	7
Carex sp.	6
Primula macrocalyx	5
Stellaria media	5
Campanula rapunculoides	4

Figure II-31 Secondary Caucasian hornbeam forest with admixture of oaks

Forest type	Beechwood
Plot No.	9
Plot size (m^2)	400
GPS Co-ordinates	4601196N / 8451330E
Altitude (m AMSL)	1,180
Aspect	South
Inclination	5°
Structural Features	
Max DBH (cm)	35
Average DBH (cm)	22
Max height of trees (m)	15
Average height (m)	12
Number of trees (per plot)	10
Coverage of treelayer (%)	65
Coverage of shrublayer (%)	0
Coverage of herblayer (%)	5
Coverage of mosslayer (%)	5
Number of higher plant species	10
Species	**Cover-abundance by Domin scale**
Treelayer	
Fagus orientalis	7
Carpinus caucasica	5
Quercus macranthera	4
Quercus iberica	4
Cerasus avium	4
Pyrus caucasica	4
Shrublayer	
No shrub species have been recorded	
Herblayer	
Carex sp.	8
Primula macrocalyx	5
Orobus hirsutus	4
Serratula quinquefolia	4

Figure II-32 Beechwood

Forest type	Secondary Caucasian Hornbeam Forest with Admixture of High-Mountainous Oak
Plot No.	10
Plot size (m^2)	400
GPS Co-ordinates	4601605N / 8450951E
Altitude (m AMSL)	1,225
Aspect	South-East
Inclination	6°
Structural Features	
Max DBH (cm)	33
Average DBH (cm)	15
Max height of trees (m)	14
Average height (m)	12
Number of trees (per plot)	13
Coverage of treelayer (%)	75
Coverage of shrublayer (%)	10
Coverage of herblayer (%)	25
Coverage of mosslayer (%)	5
Number of higher plant species	14
Species	**Cover-abundance by Domin scale**
Treelayer	
Carpinus caucasica	8
Quercus macranthera	5
Pyrus caucasica	4
Fraxinus exceslior	4
Shrublayer	
Crataegus curvisepala	8
Ligustrum vulgare	5
Lonicera caucasica	4
Herblayer	
Carex hallerana	6
Poa nemoralis	6
Galium odoratum	5
Orobus hirsutus	4
Bromus benekenii	4
Viola sp.	3
Primula macrocalyx	3

Figure II-33 Secondary Caucasian hornbeam forest with admixture of high-mountainous oak

Forest type	Primary High-Mountainous Oak-Caucasian Hornbeam Forest
Plot No.	11
Plot size (m^2)	400
GPS Co-ordinates	4602389N / 8450330E
Altitude (m AMSL)	1,295
Aspect	South-East
Inclination	6°
Structural Features	
Max DBH (cm)	55
Average DBH (cm)	28
Max height of trees (m)	15
Average height (m)	10
Number of trees (per plot)	10
Coverage of treelayer (%)	65
Coverage of shrublayer (%)	10
Coverage of herblayer (%)	40
Coverage of mosslayer (%)	5
Number of higher plant species	10
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus macranthera	7
Carpinus caucasica	7
Shrublayer	
Rosa canina	7
Lonicera caucasica	6
Rubus candicans	5
Herblayer	
Carex hallerana	7
Poa nemoralis	7
Galium odoratum	6
Astrantia maxima	3
Primula macrocalyx	2

Figure II-34 Primary high-mountainous oak-Caucasian hornbeam forest

Community type	Secondary Caucasian Hornbeam-High Mountainous Oak Forest
Plot No.	12
Plot size (m^2)	400
GPS Co-ordinates	4602508N / 8450259E
Altitude (m AMSL)	1,310
Aspect	South-East
Inclination	5°
Structural Features	
Max DBH (cm)	63
Average DBH (cm)	30
Max height of trees (m)	12
Average height (m)	8
Number of trees (per plot)	12
Coverage of treelayer (%)	70
Coverage of shrublayer (%)	10
Coverage of herblayer (%)	60
Coverage of mosslayer (%)	5
Number of higher plant species	16
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus macranthera	6
Carpinus caucasica	6
Fraxinus excelsior	5
Pyrus caucasica	4
Shrublayer	
Crataegus pentagyna	6
Rosa canina	6
Berberis vulgaris	5
Prunus divaricata	4
Herblayer	
Poa nemoralis	6
Festuca pratense	6
Dactylis glomerata	5
Alchemilla sp.	5
Bromus benekenii	4
Phleum pratense	4
Primula macrocalyx	3
Geum urbanum	2

Figure II-35 Secondary Caucasian hornbeam-high mountainous oak forest

Forest type	Secondary High-Mountainous Oak Forest
Plot No.	13
Plot size (m^2)	400
GPS Co-ordinates	4603413N / 8449302E
Altitude (m AMSL)	1,385
Aspect	South-East
Inclination	5°
Structural Features	
Max DBH (cm)	42
Average DBH (cm)	25
Max height of trees (m)	10
Average height (m)	7
Number of trees (per plot)	11
Coverage of treelayer (%)	50
Coverage of shrublayer (%)	10
Coverage of herblayer (%)	80
Coverage of mosslayer (%)	5
Number of higher plant species	13
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus macranthera	7
Carpinus caucasica	5
Acer campestre	4
Fraxinus excelsior	4
Pyrus caucasica	4
Shrublayer	
Rosa canina	7
Euonymus verrucosa	5
Prunus spinosa	5
Herblayer	
Poa nemoralis	6
Carex halleriana	6
Phleum pratense	5
Dactylis glomerata	5
Lapsana communis	3

Figure II-36 Secondary high-mountainous oak forest

Forest type	Secondary Thinned High-Mountainous Oak Forest
Plot No.	14
Plot size (m^2)	400
GPS Co-ordinates	4603697N / 8448458E
Altitude (m AMSL)	1,425
Aspect	East
Inclination	5°
Structural Features	
Max DBH (cm)	45
Average DBH (cm)	25
Max height of trees (m)	12
Average height (m)	8
Number of trees (per plot)	8
Coverage of treelayer (%)	30
Coverage of shrublayer (%)	15
Coverage of herblayer (%)	80
Coverage of mosslayer (%)	5
Number of higher plant species	18
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus macranthera	8
Carpinus caucasica	4
Pyrus caucasica	4
Fraxinus excelsior	4
Shrublayer	
Crataegus kyrtostylla	7
Crataegus monogyna	6
Rosa canina	5
Herblayer	
Poa pratense	6
Festuca sulcata	5
Trifolium campestre	5
Festuca pratense	5
Agrostis planifolia	4
Calamagrostis arundinacea	4
Dactylis glomerata	3
Centaurea salicifolia	3
Geranium sp.	3
Galium verum	3
Briza sp.	1

Figure II-37 Secondary thinned high-mountainous oak forest

Community type	Meadow Fescue Dominated Grazed Meadow
Plot No.	15
Plot size (m^2)	100
GPS Co-ordinates	4603927N / 8448319E
Altitude (m AMSL)	1,425
Aspect	South-East
Inclination	3°
Structural Features	
Coverage of herblayer (%)	95
Coverage of mosslayer (%)	5
Number of higher plant species	14
Species	**Cover-abundance by Domin scale**
Festuca pratensis	7
Poa pratensis	6
Trifolium pratense	5
Plantago lanceolata	5
Bromopsis benekenii	5
Primula macrocalyx	4
Geranium gymnocaulon	4
Achillea setacea	3
Muscari szovitsianum	3
Potentilla anserina	3
Cirsium obvallatum	2

Figure II-38 Meadow fescue dominated grazed meadow

Forest type	Secondary High-Mountainous Oak Forest
Plot No.	16
Plot size (m^2)	400
GPS Co-ordinates	4604390N / 8448259E
Altitude (m AMSL)	1,450
Aspect	South
Inclination	5°
Structural Features	
Max DBH (cm)	80
Average DBH (cm)	35
Max height of trees (m)	10
Average height (m)	8
Number of trees (per plot)	10
Coverage of treelayer (%)	65
Coverage of shrublayer (%)	20
Coverage of herblayer (%)	70
Coverage of mosslayer (%)	20
Number of higher plant species	11
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus macranthera	8
Carpinus caucasica	5
Fagus orientalis	+
Shrublayer	
Crataegus kyrtostylla	7
Rosa canina	5
Herblayer	
Poa nemoralis	8
Calamintha nepeta	5
Primula macrocalyx	4
Lapsana communis	4
Astrantia maxima	3

Figure II-39 Secondary high-mountainous oak forest

Forest type	Primary High Mountainous Oak-Caucasian Hornbeam Forest
Plot No.	17
Plot size (m^2)	400
GPS Co-ordinates	4604710N / 8448209E
Altitude (m AMSL)	1,480
Aspect	South-East
Inclination	10°
Structural Features	
Max DBH (cm)	52
Average DBH (cm)	35
Max height of trees (m)	15
Average height (m)	11
Number of trees (per plot)	10
Coverage of treelayer (%)	65
Coverage of shrublayer (%)	30
Coverage of herblayer (%)	70
Coverage of mosslayer (%)	20
Number of higher plant species	17
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus macranthera	7
Carpinus caucasica	7
Acer campestre	4
Fagus orientalis	4
Shrublayer	
Crataegus kyrtostylla	8
Pyrus caucasica (saplings)	5
Carpinus caucasica (saplings)	4
Herblayer	
Poa nemoralis	6
Dryopteris filix mas	5
Urtica dioica	5
Stellaria media	4
Calamintha nepeta	4
Lapsana communis	3
Lapsana communis	3
Primula macrocalyx	3
Delphinium sp.	2
Astrantia maxima	2

Figure II-40 Primary high mountainous oak-Caucasian hornbeam forest

Forest type	Beechwood
Plot No.	18
Plot size (m^2)	400
GPS Co-ordinates	4604755N / 8448188E
Altitude (m AMSL)	1,470
Aspect	North-West
Inclination	12°
Structural Features	
Max DBH (cm)	50
Average DBH (cm)	38
Max height of trees (m)	20
Average height (m)	14
Number of trees (per plot)	9
Coverage of treelayer (%)	70
Coverage of shrublayer (%)	10
Coverage of herblayer (%)	10
Coverage of mosslayer (%)	10
Number of higher plant species	5
Species	**Cover-abundance by Domin scale**
Treelayer	
Fagus orientalis	9
Carpinus caucasica	4
Shrublayer	
Fagus orientalis (saplings)	10
Herblayer	
Dryopteris filix mas	8
Galium odoratum	5
Polygonatum multiflorum	4

Figure II-41 Beechwood

Forest type	Thinned High-Mountainous Oak Forest
Plot No.	19
Plot size (m^2)	400
GPS Co-ordinates	4605030N / 8448152E
Altitude (m AMSL)	1,440
Aspect	North-West
Inclination	10°
Structural Features	
Max DBH (cm)	45
Average DBH (cm)	28
Max height of trees (m)	12
Average height (m)	7
Number of trees (per plot)	6
Coverage of treelayer (%)	25
Coverage of shrublayer (%)	10
Coverage of herblayer (%)	85
Coverage of mosslayer (%)	0
Number of higher plant species	14
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus macranthera	8
Pyrus caucasica	4
Malus orientalis	4
Cerasus avium	4
Shrublayer	
Rosa canina	7
Salix caprea	5
Euonymus europaeus	5
Rubus idaeus	4
Herblayer	
Dactylis glomerata	7
Brachypodium sylvaticum	6
Galega officinalis	5
Geranium pyrenaicum	4
Linaria sp.	3
Campanula sp.	3

Figure II-42 Thinned high-mountainous oak forest

Forest type	Thinned High-Mountainous Oak Forest
Plot No.	20
Plot size (m^2)	400
GPS Co-ordinates	4605384N / 8448068E
Altitude (m AMSL)	1,445
Aspect	South-East
Inclination	3°
Structural Features	
Max DBH (cm)	63
Average DBH (cm)	20
Max height of trees (m)	14
Average height (m)	10
Number of trees (per plot)	8
Coverage of treelayer (%)	30
Coverage of shrublayer (%)	10
Coverage of herblayer (%)	85
Coverage of mosslayer (%)	5
Number of higher plant species	16
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus macranthera	7
Malus orientalis	5
Pyrus caucasica	4
Cerasus avium	4
Shrublayer	
Rosa canina	7
Euonymus europaea	6
Crataegus kyrtostylla	5
Salix caprea	5
Lonicera caucasica	3
Herblayer	
Poa nemoralis	7
Dactylis glomerata	5
Primula macrocalyx	5
Briza media	4
Phleum pratense	4
Leucanthemum vulgare	2
Taraxacum officinale	2

Figure II-43 Thinned high-mountainous oak forest

Forest type	Fragment of Beech Forest with Caucasian Hornbeam
Plot No.	21
Plot size (m^2)	400
GPS Co-ordinates	4606404N / 8448036E
Altitude (m AMSL)	1,570
Aspect	South-East
Inclination	12°
Structural Features	
Max DBH (cm)	52
Average DBH (cm)	39
Max height of trees (m)	25
Average height (m)	20
Number of trees (per plot)	9
Coverage of treelayer (%)	80
Coverage of shrublayer (%)	5
Coverage of herblayer (%)	10
Coverage of mosslayer (%)	30
Number of higher plant species	7
Species	**Cover-abundance by Domin scale**
Treelayer	
Fagus orientalis	9
Carpinus caucasica	5
Acer campestre	1
Shrublayer	
Lonicera caucasica	10
Herblayer	
Poa nemoralis	8
Polygonatum multiflorum	4
Primula macrocalyx	4

Figure II-44 Fragment of beech forest with Caucasian hornbeam

Forest type	Park-Like High-Mountainous Oak Forest
Plot No.	22
Plot size (m^2)	400
GPS Co-ordinates	4606742N / 8448082E
Altitude (m AMSL)	1,580
Aspect	South-East
Inclination	5°
Structural Features	
Max DBH (cm)	55
Average DBH (cm)	45
Max height of trees (m)	15
Average height (m)	11
Number of trees (per plot)	8
Coverage of treelayer (%)	70
Coverage of shrublayer (%)	30
Coverage of herblayer (%)	90
Coverage of mosslayer (%)	10
Number of higher plant species	15
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus macranthera	10
Carpinus caucasica	1
Cerasus avium	1
Shrublayer	
Ribes alpinum	7
Rubus idaeus	6
Salix caprea	4
Rubus candicans	4
Lonicera caucasica	4
Herblayer	
Poa nemoralis	7
Trifolium repens	5
Viola somchetica	4
Geranium robertianum	4
Primula macrocalyx	4
Polygonatum multiflorum	3
Corydalis angustifolia	3

Figure II-45 Park-like high-mountainous oak forest

Forest type	Park-Like High-Mountainous Oak Forest
Plot No.	23
Plot size (m^2)	400
GPS Co-ordinates	4607249N / 8448092E
Altitude (m AMSL)	1,600
Aspect	South
Inclination	5°
Structural Features	
Max DBH (cm)	35
Average DBH (cm)	28
Max height of trees (m)	15
Average height (m)	12
Number of trees (per plot)	7
Coverage of treelayer (%)	80
Coverage of shrublayer (%)	10
Coverage of herblayer (%)	90
Coverage of mosslayer (%)	10
Number of higher plant species	14
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus macranthera	10
Pyrus caucasica	1
Shrublayer	
Rosa canina	9
Prunus divaricata	5
Herblayer	
Poa nemoralis	6
Primula macrocalyx	5
Polygonatum multiflorum	4
Viola somchetica	4
Achillea micrantha	4
Trifolium pratense	4
Sedum stoloniferum	3
Campanula rapunculoides	3
Aconitum sp.	3
Origanum vulgare	3

Figure II-46 Park-like high-mountainous oak forest

2 WETLANDS IN THE VICINITY OF MOUNTAIN TAVKVETILI AND RIVER KTSIA UPPER REACHES

Community type	**Sedge Dominated Wetland with Tufted Hair-grass and Mat-grass**
Plot No.	1
Plot size (m^2)	900
GPS Co-ordinates	4616663N / 8398283E
Altitude (m AMSL)	1970
Aspect	North
Inclination	$1\text{-}3^0$
Structural Features	
Coverage of herblayer (%)	80
Coverage of mosslayer (%)	10
Number of higher plant species	15
Number of moss species	3
Species	**Cover-abundance by Domin scale**
Herblayer	
Deschampsia caespitosa	7
Nardus glabriculmis	6
Carex wiluica	5
Carex leporina	5
Carex inflata	5
Carex cansecens	5
Carex vesicaria	5
Heleocharis palustris	4
Ranunculus oreophilus	3
Epilobium palustre	3
Agrostis alba	3
Alopecurus aequalis	3
Calamagrostis pseudophragmites	3
Climacium dendroides	2
Sparganium simplex	2
Mosslayer	
Calliergonella cuspidata	7
Sphagnum platyphyllum	6
Drepanocladus aduncus var. *polyconpus*	6

Figure II-47 Sedge dominated wetland with tufted hair-grass and mat-grass

Community type	**Sedge Dominated Wetland with Mat-grass**
Plot No.	2
Plot size (m^2)	100
GPS Co-ordinates	4616942N / 8394648E
Altitude (m AMSL)	2250
Aspect	East
Inclination	1^0
Structural Features	
Coverage of herblayer (%)	80
Coverage of mosslayer (%)	15
Number of higher plant species	11
Number of moss species	6
Species	**Cover-abundance by Domin scale**
Herblayer	
Carex inflata	7
Carex acutiformis	7
Nardus glabriculmis	6
Carex canescens	5
Carex acrifolius	4
Carex vulpina	4
Veronica scutellata	4
Carum carvi	2
Juncus atratus	2
Cardamine uliginosa	2
Epilobium palustre	2
Galium palustre	2
Mosslayer	
Brachytecium plumosum	7
Sphagnum platyphyllum	4
Hypnum lindbergi	4
Drepanocladus exannulatus	4
Drepanocladus aduncus	3
Philonotis fontana	2

Figure II-48 Sedge dominated wetland with mat-grass

Community type	Sedge Dominated Wetland with Mat-grass
Plot No.	3
Plot size (m^2)	100
GPS Co-ordinates	4616941N / 8394507E
Altitude (m AMSL)	2255
Aspect	East
Inclination	2^0
Structural Features	
Coverage of herblayer (%)	80
Coverage of mosslayer (%)	90
Number of higher plant species	9
Number of moss species	3
Species	**Cover-abundance by Domin scale**
Herblayer	
Carex inflata	7
Carex acutiformis	7
Nardus glabriculmis	6
Carex acrifolius	4
Carex vulpina	4
Veronica scutellata	4
Cardamine uliginosa	4
Calamagrostis pseudocyperus	3
Galium palustre	+
Mosslayer	
Pogonatum urnigerum	6
Drepanocladus exannulatus	6
Sphagnum platyphyllum	5

Figure II-49 Sedge dominated wetland with mat-grass

Community type	Tufted Sedge Dominated Wetland
Plot No.	4
Plot size (m^2)	100
GPS Co-ordinates	4619035 N / 8391551 E
Altitude (m AMSL)	2050
Aspect	East
Inclination	1^0
Structural Features	
Coverage of herblayer (%)	95
Coverage of mosslayer (%)	60
Number of higher plant species	12
Number of moss species	3
Species	**Cover-abundance by Domin scale**
Herblayer	
Carex elata	7
Carex vesicaria	5
Comarum palustre	4
Poa palustris	4
Calamagrostis neglecta	4
Galium palustre	4
Deschampsia caespitosa	4
Carex lasiocarpa	4
Agrostis alba	4
Pyrethrum punctatum	2
Ligularia sibirica	2
Caltha polypetala	2
Mosslayer	
Sphagnum platyphyllum	7
Hypnum lindbergii	6
Drepanocladus aduncus	6

Figure II-50 Tufted sedge dominated wetland

Community type	Sedge Dominated Wetland
Plot No.	5
Plot size (m^2)	100
GPS Co-ordinates	4618776N / 8391338E
Altitude (m AMSL)	2050
Aspect	East
Inclination	1^0
Structural Features	
Coverage of herblayer (%)	80
Coverage of mosslayer (%)	20
Number of higher plant species	7
Number of moss species	2
Species	**Cover-abundance by Domin scale**
Herblayer	
Carex wiluica	8
Calamagrostis glauca	6
Geranium palustre	6
Ligularia sibirica	6
Deschampsia caespitosa	4
Sanguisorba officinalis	4
Aconitum nasutum	2
Festuca rubra	2
Mosslayer	
Sphagnum platyphyllum	8
Calliergoniella cuspidata	8

Figure II-51 Sedge dominated wetland

Community type	Sedge Dominated Wetland with Common Duckweed
Plot No.	6
Plot size (m^2)	100
GPS Co-ordinates	4618345N / 8391262E
Altitude (m AMSL)	2050
Aspect	East
Inclination	1^0
Structural Features	
Coverage of herblayer (%)	75
Coverage of mosslayer (%)	0
Number of higher plant species	13
Number of moss species	0
Species	**Cover-abundance by Domin scale**
Herblayer	
Carex inflata	7
Lemna minor	7
Utricularia vulgaris	6
Carex vesicaria	5
Potamogeton heterophyllus	5
Potamogeton lucens	5

Figure II-52 Sedge dominated wetland with common duckweed

Community type	Sedge-Common Reed-Shining Pondweed Dominated Wetland
Plot No.	7
Plot size (m^2)	900
GPS Co-ordinates	4614882N / 8387383E
Altitude (m AMSL)	2004
Aspect	South-West
Inclination	1^0
Structural Features	
Coverage of herblayer (%)	95
Coverage of mosslayer (%)	0
Number of higher plant species	7
Number of moss species	0
Species	**Cover-abundance by Domin scale**
Herblayer	
Potamogeton natans	7
Scolochloa festucacea	6
Phragmites australis	6
Carex vesicaria	5
Heleocharis eupalustris	5
Equisetum heleocharis	5
Polygonum amphibium	5

Figure II-53 Sedge-common reed-shining pondweed dominated wetland

Community type	Water Crowfoot Dominated Wetland
Plot No.	8
Plot size (m^2)	100
GPS Co-ordinates	4616981N / 8384397E
Altitude (m AMSL)	2100
Aspect	North
Inclination	2^0
Structural Features	
Coverage of herblayer (%)	70
Coverage of mosslayer (%)	0
Number of higher plant species	6
Number of moss species	0
Species	**Cover-abundance by Domin scale**
Herblayer	
Batrachium divaricatum	8
Equisetum heleocharis	6
Potamogeton lucens	6
Carex inflata	5
Heleocharis eupalustris	5
Polygonum amphibium	4

Figure II-54 Water crowfoot dominated wetland

Community type	**Sedge Dominated Wetland**
Plot No.	9
Plot size (m^2)	100
GPS Co-ordinates	4617645N / 8384762E
Altitude (m AMSL)	2100
Aspect	South-East
Inclination	3^0
Structural Features	
Coverage of herblayer (%)	95
Coverage of mosslayer (%)	40
Number of higher plant species	10
Number of moss species	3
Species	**Cover-abundance by Domin scale**
Herblayer	
Carex wiluica	6
Carex inflata	5
Deschampsia caespitosa	5
Carex canescens	4
Comarum palustre	4
Poa palustris	4
Ranunculus oreophilus	4
Ranunculus repens	4
Geum rivale	4
Epilobium palustre	3
Mosslayer	
Sphagnum platyphyllum	7
Aulacomnium palustre	5
Drapanocladus aduncus	5

Figure II-55 Sedge dominated wetland

Community type	Sedge Dominated Wetland
Plot No.	10
Plot size (m^2)	100
GPS Co-ordinates	4617468N / 8384260E
Altitude (m AMSL)	2050
Aspect	South-East
Inclination	$2\text{-}3^0$
Structural Features	
Coverage of herblayer (%)	90
Coverage of mosslayer (%)	70
Number of higher plant species	9
Number of moss species	2
Species	**Cover-abundance by Domin scale**
Herblayer	
Carex inflata	7
Carex heleonastes	6
Comarum palustre	4
Sweertia iberica	4
Carex diandra	4
Eriophorum latifolium	3
Carex wiluica	2
Deschampsia caespitosa	2
Parnassia palustris	1
Mosslayer	
Drepanocladus sendtneri	8
Calliergoniella cuspidata	5

Figure II-56 Sedge dominated wetland

Community type	Sedge Dominated Wetland
Plot No.	11
Plot size (m^2)	100
GPS Co-ordinates	4617124N / 8376955E
Altitude (m AMSL)	2380
Aspect	East
Inclination	5^0
Structural Features	
Coverage of herblayer (%)	90
Coverage of mosslayer (%)	0
Number of higher plant species	7
Number of moss species	0
Species	**Cover-abundance by Domin scale**
Herblayer	
Carex inflata	8
Deschampsia caespitosa	6
Nardus glabriculmis	6
Alchemilla retinervis	6
Parnassia palustris	4
Agrostis alba	4

Figure II-57 Sedge dominated wetland

3 NARIANIS VELI WETLANDS

Community type	Overgrazed Meadow
Plot No.	1
Plot size (m^2)	10
GPS Co-ordinates	4618603N / 8391972E
Altitude (m AMSL)	2055
Inclination	5^0
Structural Features	
Community height (cm)	40
Coverage of herblayer (%)	85
Number of higher plant species	21
Species	**Cover-abundance by Domin scale**
Herblayer	
Bromus variegatus	8
Festuca ovina	7
Alchemilla caucasica	6
Trifolium ambiguum	6
Trifolium canescens	6
Ranunculus oreophilus	5
Veronica gentianoides	5
Taraxacum stevenii	5
Carum caucasicum	5
Achillea millefolium	5
Sibbaldia parviflora	4
Draba sibirica	3
Centaurea fischeri	3
Cirsium rhizocephalum	3
Barbarea vulgaris	2
Veronica ceratocarpa	2
Pedicularis comosa	2
Urtica dioica	2
Thymus grossheimii	2
Matricaria caucasica	1
Gagea anisanthos	1

Figure II-58 Overgrazed meadow

Community type	Wet Meadow
Plot No.	2
Plot size (m^2)	10
GPS Co-ordinates	4618402N / 8390789E
Altitude (m AMSL)	2050
Inclination	0^0
Structural Features	
Community height (cm)	30
Coverage of herblayer (%)	90
Number of higher plant species	14
Species	**Cover-abundance by Domin scale**
Herblayer	
Carex dacica	7
Luzula pseudosudetica	7
Alchemilla caucasica	6
Ranunculus baidarae	5
Trifolium canescens	4
Potentilla crantzii	3
Barbarea vulgaris	2
Centaurea fischeri	3
Draba sibirica	3
Taraxacum stevenii	2
Ranunculus elegans	2
Primula luteola	2
Gentiana angulosa	2
Betonica macrantha	2

Figure II-59 Wet Meadow

Community type	Wet Meadow
Plot No.	3
Plot size (m^2)	10
GPS Co-ordinates	4618302N / 8390197E
Altitude (m AMSL)	2050
Inclination	0^0
Structural Features	
Community height (cm)	30
Coverage of herblayer (%)	90
Number of higher plant species	17
Species	**Cover-abundance by Domin scale**
Herblayer	
Luzula pseudosudetica	8
Alchemilla caucasica	7
Carum caucasicum	7
Trifolium ambiguum	6
Taraxacum stevenii	5
Cirsium rhizocephalum	4
Ranunculus baidarae	3
Scilla rosenii	3
Veronica gentianoides	3
Gagea anisanthos	3
Pedicularis comosa	3
Barbarea vulgaris	2
Rumex alpestris	2
Asperula setosa	2
Sanguisorba officinalis	2
Potentilla crantzii	2
Ranunculus elegans	1

Figure II-60 Wet Meadow

Community type	**Wet Meadow (with drainage canal)**
Plot No.	4
Plot size (m^2)	10
GPS Co-ordinates	4618151N / 8389310E
Altitude (m AMSL)	2055
Inclination	0^0
Structural Features	
Community height (cm)	30
Coverage of herblayer (%)	80
Number of higher plant species	15
Species	**Cover-abundance by Domin scale**
Herblayer	
Carex dacica	7
Luzula pseudosudetica	7
Alchemilla caucasica	6
Ranunculus baidarae	5
Carex buekii	4
Alisma arcuatum	4
Barbarea vulgaris	3
Cirsium rhizocephalum	3
Taraxacum stevenii	3
Scilla rosenii	3
Lemna minor	3
Ranunculus elegans	2
Pedicularis comosa	2
Asperula setosa	2
Gagea anisanthos	2

Figure II-61 Wet meadow (with drainage canal)

Community type	Grazed Meadow
Plot No.	5
Plot size (m^2)	10
GPS Co-ordinates	4618074N / 8388118E
Altitude (m AMSL)	2055
Inclination	10^0
Structural Features	
Community height (cm)	40
Coverage of herblayer (%)	90
Number of higher plant species	20
Species	**Cover-abundance by Domin scale**
Herblayer	
Bromopsis variegata	8
Trifolium ambiguum	6
Ranunculus oreophilus	6
Papaver oreophilus	5
Veronica gentianoides	5
Asperula setosa	4
Thymus grossheimii	4
Cirsium rhizocephalum	4
Taraxacum stevenii	4
Pedicularis comosa	3
Alchemilla caucasica	3
Betonica macrantha	3
Centaurea fischeri	3
Myosotis caespitosa	3
Potentilla crantzii	3
Plantago lanceolata	2
Draba sibirica	2
Pedicularis wilhelmsiana	2
Anemonastrum fasciculatum	2
Dactylorhiza euxina	1

Figure II-62 Grazed Meadow

4 AREA FROM TSKHRATSKARO PASS TO TSIKHISJVARI

Community type	Heavily Overgrazed Alpine Meadow
Plot No.	1
Plot size (m^2)	10
GPS Co-ordinates	4617370N / 8375802E
Altitude (m AMSL)	2450
Aspect	West
Inclination	2^0
Structural Features	
Height of herblayer (cm)	10
Coverage of herblayer (%)	90
Coverage of mosslayer (%)	0
Number of higher plant species	14
Species	**Cover-abundance by Domin scale**
Herblayer	
Poa alpina	5
Carex huetiana	5
Koeleria albovii	5
Trifolium ambiguum	4
Taraxacum porphyranthum	3
Veronica gentianoides	3
Matricaria caucasica	3
Carum caucasicum	3
Alchemilla caucasica	3
Cerastium purpurascens	3
Ranunculus oreophilus	3
Luzula pseudosudetica	3
Agrostis tenuis	3
Sibbaldia semiglabra	3

Figure II-63 Heavily overgrazed alpine meadow

Community type	Crook-Stem Birch Forest
Plot No.	2
Plot size (m^2)	400
GPS Co-ordinates	4617484N / 8375777E
Altitude (m AMSL)	2400
Aspect	North-West
Inclination	20^0
Structural Features	
Max DBH (cm)	12
Average DBH (cm)	10
Max height of trees (m)	7
Average height (m)	5
Number of trees (per plot)	5
Coverage of treelayer (%)	30
Coverage of shrublayer (%)	50
Coverage of herblayer (%)	60
Coverage of mosslayer (%)	0
Number of higher plant species	18
Species	**Cover-abundance by Domin scale**
Treelayer	
Betula litwinowii	7
Salix caprea	7
Sorbus caucasigena	5
Shrublayer	
Rhododendron caucasicum	8
Vaccinium myrtillus	5
Vaccinium vitis-idaea	5
Rosa sp.	+
Herblayer	
Heracleum wilhelmsii	5
Calamagrostis arundinacea	5
Geranium sylvaticum	5
Swertia iberica	4
Doronicum macrophyllum	4
Rumex alpinus	4
Athyrium filix-femina	4
Alchemilla laeta	4
Trollius ranunculinus	4
Anemonastrum fasciculatum	4
Ranunculus oreophilus	4

Figure II-64 Crook-Stem Birch Forest

Community type	**Variegated Fescue Meadow**
Plot No.	3
Plot size (m^2)	10
GPS Co-ordinates	4617558N / 8375760E
Altitude (m AMSL)	2370
Aspect	South-West
Inclination	35^0
Structural Features	
Height of herblayer (cm)	25
Coverage of herblayer (%)	90
Coverage of mosslayer (%)	0
Number of higher plant species	18
Species	**Cover-abundance by Domin scale**
Herblayer	
Festuca woronowii	7
Centaurea fischeri	4
Alchemilla caucasica	4
Bromopsis variegata	4
Agrostis tenuis	4
Campanula collina	4
Thymus collinus	4
Calamagrostiss arundinacea	+
Carex tristis	+
Luzula spicata	+
Trifolium ambiguum	+
Carum caucasicum	+
Pastinaca armena	+
Myosotis alpestris	+
Cerastium purpurascens	+
Silene ruprechtii	+
Pimpinella rhodantha	+
Taraxacum porphyranthum	+

Figure II-65 Variegated fescue meadow

Community type	***Rhododendron caucasicum* scrub**
Plot No.	4
Plot size (m^2)	100
GPS Co-ordinates	4617685N / 8375733E
Altitude (m AMSL)	2300
Aspect	North-West
Inclination	40^0
Structural Features	
Height of shrublayer (cm)	60
Coverage of shrublayer	100
Coverage of herblayer (%)	70
Coverage of mosslayer (%)	0
Number of higher plant species	22
Species	**Cover-abundance by Domin scale**
Shrublayer	
Rhododendron caucasicum	9
Vaccinium vitis-idaea	4
Vaccinum myrtillus	4
Herblayer	
Betonica macrantha	5
Alchemilla laeta	5
Polygonum carneum	5
Festuca varia	4
Doronicum macrophyllum	4
Cirsium horridum	4
Geranium sylvaticum	4
Veratrum lobelianum	4
Calamagrostis arundinacea	4
Myosotis alpestris	4
Vicia balansae	3
Cephalaria gigantea	3
Chaerophyllum roseum	3
Aconitum orientale	3
Oxalis acetosella	3
Trifolium ambiguum	3
Valeriana alpestris	3
Arabis brachycarpa	3
Helictotrichon pubescens	+

Figure II-66 *Rhododendron caucasicum* scrub

Community type	**Crook-Stem Birch Forest**
Plot No.	5
Plot size (m^2)	400
GPS Co-ordinates	4617983N / 8375741E
Altitude (m AMSL)	2200
Aspect	North-West
Inclination	30^0
Structural Features	
Max DBH (cm)	20
Average DBH (cm)	15
Max height of trees (m)	10
Average height (m)	7
Number of trees (per plot)	5
Coverage of treelayer (%)	30
Coverage of shrublayer (%)	20
Coverage of herblayer (%)	70
Coverage of mosslayer (%)	0
Number of higher plant species	15
Species	**Cover-abundance by Domin scale**
Treelayer	
Betula litwinowii	9
Salix caprea	4
Sorbus caucasigena	4
Shrublayer	
Rhododendron caucasicum	8
Vaccinium myrtillus	5
Vaccinium vitis-idaea	5
Herblayer	
Heracleum wilhelmsii	9
Calamagrostis arundinacea	4
Athyrium filix-femina	4
Rumex alpinus	4
Aconitum nasatum	3
Doronicum macrophyllum	3
Anemone fasciculata	3
Trollius ranunculinus	3
Ranunculus caucasicus	3

Figure II-67 Crook-stem birch forest

Community type	Hay Meadow
Plot No.	6
Plot size (m^2)	10
GPS Co-ordinates	4618878N / 8375518E
Altitude (m AMSL)	1900
Aspect	West
Inclination	3^0
Structural Features	
Height of herblayer (cm)	90
Coverage of herblayer (%)	100
Coverage of mosslayer (%)	0
Number of higher plant species	19
Species	**Cover-abundance by Domin scale**
Herblayer	
Betonica macrantha	6
Astrantia biebersteinii	6
Veratrum lobelianum	4
Dactylorhiza euxina	4
Polygonum carneum	3
Doronicum macrophyllum	3
Myosotis sylvatica	3
Ranunculus caucasicus	3
Geranium sylvaticum	3
Trifolium pratense	3
Cephalaria gigantea	3
Draba repens	3
Anemonastrum fasciculatum	3
Sedum oppositifolium	+
Achillea millefolium	+
Draba nemorosa	+
Veronica chamaedrys	+
Viola tricolor	+
Veronica filiformis	+

Figure II-68 Hay meadow

Community type	**Thinned Grazed Pine Forest with High-Mountainous Maple**
Plot No.	7
Plot size (m^2)	400
GPS Co-ordinates	4620316N / 8374203E
Altitude (m AMSL)	1770
Aspect	North-West
Inclination	3^0
Structural Features	
Max DBH (cm)	50
Average DBH (cm)	20
Max height of trees (m)	20
Average height (m)	15
Number of trees (per plot)	4
Coverage of treelayer (%)	15
Coverage of shrublayer (%)	0
Coverage of herblayer (%)	90
Coverage of mosslayer (%)	0
Number of higher plant species	18
Species	**Cover-abundance by Domin scale**
Treelayer	
Pinus sylvestris	9
Acer trautvetterii	4
Shrublayer	
No shrub species has been recorded	
Herblayer	
Phleum pratense	5
Agrostis tenuis	5
Galanthus caucasicus	5
Taraxacum officinale	5
Trifolium repens	4
Caltha palustris	4
Cruciata laevipes	3
Cardamine palustris	3
Alchemilla laeta	3
Ranunculus caucasicus	3
Chrysosplenium sp.	3
Rumex sp.	3
Geum rivale	3
Lysimachia sp.	3
Saxifraga cymbalaria	3
Primula macrocalyx	3

Figure II-69 Thinned grazed pine forest with high-mountainous maple

Forest type	**Thinned Pine Forest**
Plot No.	8
Plot size (m^2)	400
GPS Co-ordinates	4621339N / 8373238E
Altitude (m AMSL)	1740
Aspect	South
Inclination	5^0
Structural Features	
Max DBH (cm)	45
Average DBH (cm)	30
Max height of trees (m)	35
Average height (m)	30
Number of trees (per plot)	6
Coverage of treelayer (%)	30
Coverage of shrublayer (%)	5
Coverage of herblayer (%)	80
Coverage of mosslayer (%)	0
Number of higher plant species	12
Species	**Cover-abundance by Domin scale**
Treelayer	
Pinus sylvestris	8
Pyrus caucasicus	6
Picea orientalis	4
Shrublayer	
Salix caprea	10
Herblayer	
Veratrum lobelianum	5
Primula ruprechtii	5
Taraxacum vulgare	5
Trifolium repens	5
Alchemilla sp.	5
Carex sylvatica	5
Veronica chamaedrys	5
Plantago lanceolata	5

Figure II-70 Thinned pine forest

Forest type	Pine Forest
Plot No.	9
Plot size (m^2)	400
GPS Co-ordinates	4621358N / 8373144E
Altitude (m AMSL)	1740
Aspect	South-East
Inclination	3^0
Structural Features	
Max DBH (cm)	45
Average DBH (cm)	35
Max height of trees (m)	40
Average height (m)	40
Number of trees (per plot)	12
Coverage of treelayer (%)	45
Coverage of shrublayer (%)	5
Coverage of herblayer (%)	60
Coverage of mosslayer (%)	3
Number of higher plant species	13
Species	**Cover-abundance by Domin scale**
Treelayer	
Pinus sylvestris	7
Pyrus caucasica	6
Betula pendula	5
Fagus orientalis	5
Shrublayer	
Corylus avellana	10
Herblayer	
Dentaria quinquefolia	6
Poa nemoralis	4
Oxalis acetosella	4
Orchis sp.	4
Lamium amplexicaule	4
Veratrum lobelianum	4
Fragaria viridis	4
Cardamine pectinata	4

Figure II-71 Pine forest

Forest type	Beech Forest with Pine
Plot No.	10
Plot size (m^2)	400
GPS Co-ordinates	4621032N / 8371878E
Altitude (m AMSL)	1750
Aspect	East
Inclination	10^0
Structural Features	
Max DBH (cm)	54
Average DBH (cm)	20
Max height of trees (m)	40
Average height (m)	35
Number of trees (per plot)	16
Coverage of treelayer (%)	40
Coverage of shrublayer (%)	5
Coverage of herblayer (%)	80
Coverage of mosslayer (%)	0
Number of higher plant species	16
Species	**Cover-abundance by Domin scale**
Treelayer	
Fagus orientalis	9
Pinus sylvestris	5
Betula pendula	4
Shrublayer	
Corylus avellana	10
Ribes biebersteinii	+
Herblayer	
Veratrum lobelianum	8
Dentaria quinquefolia	5
Oxalis acetosella	4
Poa nemoralis	3
Festuca drymeja	3
Alchemilla sp.	3
Geranium robertianum	3
Anemonoides caucasica	3
Galium odoratum	3
Gentiana schistocalyx	+
Myosotis sylvatica	+

Figure II-72 Beech forest with pine

Forest type	Thinned Pine Forest
Plot No.	11
Plot size (m^2)	400
GPS Co-ordinates	4620842N / 8371255E
Altitude (m AMSL)	1720
Aspect	South
Inclination	3^0
Structural Features	
Max DBH (cm)	60
Average DBH (cm)	33
Max height of trees (m)	45
Average height (m)	40
Number of trees (per plot)	11
Coverage of treelayer (%)	20
Coverage of shrublayer (%)	5
Coverage of herblayer (%)	90
Coverage of mosslayer (%)	0
Number of higher plant species	16
Species	**Cover-abundance by Domin scale**
Treelayer	
Pinus sylvestris	9
Carpinus caucasica	4
Shrublayer	
Corylus avellana	9
Salix caprea	4
Herblayer	
Poa nemoralis	5
Lamium amplexicaule	5
Taraxacum vulgare	5
Alchemilla sp.	5
Leontodon caucasicus	5
Ranunculus oreophilus	5
Veratrum lobelianum	5
Trifolium repens	5
Fragaria viridis	5
Stellaria media	5
Anemonoides caucasica	5
Betonica macrantha	+

Figure II-73 Thinned pine forest

Forest type	Beech Forest with Pine
Plot No.	12
Plot size (m^2)	400
GPS Co-ordinates	4621307N / 8369268E
Altitude (m AMSL)	1750
Aspect	North-West
Inclination	9^0
Structural Features	
Max DBH (cm)	60
Average DBH (cm)	45
Max height of trees (m)	40
Average height (m)	38
Number of trees (per plot)	10
Coverage of treelayer (%)	60
Coverage of shrublayer (%)	0
Coverage of herblayer (%)	50
Coverage of mosslayer (%)	0
Number of higher plant species	12
Species	**Cover-abundance by Domin scale**
Treelayer	
Fagus orientalis	9
Pinus sylvestris	4
Shrublayer	
No shrub species has been recorded	
Herblayer	
Dentaria quenfuefolia	5
Primula ruprechtii	5
Primula macrocalyx	5
Oxalis acetosella	5
Myosotis sylvatica	3
Plantago lanceolata	3
Scilla rosenii	3
Ranunculus caucasicus	3
Ranunculus repens	3
Galium odoratum	3

Figure II-74 Beech forest with pine

Forest type	Beech Forest with Pine
Plot No.	13
Plot size (m^2)	400
GPS Co-ordinates	4621477N / 8368176E
Altitude (m AMSL)	1770
Aspect	North-West
Inclination	5^0
Structural Features	
Max DBH (cm)	70
Average DBH (cm)	45
Max height of trees (m)	45
Average height (m)	40
Number of trees (per plot)	10
Coverage of treelayer (%)	60
Coverage of shrublayer (%)	0
Coverage of herblayer (%)	50
Coverage of mosslayer (%)	1
Number of higher plant species	16
Species	**Cover-abundance by Domin scale**
Treelayer	
Fagus orientalis	9
Pinus sylvestris	4
Shrublayer	
No shrub species has been recorded	
Herblayer	
Dentaria quenfuefolia	5
Primula ruprechtii	5
Primula macrocalyx	4
Oxalis acetosella	4
Alchemilla sp.	4
Festuca drymeja	4
Fragaria viridis	4
Carex sp.	4
Myosotis sylvatica	4
Plantago lanceolata	3
Lamium amplexicaule	3
Ranunculus caucasicus	3
Ranunculus repens	3
Galium odoratum	3

Figure II-75 Beech forest with pine

Forest type	Crook-Stem Forest of Birch
Plot No.	14
Plot size (m^2)	400
GPS Co-ordinates	4622922N / 8364991E
Altitude (m AMSL)	2250
Aspect	North-West
Inclination	15^0
Structural Features	
Max DBH (cm)	20
Average DBH (cm)	15
Max height of trees (m)	8
Average height (m)	6
Number of trees (per plot)	7
Coverage of treelayer (%)	40
Coverage of shrublayer (%)	5
Coverage of herblayer (%)	70
Coverage of mosslayer (%)	0
Number of higher plant species	7
Species	**Cover-abundance by Domin scale**
Treelayer	
Betula litwinowii	9
Salix caprea	5
Shrublayer	
Rhododendron caucasicum	10
Herblayer	
Calamagrostis arundinacea	8
Astrantia maxima	4
Polygonum carneum	4
Betonica grandiflora	4

Figure II-76 Crook-stem birch forest

Community type	Alpine Meadow
Plot No.	15
Plot size (m^2)	10
GPS Co-ordinates	4623194N / 8364924E
Altitude (m AMSL)	2320
Aspect	South-East
Inclination	25^0
Structural Features	
Height of herblayer (cm)	15
Coverage of herblayer (%)	70
Coverage of mosslayer (%)	0
Number of higher plant species	14
Species	**Cover-abundance by Domin scale**
Herblayer	
Alchemilla caucasica	5
Koeleria albovii	4
Poa alpina	4
Festuca supina	4
Carex tristis	4
Primula ruprechtii	4
Trifolium ambiguum	4
Scilla rosenii	4
Taraxacum stevenii	4
Cirsium frickii	4
Carum caucasicum	4
Polygonum viviparum	4
Veronica gentianoides	4
Centaurea fischeri	3

Figure II-77 Alpine meadow

Community type	Alpine Meadow
Plot No.	16
Plot size (m^2)	10
GPS Co-ordinates	4623440N / 8363800E
Altitude (m AMSL)	2350
Aspect	South
Inclination	10^0
Structural Features	
Height of herblayer (cm)	15
Coverage of herblayer (%)	95
Coverage of mosslayer (%)	0
Number of higher plant species	17
Species	**Cover-abundance by Domin scale**
Herblayer	
Scilla rosenii	5
Agrostis tenuis	4
Festuca supina	4
Koeleria albovii	4
Alchemilla caucasica	4
Poa alpina	4
Carex tristis	4
Campanula tridentata	4
Trifolium ambiguum	4
Draba repens	4
Primula ruprechtii	4
Centaurea fischeri	4
Taraxacum stevenii	4
Gentiana angulosa	4
Carum caucasicum	4
Veronica gentianoides	4
Cirsium frickii	1

Figure II-78 Alpine meadow

5 AREA FROM SAKIRE TO RIVER POTSKHOVI EAST CROSSING

Forest type	Thinned Spruce-Pine Forest
Plot No.	1
Plot size (m^2)	400
GPS Co-ordinates	4623098N / 8361826E
Altitude (m AMSL)	1950
Aspect	North-East
Inclination	$3\text{-}5^0$
Structural Features	
Max DBH (cm)	60
Average DBH (cm)	45
Max height of trees (m)	20
Average height (m)	18
Number of trees (per plot)	10
Coverage of treelayer (%)	50
Coverage of shrublayer (%)	40
Coverage of herblayer (%)	85
Coverage of mosslayer (%)	15
Number of higher plant species	11
Species	**Cover-abundance by Domin scale**
Treelayer	
Picea orientalis	8
Pinus sylvestris	7
Shrublayer	
Picea orientalis (saplings)	9
Grossularia reclinata	4
Herblayer	
Festuca drymeja	7
Carex digitata	6
Anemone caucasica	4
Alchemilla sp.	4
Digitalis ferruginea	3
Primula macrocalyx	3
Ajuga genevensis	+
Dryopteris filix-mas	+

Figure II-79 Thinned spruce-pine forest

Forest type	Spruce Forest
Plot No.	2
Plot size (m^2)	400
GPS Co-ordinates	4623181N / 8361568E
Altitude (m AMSL)	1850
Aspect	North-West
Inclination	13^0
Structural Features	
Max DBH (cm)	60
Average DBH (cm)	45
Max height of trees (m)	25
Average height (m)	22
Number of trees (per plot)	15
Coverage of treelayer (%)	70
Coverage of shrublayer (%)	25
Coverage of herblayer (%)	25
Coverage of mosslayer (%)	65
Number of higher plant species	6
Species	**Cover-abundance by Domin scale**
Treelayer	
Picea orientalis	10
Betula pendula	+
Shrublayer	
Picea orientalis (saplings)	10
Abies nordmanniana (saplings)	1
Herblayer	
Oxalis acetosella	7
Bromopsis inermis	7
Hieracium sp.	+

Figure II-80 Spruce forest

Forest type	Spruce Forest
Plot No.	3
Plot size (m^2)	400
GPS Co-ordinates	4623160N / 8360861E
Altitude (m AMSL)	1740
Aspect	North-West
Inclination	10^0
Structural Features	
Max DBH (cm)	60
Average DBH (cm)	40
Max height of trees (m)	30
Average height (m)	20
Number of trees (per plot)	13
Coverage of treelayer (%)	80
Coverage of shrublayer (%)	20
Coverage of herblayer (%)	20
Coverage of mosslayer (%)	30
Number of higher plant species	4
Species	**Cover-abundance by Domin scale**
Treelayer	
Picea orientalis	9
Pinus sylvestris	4
Shrublayer	
Picea orientalis (saplings)	10
Herblayer	
Oxalis acetosella	8
Bromopsis inermis	5

Figure II-81 Spruce forest

Forest type	**Thinned Spruce Forest**
Plot No.	4
Plot size (m^2)	400
GPS Co-ordinates	4623202N / 8359840E
Altitude (m AMSL)	1680
Aspect	North-West
Inclination	$12\text{-}15^0$
Structural Features	
Max DBH (cm)	70
Average DBH (cm)	50
Max height of trees (m)	25
Average height (m)	20
Number of trees (per plot)	9
Coverage of treelayer (%)	50
Coverage of shrublayer (%)	0
Coverage of herblayer (%)	40
Coverage of mosslayer (%)	60
Number of higher plant species	6
Species	**Cover-abundance by Domin scale**
Treelayer	
Picea orientalis	9
Abies nordmanniana	4
Acer trautvetteri	4
Shrublayer	
No shrub species have been recorded	
Herblayer	
Poa nemoralis	9
Phleum pratense	4
Primula macrocalyx	4

Figure II-82 Thinned spruce forest

Forest type	**Thinned Spruce Forest**
Plot No.	5
Plot size (m^2)	400
GPS Co-ordinates	4622803N / 8357289E
Altitude (m AMSL)	1600
Aspect	North-East
Inclination	13^0
Structural Features	
Max DBH (cm)	55
Average DBH (cm)	35
Max height of trees (m)	30
Average height (m)	22
Number of trees (per plot)	13
Coverage of treelayer (%)	50
Coverage of shrublayer (%)	50
Coverage of herblayer (%)	50
Coverage of mosslayer (%)	30
Number of higher plant species	6
Species	**Cover-abundance by Domin scale**
Treelayer	
Picea orientalis	10
Shrublayer	
Picea orientalis (saplings)	10
Herblayer	
Poa nemoralis	8
Carex hallerana	6
Trifolium ambiguum	4
Fragaria viridis	4
Hieracium sp.	2

Figure II-83 Thinned spruce forest

Forest type	**Spruce Forest**
Plot No.	6
Plot size (m^2)	400
GPS Co-ordinates	4622585N / 8356186E
Altitude (m AMSL)	1550
Aspect	North
Inclination	18^0
Structural Features	
Max DBH (cm)	40
Average DBH (cm)	26
Max height of trees (m)	25
Average height (m)	18
Number of trees (per plot)	15
Coverage of treelayer (%)	80
Coverage of shrublayer (%)	20
Coverage of herblayer (%)	50
Coverage of mosslayer (%)	0
Number of higher plant species	8
Species	**Cover-abundance by Domin scale**
Treelayer	
Picea orientalis	10
Betula pendula	+
Shrublayer	
Corylus avellana	10
Herblayer	
Carex digitata	7
Poa nemoralis	5
Trifolium pratense	5
Primula macrocalyx	4
Hieracium sp.	+

Figure II-84 Spruce forest

Forest type	Thinned Spruce-Fir Forest
Plot No.	7
Plot size (m^2)	400
GPS Co-ordinates	4622855N / 8353825E
Altitude (m AMSL)	1550
Aspect	South
Inclination	4°
Structural Features	
Max DBH (cm)	30
Average DBH (cm)	23
Max height of trees (m)	30
Average height (m)	25
Number of trees (per plot)	9
Coverage of treelayer (%)	40
Coverage of shrublayer (%)	25
Coverage of herblayer (%)	80
Coverage of mosslayer (%)	10
Number of higher plant species	14
Species	**Cover-abundance by Domin scale**
Treelayer	
Picea orientalis	8
Abies nordmanniana	5
Shrublayer	
Rosa canina	7
Crataegus curvisepala	7
Picea orientalis (saplings)	4
Abies nordmanniana (saplings)	1
Herblayer	
Bromus benekenii	7
Fragaria viridis	4
Primula macrocalyx	4
Trifolium ambiguum	4
Carex remota	4
Capsella bursa-pastoris	3
Thlaspi sp.	3
Thymus sp.	3
Plantago lanceolata	3
Viola kitaibeliana	3

Figure II-85 Thinned spruce-fir forest

Forest type	Spruce-Fir Forest
Plot No.	8
Plot size (m^2)	400
GPS Co-ordinates	4622966N / 8353456E
Altitude (m AMSL)	1425
Aspect	North-West
Inclination	12°
Structural Features	
Max DBH (cm)	62
Average DBH (cm)	45
Max height of trees (m)	30
Average height (m)	25
Number of trees (per plot)	15
Coverage of treelayer (%)	70
Coverage of shrublayer (%)	30
Coverage of herblayer (%)	30
Coverage of mosslayer (%)	30
Number of higher plant species	14
Species	**Cover-abundance by Domin scale**
Treelayer	
Picea orientalis	9
Abies nordmanniana	5
Betula pendula	+
Shrublayer	
Corylus avellana	7
Abies nordmanniana (saplings)	6
Picea orientalis (saplings)	5
Salix caprea	4
Herblayer	
Carex remota	7
Poa nemoralis	6
Oxalis acetosella	4
Primula macrocalyx	4
Fragaria viridis	3
Galium odoratum	3
Viola sp.	1
Taraxacum officinale	1
Inula sp.	+

Figure II-86 Spruce-fir forest

Forest type	Fragment of High-Mountainous Oak Forest
Plot No.	9
Plot size (m^2)	400
GPS Co-ordinates	4621671N / 8350876E
Altitude (m AMSL)	1250
Aspect	South-East
Inclination	12°
Structural Features	
Max DBH (cm)	40
Average DBH (cm)	25
Max height of trees (m)	25
Average height (m)	18
Number of trees (per plot)	11
Coverage of treelayer (%)	40
Coverage of shrublayer (%)	50
Coverage of herblayer (%)	70
Coverage of mosslayer (%)	0
Number of higher plant species	18
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus macranthera	9
Fraxinus excelsior	4
Acer campestre	4
Pyrus caucasica	4
Shrublayer	
Lonicera caucasica	6
Corylus avellana	5
Cornus mas	5
Crataegus curvisepala	5
Rosa canina	4
Herblayer	
Carex halleriana	6
Poa nemoralis	6
Anthriscus nemorosa	5
Primula macrocalyx	4
Trifolium pratense	4
Galium odoratum	3
Fragaria viridis	3
Viola sp.	2
Prunella vulgaris	1

Figure II-87 Fragment of high-mountainous oak forest

Forest type	Fragment of High-Mountainous Oak Forest
Plot No.	10
Plot size (m^2)	400
GPS Co-ordinates	4621579N / 8350746E
Altitude (m AMSL)	1260
Aspect	South-East
Inclination	10°
Structural Features	
Max DBH (cm)	45
Average DBH (cm)	27
Max height of trees (m)	27
Average height (m)	19
Number of trees (per plot)	10
Coverage of treelayer (%)	40
Coverage of shrublayer (%)	55
Coverage of herblayer (%)	60
Coverage of mosslayer (%)	0
Number of higher plant species	21
Species	**Cover-abundance by Domin scale**
Treelayer	
Quercus macranthera	9
Fraxinus excelsior	4
Acer campestre	4
Pyrus caucasica	4
Shrublayer	
Lonicera caucasica	6
Corylus avellana	5
Cornus mas	5
Crataegus curvisepala	4
Hipopphaë rhamnoides	4
Rosa canina	4
Ligustrum vulgare	1
Herblayer	
Carex halleriana	6
Poa nemoralis	6
Anthriscus nemorosa	5
Primula macrocalyx	4
Trifolium pratense	4
Galium odoratum	3
Fragaria viridis	3
Viola sp.	2
Prunella vulgaris	1
Astrantia maxima	+

Figure II-88 Fragment of high-mountainous oak forest

Community type	Sea buckthorn dominated shrubwood
Plot No.	11
Plot size (m^2)	100
GPS Co-ordinates	4621096N / 8350306E
Altitude (m AMSL)	1420
Aspect	South-East
Inclination	8°
Structural Features	
Max DBH (cm)	30
Average DBH (cm)	25
Max height of trees (m)	12
Average height (m)	9
Number of trees (per plot)	1
Coverage of treelayer (%)	20
Coverage of shrublayer (%)	90
Coverage of herblayer (%)	30
Coverage of mosslayer (%)	0
Number of higher plant species	21
Species	**Cover-abundance by Domin scale**
Treelayer	
Pyrus caucasica	9
Fraxinus excelsior	4
Quercus macranthera	+
Shrublayer	
Hipopphaë rhamnoides	8
Rosa canina	4
Crataegus curvisepala	4
Berberis vulgaris	4
Viburnum opulus	4
Cornus mas	4
Ligustrum vulgare	4
Prunus spinosa	4
Corylus avellana	4
Lonicera caprifolium	4
Juniperus oxycedrus	2
Herblayer	
Poa pratensis	6
Dactylis glomerata	6
Trifolium ambiguum	5
Cruciata laevipes	4
Plantago lanceolata	4
Ajuga reptans	3
Cirsium sp.	1

Figure II-89 Sea buckthorn dominated shrubwood

Forest type	**Thinned Riparian Forest of Black Poplar**
Plot No.	12
Plot size (m^2)	400
GPS Co-ordinates	4616332N / 8339138E
Altitude (m AMSL)	950
Aspect	South-East
Inclination	2°
Structural Features	
Max DBH (cm)	60
Average DBH (cm)	40
Max height of trees (m)	20
Average height (m)	15
Number of trees (per plot)	8
Coverage of treelayer (%)	40
Coverage of shrublayer (%)	40
Coverage of herblayer (%)	95
Coverage of mosslayer (%)	0
Number of higher plant species	20
Species	**Cover-abundance by Domin scale**
Treelayer	
Populus nigra	8
Salix alba	5
Salix triandra	4
Alnus barbata	4
Shrublayer	
Hipopphaë rhamnoides	6
Salix purpurea	6
Rubus caesius	5
Tamarix smyrnensis	4
Herblayer	
Festuca pratensis	5
Poa pratensis	5
Poa bulbosa	5
Phleum pratense	4
Trifolium pratense	4
Bromus sterilis	4
Capsella bursa pastoris	3
Rubia tinctoria	3
Glycyrrhiza echinata	3
Leucanthemum vulgare	3
Thesium ramosum	3
Inula hellenium	1

Figure II-90 Thinned riparian forest of black poplar

Forest type	**Riparian Forest of Black Poplar**
Plot No.	13
Plot size (m^2)	400
GPS Co-ordinates	4614948N / 8323225E
Altitude (m AMSL)	950
Aspect	South
Inclination	2°
Structural Features	
Max DBH (cm)	40
Average DBH (cm)	20
Max height of trees (m)	25
Average height (m)	15
Number of trees (per plot)	11
Coverage of treelayer (%)	70
Coverage of shrublayer (%)	25
Coverage of herblayer (%)	90
Coverage of mosslayer (%)	0
Number of higher plant species	17
Species	**Cover-abundance by Domin scale**
Treelayer	
Populus nigra	8
Salix alba	5
Alnus barbata	5
Salix triandra	4
Shrublayer	
Hipopphaë rhamnoides	7
Rosa canina	6
Rubus caesius	6
Herblayer	
Trifolium arvense	6
Poa pratensis	5
Festuca pratense	5
Equisetum arvense	4
Bromus sterilis	4
Humulus lupulus	4
Thesium ramosum	2
Arctium lappa	1
Leucanthemum vulgare	+
Inula hellenium	+

Figure II-91 Riparian forest of black poplar

Forest type	Riparian Forest of Willow
Plot No.	14
Plot size (m^2)	400
GPS Co-ordinates	4614679N / 8323204E
Altitude (m AMSL)	950
Aspect	North
Inclination	2°
Structural Features	
Max DBH (cm)	60
Average DBH (cm)	12
Max height of trees (m)	20
Average height (m)	10
Number of trees (per plot)	14
Coverage of treelayer (%)	80
Coverage of shrublayer (%)	10
Coverage of herblayer (%)	70
Coverage of mosslayer (%)	0
Number of higher plant species	15
Species	**Cover-abundance by Domin scale**
Treelayer	
Salix triandra	8
Salix alba	5
Populus nigra	4
Alnus barbata	4
Shrublayer	
Rosa canina	5
Rubus caesius	5
Hipopphaë rhamnoides	5
Crataegus monogyna	5
Herblayer	
Poa pratensis	7
Carex sp.	7
Stellaria media	4
Urtica dioica	3
Geum urbanum	3
Cruciata laevipes	3
Artemisia absinthium	3

Figure II-92 Riparian forest of willow

Community type	Shibljiak/Open Meadow
Plot No.	15
Plot size (m^2)	100
GPS Co-ordinates	4614420N / 8323366E
Altitude (m AMSL)	980
Aspect	North
Inclination	14°
Structural Features	
Coverage of shrublayer (%)	50
Coverage of herblayer (%)	80
Coverage of mosslayer (%)	0
Number of higher plant species	20
Species	**Cover-abundance by Domin scale**
Shrublayer	
Spiraea hypericifolia	6
Rhamnus pallasii	5
Berberis vulgaris	5
Rosa canina	4
Cotoneaster racemiflora	4
Juniperus oxycedrus	4
Pyrus salicifolia	1
Herblayer	
Poa pratensis	6
Carex humilis	6
Bromus squarosus	5
Trifolium pratense	5
Globularia trichosantha	4
Thlaspi perfoliatum	3
Helianthemum nummularium	2
Primula macrocalyx	2
Glycyrrhiza echinata	2
Euphorbia boisseriana	1
Onosma armeniaca	1
Astragalus sp.	1
Inula germanica	+

Figure II-93 Shibljiak / open meadow

6 POTSKHOVI WEST CROSSING

Community type	Secondary Shrubland
Plot No.	1
Plot size (m^2)	100
GPS Co-ordinates	4611460N / 8320454E
Altitude (m AMSL)	1070
Aspect	East
Inclination	13^0
Structural Features	
Coverage of shrublayer (%)	70
Coverage of herblayer (%)	60
Coverage of mosslayer (%)	0
Number of higher plant species	10
Species	**Cover-abundance by Domin scale**
Shrublayer	
Hippophaë rhamnoides	6
Berberis vulgaris	4
Rhamnus cathartica	4
Rosa canina	4
Swida australis	4
Prunus divaricata	4
Ligustrum vulgare	4
Crataegus orientalis	1
Herblayer	
Poa pratensis	8
Carduus acanthoides	5

Figure II-94 Secondary shrubland

APPENDIX III PHASE II FAUNA REPORTS

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APPENDIX III PHASE II FAUNA REPORTS

1 INTRODUCTION

Detailed faunal surveys were undertaken at a number of locations along the proposed pipeline route where the preliminary evaluation highlighted potential significant issues with regard to the faunal distribution. These locations were:

- Marshes South-West of Kesalo (no longer along proposed route)
- Tetritskaro Area
- Eastern Part of Tsalka Reservoir and Lake Aligel
- Narianis Veli Wetlands, Ktsia wetlands and Tavkvetili mountain
- Tskhratskaro – Tiseli Area
- Riparian Areas at Mtkvari and Potskhovi Crossings

The surveys continued from spring to autumn 2001. The survey findings could have some limitations due to limited duration of the surveys, safety and security restrictions imposed on the fieldwork.

Key objectives of the Phase II fauna surveys are summarized as follows:

- Identification of species composition
- Assessment of abundance of large mammals and birds
- Assessment of surveyed sites as wildlife habitats
- Identification of likely migratory routes of large mammals where relevant.

The study areas covered by the faunal surveys are shown on Figures III-18-23.

2 METHODOLOGY

Standard line transect counts were used for mammal counts described by Caughley (1977). Transect counts is a widely used method (Rudran & Foster 1996, Lancia *et al.* 1996, Rudran *et al.* 1996), which has the following advantages compared to other techniques:

- This method minimises the probability of recording the same individual / other object more than once
- It increases the probability of recording every animal / other object on the transect
- It is least invasive and least disturbing to animals.

Line transect sampling is suitable for populations with relatively low density. During line transect counts, an observer walks along a transect, defined in advance, and records all target animals on both sides, at the same time recording perpendicular distances from the object to the transect line. Transect sampling can be applied to both live animals and other identifiable objects such as nests, faeces, foot prints, marks, etc.

Special forms were used for field data collection. One form was completed on each transect. Field data were analysed using the computer program Distance 3.5 to determine the densities of the selected species. A special Habitat Assessment Form was designed and used throughout the survey. In addition, bird species were identified and recorded.

Table III-1 Line transect count sample form

Date	Location	Weather
Transect No.	Start Time	End Time
Start point	End Point	Transect length
Observer	Direction	

Species detected	Object	Age/Sex	No of objects (clusters)	Time of detection	Perpendicular dist. from the line	Note

Table III-2 Habitat assessment sample form

GPS Coordinates:	Date:
Habitat Type	
Terrain	
Slope	
Altitude	
Physical Features	
Plant Community Structure	
Water Availability	
Coordinates of Watering place	
Level of Use of Watering Place	
Types of Disturbance	
Type and Level of Degradation	
Notes	

Point counts were used during ornithological surveys. This technique involves conducting animal counts from a fixed location for a fixed time period (Sutherland 1997) and is commonly used for bird surveys, especially in open areas.

Sites of ornithological interest were surveyed twice, in different periods of migration season in order to collect as much information as possible on migratory water birds, which tend to arrive at different times.

All bird species present were identified and recorded with the aid of a scope. Information was collected to assess habitat status in terms of suitability for migratory water birds and overall disturbance.

The above methodology was amended for application in late migration season when the surveys were expected to provide data on resident species and late migrants (eg Onrithological Surveys at Narianis Veli and Ktsia wetlands and Mt. Tavkvetili, October 2001). The survey included three main components:

- Early morning ROW transects
- Migration watch
- Habitat specific surveys.

In addition the current status of habitats (especially the wetlands) was evaluated.

Early Morning RoW Transects (First Light)

The survey route commenced at the highest point on the ROW and extended all along the ROW to another highest point.

Two team members spaced themselves 40 m apart (20 m on either side of the centerline) and walked slowly through the vegetation, noting numbers and species of all birds that flushed or flew within 100 m. All precautions were made to avoid double-counting of the same individual birds.

Migration Watch

The focus of this survey was day-migrants, including various water birds and raptors.

The survey was conducted from an elevated point with a clear view of the surrounding area. Each member covered a pre-determined portion of the sky, agreeing beforehand on convenient dividing lines.

The count period was divided into three blocks of continuous observation for 45 min each with a 15 min break in between.

At the start of each block, observers recorded the time, location, and weather. For each bird observation data sheet included species, number, direction of flight (N, NE, E, SE, S, SW, W, NW), and habitat type if the bird(s) went to land.

Habitat Specific

This survey was expected to provide a more intensive measure of bird use in two main habitat types represented along the ROW. These habitats were the wetland and rhododendron shrubbery. Each of them was surveyed twice.

The first task was to establish an observation route within each distinctive habitat type. Each route was roughly rectangular in shape, 450 m X 300 m. There were 10 observation stations along each route, each separated by 150 m. These stations were flagged and numbered and the GPS coordinates were recorded. Bird observations were made on subsequent days.

On survey days, observers stood at each station for 10 min and recorded all birds seen or heard within 50 m. After 10 min they moved on to the next station.

3 MARSHES SOUTH-WEST OF KESALO

3.1 INTRODUCTION

The marshes in the vicinity of Kovu river were surveyed by a team of NACRES zoologists (G. Darchiashvili, L. Goshadze, J. Natradze) in late March - mid April 2001.

The study area represents a small section of marshes along the River Kovu with a total area of 5 km^2 (refer to Figure III-18). It is an open, slightly hilly area. The river banks are wet with some reed beds. The site is surrounded by agricultural lands.

The site was surveyed twice at a 20-day interval to obtain credible data on the use of the site by migratory birds since different bird species were likely to arrive at different times. Two transects were completed, covering a total length of 5 km. One field data collection form was completed on each transect. All bird species present on the marshes and / or adjacent fields were identified and recorded with the aid of a scope. Field data were analysed using the computer program Distance 3.5 to determine the densities of selected species. A Habitat Assessment Form was used to assess habitat status in terms of suitability for migratory water birds and overall disturbance.

It should be noted that this site is located along the rejected route option.

3.2 SURVEY RESULTS

3.2.1 Study area as wildlife habitat

The study area is under moderate level of human impact from livestock grazing and other forms of disturbance such as traffic and human presence. Nevertheless, food and shelter availability attracts large numbers of waterfowl and other birds that depend on wetlands. Water birds not only arrive during migration but are also present during the summer in relatively low numbers. The site is also important as a staging place for raptors. In addition to occurring during migration, marsh harriers may also nest on this site.

3.2.2 Species

Twenty-seven bird species were recorded during both surveys. Four species were observed only during the first visit (i.e. these 4 were not observed during the second round). The second round of the survey revealed the presence of 10 new species that were not observed during the first round. This confirms that various migratory birds arrive on the site in different periods of the migration season.

A list of bird species observed during the fieldwork is given in Table III-3. Some are protected by Afro-Eurasian Migratory Waterbird Agreement (AEWA). Black stork (*Ciconia nigra*, status - Crtically Endangered) and Great white heron (*Egretta alba*, status - Endangered) are also included in the Georgian Red Data Book (GRDB). Important game species, such as common snipe (*Gallinago gallinago*), Garganey (*Anas querquedula*) and mallard (*Anas platyrhynchos*) are especially numerous (over 100, 50 and 25 respectively on 5 km^2 area). Obtained results allow estimation of densities of some species recorded during the survey (refer to Table III-4).

Table III-3 Birds species recorded, Kesalo

No.	Species		Migratory	Breeding in Georgia[1]	Protected species
	Scientific name	Common name			
1	*Accipiter nisus*	Sparrow hawk	+	+	
2	*Anas platyrhynchos*	Mallard	+	+	AEWA
3	*Anas querquedula*	Garganey	+		AEWA
4	*Apus apus*	Swift		+	
5	*Ardea cinerea*	Grey heron		+	
6	*Buteo buteo*	Common buzzard	+	+	
7	*Buteo rufinus*	Long-legged buzzard	+	+	
8	*Ciconia ciconia*	White stork	+	+	AEWA
9	*Ciconia nigra*	Black stork	+	+	AEWA, GRDB
10	*Circus aeruginosus*	Marsh harrier	+	+	
11	*Corvus corax*	Raven		+	
12	*Corvus corone*	Hooded crow		+	
13	*Corvus monedula*	Jackdaw		+	
14	*Egretta alba*	Great white egret		+	GRDB
15	*Emberiza schoeniclus*	Reed bunting	+	+	
16	*Falco tinnunculus*	Kestrel	+	+	
17	*Gallinago gallinago*	Common snipe	+	+	AEWA
18	*Hirundo rustica*	Swallow	+	+	
19	*Luscinia svecica*		+	+	
20	*Miliaria calandra*	Corn bunting		+	
21	*Milvus migrans*	Black kite	+	+	
22	*Motacilla alba*	White wagtail		+	
23	*Motacilla flava*	Yellow wagtail		+	
24	*Pica pica*	Magpie		+	
25	*Sturnus vulgaris*	Starling		+	
26	*Upupa epops*	Hoopoe		+	
27	*Vanellus vanellus*	Lapwing	+	+	AEWA

[1] These species are known to breed in Georgia. However it was impossible to check whether they breed specifically on the study area since the survey was conducted during the non-breeding season

Figure III-1 Lapwing on marshes

Table III-4 Estimated densities of selected bird species, Kesalo

Species	Density per 1 km^2
Accipiter nisus	1.0
Anas platyrhynchos	4.7
Anas querquedula	10.0
Ardea cinerea	1.0
Buteo buteo	4.0
Buteo rufinus	1.0
Ciconia ciconia	1.3
Circus aeruginosus	1.1
Egretta alba	2.1
Falco tinnunculus	1.7
Gallinago gallinago	20.9
Milvus migrans	2.1
Vanellus vanellus	7.0

In addition, Caspian tortoise (*Mauremys caspica*) was noted in large numbers. Foxes (*Vulpes vulpes*) also appear to be abundant, apparently attracted by abundance of prey.

Figure III-2 Buzzards like other birds of prey are attracted to the site

3.3 CONCLUSIONS

The marshes, though occupying a small area, represent an important wildlife habitat, in particular for migratory and resident water birds. Despite human disturbance, the wetland appears to support large numbers of waterfowl including two GRDB species owing to the abundance in food and shelter.

4 TETRI TSKARO

4.1 INTRODUCTION

The Phase II faunal survey was carried out by a team of NACRES zoologists (I. Macharashvili, G. darchiashvili, I. Shavgulidze and L. Goashadze) in April 2001. The team members worked on a rotation basis with three members engaged at a time.

The study area comprises a forested section along the proposed pipeline route north and north-west of Tetri Tskaro to Bedeni Plateau, with a total area of approximately 40 km^2 (refer to Figure III-19). The altitudes range from 1,000 to 1,700 m. A total length of the pipeline route corridor crossing the study area is approximately 13 km.

The forests are dominated by oak, hornbeam and beech. The forests are characterised by diverse microhabitats such as small openings in the forest, forest edges, meadows, as well as woods of various structure and density, including plots of beech communities with little or no undergrowth, mixed beech and oak communities with under forest developed at various levels, etc. In addition, there is a small lake called Cherepanovskoe in the study area.

Five transects were completed, covering a total length of 40 km. One field data collection form was completed on each transect. Field data were analysed using the computer program Distance 3.5 to determine the densities of selected species. Habitat assessment forms were completed at 2-km intervals. In addition, bird species were identified and recorded.

4.2 SURVEY RESULTS

4.2.1 Study area as wildlife habitat

The terrain in the study area varies from flat to moderate slope with occasional gullies and rock formations. Forest structure is mostly simple with more or less developed undergrowth and occasional openings, which contribute to the mosaic of local habitats. Water is available throughout the area in the form of streams or natural springs. There is also a small lake.

Disturbance level varies from low to moderate and includes cattle grazing, domestic pig feeding, fuel wood collection, camping, etc. Forestry operations appear to be minimal. The forest is extremely rich in various berries and mast producing species such as oak and beech. In general, the site is in good condition and provides a perfect habitat for breeding birds and mammals including large mammals.

Figure III-3 Study area abounds in small rivers, Tetri Tskaro

In addition, the site can be considered as a bridge between two larger forested areas located north and west of Tetri Tskaro. The area located between villages Jigrasheni and Ivanovka appears to be particularly important for the integrity of the whole ecosystem and in particular, large mammal populations.

Contrary to the expectations, no birds were observed on lake Cherepanovskoe during both Phase I and II surveys. This can be accounted for by noise disturbance generated by a stonemasonry. Unfortunately, there is no data to assess importance of the lake as a wildlife habitat.

Figure III-4 Lake Cherepanovskoe

4.2.2 Species

In total, twenty-three bird species were recorded during the survey (Table III-5)

Table III-5 Bird species recorded, Tetri Tskaro

No.	Common Name	Scientific Name
1.	Skylark	*Alauda arvensis*
2.	Buzzard	*Buteo buteo*
3.	Rough-legged buzzard	*Buteo lagopus*
4.	Greenfinch	*Carduelis chloris*
5.	Treecreeper	*Certhia sp.*
6.	Wood pigeon	*Columba palumbus*
7.	Raven	*Corvus corax*
8.	Hooded crow	*Corvus corone*
9.	Great spotted woodpecker	*Dendrocopos major*
10.	Rock bunting	*Emberiza cia*
11.	Chaffinch	*Fringilla coelebs*
12.	Jay	*Garrulus glandarius*
13.	Coal tit	*Parus ater*
14.	Great tit	*Parus major*
15.	Blue tit	*Parus caeruleus*
16.	Green woodpecker	*Picus viridis*
17.	Stonechat	*Saxicola torquata*
18.	Woodcock	*Scolopax rusticola*
19.	Nuthatch	*Sitta europaea*
20.	Ruddy shelduck	*Tadorna ferruginea*
21.	Blackbird	*Turdus merula*
22.	Song thrush	*Turdus philomelos*
23.	Mistle thrush	*Turdus viscivorus*

The following large and medium-sized mammals were detected by footprints, scat or other marks: Wolf (*Canis lupus)*, Brown bear (*Ursus arctos)*, Fox (*Vulpes vulpes)*, Hare (*Lepus europeaus*), Badger (*Meles meles)*, Marten (*Martes* sp.). Estimated densities of these species are shown in Table III-6. The presence of Wild cat (*Felis silvestris)*, Lynx (*Felis (Lynx) lynx)*, Roe deer (*Capreolus capreolus)* and Wild boar (*Sus scrofa*) was also detected. However, the data obtained during this survey are not sufficient to estimate their densities.

Table III-6 Estimated densities of selected mammal species, Tetri Tskaro

Species	Density per 10 km^2
Brown bear	0.4
Wolf	3
Fox	33
Marten	26
Badger	18

4.3 CONCLUSIONS

The survey results clearly demonstrate that the site comprises an important wildlife habitat. Apart from bear, the densities of all species appear to be normal for such habitats. Woodlands of such productivity could in theory support more bears. It should be mentioned that animal densities in this particular area are likely to change according to seasons and this could also apply to bears. Unfortunately, it was impossible to obtain direct evidence of the area being used as a migration corridor by large mammals (this would require much more time and effort). However, because the site serves as a bridge between larger forest massifs, it is likely to also act as a migration corridor including that for altitudinal migration.

In general, the forest is surprisingly well-preserved and overall disturbance is low considering its proximity to human settlements.

Unfortunately, both Phase I and II surveys failed to provide any data to evaluate significance of the lake Cherepanovskoe as a wildlife habitat.

5 TSALKA RESERVOIR AND LAKE ALIGEL

5.1 INTRODUCTION

Phase II faunal surveys were undertaken by a team of NACRES zoologists (G. Darchiashvili, J. Natradze) in late March - mid April 201.

The study area comprises Tsalka Reservoir and Lake Aligel. Tsalka Reservoir is located at the altitude of about 1,500 m. The total surface area of the reservoir is approximately 30 km^2 at its maximum. Lake Aligel is a small, apparently seasonal lake located half-way between the reservoir and village Santa (refer to Figure III-20).

A method of point counts was applied during the survey. The site was surveyed twice to collect as much information as possible on migratory water birds, which tend to arrive at different times. The surveys covered entire lake and its shores to obtain an overall picture of the habitat and its importance for water birds.

All bird species present on the reservoir and its shores were identified and recorded with the aid of a scope. Information was collected to assess habitat status in terms of suitability for migratory water birds and overall disturbance.

5.2 SURVEY RESULTS

5.2.1 Study area as wildlife habitat

The shores of Tsalka Reservoir have practically no vegetation. Hence there are no suitable nesting sites, except for volcanic rock formations and large rocks on the southern shores where Ruddy shelducks (*Tadorna ferruginea*) may nest. Therefore, the reservoir has a limited importance as a nesting habitat for waterfowl. The reservoir is, however, significant for migratory birds and as a feeding ground for water birds that breed elsewhere.

In March the water level was very low and the lake was divided into several parts surrounded by mudflats where various waders were feeding. Several species including critically endangered GRDB species - black stork were also observed to feed on mudflats during the Summer Phase I surveys.

Figure III-5 Tsalka reservoir

Lake Aligel was dry at the time of the Phase II survey. This lake was also dry during the Phase I study in Summer 2000. This could be accounted for by severe droughts in recent years. Therefore, it has currently no importance as a water bird habitat.

5.2.2 Species

In total, twenty-eight bird species were recorded on Tsalka Reservoir (Table III-7). Many of them are internationally protected by Afro-Eurasian Migratory Waterbird Agreement (AEWA), including the threatened Georgian Red Data Book species - critically endangered Black stork (*Ciconia nigra*) and endangered Great white heron (*Egretta alba*). Black storks were present in small numbers (4-5 individuals), while great white herons were in large numbers (180). White storks nest in the adjacent areas and feed on the Reservoir. Charadriiformes species were abundant on mudflats. It should be noted that 3 Grey herons (*Ardea cinerea*), 6 Black storks (*Ciconia nigra*) and a few Marsh harriers (*Circus aeruginosu*) were present at Tsalka reservoir during the Phase I surveys in 2000. These species breed in adjacent areas and feed at the Reservoir.

Table III-7 Bird species recorded, Tsalka reservoir

#	Species		Migratory	Breeding in Georgia	Protected species
	Scientific name	Common name			
1	*Actitis hypoleucos*	Common sandpiper		+	
2	*Anas Penelope*	Wigeon	+	+	AEWA
3	*Anas platyrhynchos*	Mallard	+	+	AEWA
4	*Anas clypeata*	Shoveler	+		AEWA
5	*Ardea cinerea*	Grey heron		+	
6	*Aythya ferina*	Pochard	+	+	AEWA
7	*Aythya fuligula*	Tufted duck	+	+	AEWA
8	*Buteo buteo*	Common buzzard	+	+	
9	*Buteo lagopus*	Rough-legged buzzard	+		
10	*Carduelis cannabina*	Linnet		+	
11	*Charadrius dubius*	Little ringed plover		+	AEWA
12	*Ciconia nigra*	Black stork	+	+	AEWA, GRDB
13	*Corvus corax*	Raven		+	
14	*Corvus corone*	Hooded crow		+	
15	*Corvus monedula*	Jackdaw		+	
16	*Egretta alba*	Great white egret		+	AEWA, GRDB
17	*Fulica atra*	Coot	+	+	AEWA
18	*Larus cachinnans*	Yellow-legged gull		+	
19	*Larus ridibundus*	Black-headed gull		+	
20	*Larus ychthyaetus*	Great black-headed gull	?	?	AEWA
21	*Motacilla alba*	White wagtail		+	
22	*Phalacrocorax carbo*	Cormorant	+	+	AEWA
23	*Philomachus pugnax*	Ruff	+		
24	*Platalea leucorodia*	Spoonbill	+		AEWA
25	*Podiceps cristatus*	Crested grebe	+	+	AEWA
26	*Sturnus vulgaris*	Starling		+	
27	*Tadorna ferruginea*	Ruddy shelduck		+	AEWA
28	*Tadorna tadorna*	Shelduck	+	+	AEWA

Highest numbers of birds were observed in April, when the migration season was apparently at its peak. Estimated numbers of selected species are given in Table III-8. Data collected on other species unfortunately do not lend themselves to statistical analysis.

Figure III-6 Estimated number of bird species during migration, Tsalka reservoir

Common Name	Scientific Name	March	April
Common sandpiper	*Actitis hypoleucos*	-	20
Wigeon	*Anas penelope*	60	-
Mallard	*Anas platyrhynchos*	100	190
Shoveler	*Anas clypeata*	100	-
Grey heron	*Ardea cinerea*	30	270
Tufted duck	*Aythya fuligula*	-	240
Little ringed plover	*Charadrius dubius*	-	160
Great white egret	*Egretta alba*	-	180
Yellow-legged gull	*Larus cachinnans*	-	60
Black-headed gull	*Larus ridibundus*	25	2000
Great black-headed gull	*Larus ychthyaetus*	-	160
Cormorant	*Phalarocorax carbo*	35	-
Ruff	*Philomachus pugnax*	-	2400
Spoonbill	*Platalea leucoridia*	50	-
Great crested grebe	*Podiceps cristatus*	70	2300
Ruddy shelduck	*Tadorna ferruginea*	30	100
Shelduck	*Tadorna tadorna*	-	160

Figure III-7 Black stork, Tsalka reservoir (summer 2000)

5.3 CONCLUSIONS

As mentioned above, Tsalka Reservoir is mainly important for migratory water birds. Large numbers of various birds arrive during migration season. Highest numbers of birds were observed in April. However, mudflats in the easternmost part provide feeding grounds for a number of water birds (including the Georgian Red Data Book species - Black stork) not only during migration, but also in summer.

As regards the small lake Aligel, conservation value of this seasonal wetland is impossible to assess, as it was completely dry during both Phase I and Phase II surveys. It is however clear that it has no significance at present.

6 MOUNTAIN TAVKVETILI, NARIANIS VELI AND KTSIA WETLANDS

6.1 INTRODUCTION

The Phase II faunal surveys were carried out by a team of NACRES zoologists twice, in May and October 2001. The spring survey team was comprised of G. Darchiashvili and B. Lortkipanidze. The autumn survey team included I. Shavgulidze, G. Darchiashvili and Z. Javakhishvili.

The study area is shown on Figure III-21. Narianis Veli comprises part of the Ktsia river valley. It is located north of Lake Tabatskuri, at the altitude of about 2,050m. Among surrounding mountains Tavkvetili is the highest (2,582 m). The valley used to be covered with marshes in the past, most of which have been drained due to the construction of a network of canals. At present only small fragments of these marshes survive. The majority becomes dry in summer.

The sub-alpine meadows are located east of Narianis Veli and include the northern slopes of mountain Tavkvetili. The altitudes range within 2,580 - 2,300 m. During autumn survey a small section of the northern-eastern part of Lake Tabatskuri was also studied to obtain a wider picture of current bird migration.

During spring surveys five transects were completed, covering a total length of 35 km. One field data collection form was completed on each transect. Field data were analysed using the computer program Distance 3.5 to determine the densities of selected species. In addition, visual observations were conducted using a scope. A special Habitat Assessment Form was used to assess habitat status in terms of suitability for migratory water birds and overall disturbance.

Details of the autumn survey methods are given in Section 2.

6.2 SURVEY RESULTS

6.2.1 Study area as wildlife habitat

Narianis Veli must have been an extensive area of highland marshes before modification by drainage. Due to construction of a network of canals, most part of the wetland has disappeared. In addition, roads have been built. At present major forms of human disturbance include livestock (both sheep and cattle) grazing, mowing, hunting and fishing. Livestock grazing starts in late May and lasts until midsummer. Signs of erosion are evident on the surrounding hills. The mowing season starts in August and continues for 2-3 weeks. Fowling takes place during bird migration seasons and apparently represents one of the most important limiting factors for the wildlife.

During the autumn surveys some late migrants were still present. However, it was clear that the migration season was ending. Therefore, this survey failed to fully determine the importance of the site for autumn migrants including water birds and raptors. It may be true, however, that the wetlands are generally dry in autumn since all water is effectively discharged through the system of channels dug throughout the area. Therefore, Narianis Veli may have less significance for migratory waterfowl in autumn as opposed to the spring migration. Nevertheless the presence of the IUCN Red List species, Great snipe and some mallards indicate that the area

may still be quite important. Species diversity was higher on Tabatskuri Lake, which is another indication that autumn migrants may find Narianis Veli unsuitable owing to lack of water.

Figure III-8 Narianis Veli and Ktsia wetlands

The wetlands in the vicinity of the proposed Ktsia river crossing largely resemble Narianis Veli. However, human impact is even higher on this site, because it is closer to the village and human and livestock presence is more obtrusive.

Unlike Nariani, the sub-alpine meadows in the vicinity of mountain Tavkvetili represent a totally intact natural area with large patches of rhododendron scrub (*Rhododendron caucasicum*), which comprise habitats of the Caucasian Black Grouse, an endemic species included in GRDB. No roads are present. The only potential human disturbance is black grouse hunting.

The autumn survey findings at the mountain Tavkvetili area indicate that Caucasian black grouse are present all year round. The frequency of sightings in autumn was higher (two individuals were recorded on each day) than during the spring survey, which may be accounted for either by seasonal redistribution of the birds' density within the area or it was simply by chance that fewer birds were recorded in spring. Regardless of absolute density of this species, it is apparent that black grouse are present on Tavkvetili slopes throughout the year, ie it is a resident population and their presence cannot be attributed to random vagrancy. Black grouse have been previously recorded only on the Great Caucasus and Lesser Caucasus in two isolated populations. Considering this and the fact that this species is bound to rhododendron scrub, it is possible that the Tavkvetili population is an important intermediary linkage between the two larger populations. Therefore, the site is likely to serve as a critical 'stepping stone' linking the Greater Caucasus and Lesser Caucasus black grouse habitats. If this is the case, interruption of this link will threaten primarily the Lesser Caucasus black grouse population increasing the degree of its isolation.

In addition, grey partridge was also recorded on the slopes of mountain Tavkvetili. This is rather surprising as no available literature indicates the presence of this species at such high altitudes. Because this area is hardly ever disturbed, it is possible that it is an important refuge site for this rare species. In this case this site should be considered to support a core sub-population, which is very important for the maintenance of the whole population in the area.

Figure III-9 View of Mt. Tavkvetili

6.2.2 Species

Narianis Veli

The following mammal species were recorded during the spring survey: Weasel (*Mustela nivalis*), Fox (*Vulpes vulpes*), Brown bear (*Ursus arctos*) (proposed conservation status: Endangered), Badger (*Meles meles*) and Wolf (*Canis lupus*) (proposed conservation status: Low Risk). It appears that bears are attracted by new grass on Narianis Veli in spring. Foxes are especially abundant.

Wolves were present in minimum numbers during the spring survey. Like bears, they also come down to Nariani for food and at night take refuge in the forests to the north. The presence of wolves was also observed during the Phase I surveys. It is likely that wolf density increases in summer, especially during livestock grazing. Although the area around Narianis Veli would appear suitable for both otters (*Lutra lutra*) and marbled polecats (both of which are critically endangered Red Data Book species), neither were identified. The rarity of these species in Georgia may account for this.

Figure III-10 Fox at Narianis Veli

In total, twenty-nine (29) bird species were recorded at Nariani during the spring survey. A list of bird species observed during the fieldwork is included in Table III-8. Mallard (*Anas platyrhynchos*) and Shoveler (*Anas clypeata*) were most numerous. Obtained results allow estimation of numbers of some of the species recorded during the survey (Table III-9). Unfortunately, for other species data do not allow statistical analysis.

Important bird species observed during the spring survey at Narianis Veli include: Georgian Red Data Book species - Grey partridge (*Perdix perdix*) (also IUCN listed), populations of which are in decline throughout the country; Another Georgian Red Data Book species - Common crane (*Grus grus*); and Corncrake (*Crex crex*), which is included in the IUCN Red List as globally threatened species. In addition, all of the migratory waterfowl recorded on the site are protected by AEWA (Afro-Eurasian Waterbird Agreement) of the Bonn Convention. It should be noted that breeding common cranes (Critically Endangered according to GRDB) were also recorded during the Phase I surveys in Summer, 2000.

Figure III-11 Grey partridge

Table III-8 Bird species recorded at Narianis Veli in spring

No.	Species (recorded in spring)		Migratory	Breeding in Georgia*	Protected species
	Scientific name	Common name			
1	*Anas platyrhynchos*	Mallard	+	+	AEWA
2	*Actitis hypoleucos*	Common sandpiper		+	
3	*Alauda arvensis*	Skylark		+	
4	*Anas clypeata*	Shoveler	+		AEWA
5	*Anas querquedula*	Garganey	+		AEWA
6	*Aquila pomarina*	Lesser spotted eagle	+		
7	*Ardea cinerea*	Grey heron		+	
8	*Buteo buteo*	Common buzzard	+	+	
9	*Buteo rufinus*	Long-legged buzzard	+	+	
10	*Carduelis cannabina*	Linnet		+	
11	*Carduelis flavirostris*	Twite		+	
12	*Circus aeruginosus*	Marsh harrier	+	+	
13	*Corvus corax*	Raven		+	
14	*Corvus corone*	Hooded crow		+	
15	*Crex crex*	Corncrake	+	+	IUCN (VU)
16	*Gallinago gallinago*	Common snipe	+	+	AEWA

* These species are known to breed in Georgia. However it was impossible to check whether they breed specifically on the study area since the survey was done during the non-breeding season

No.	Species (recorded in spring)		Migratory	Breeding in Georgia*	Protected species
	Scientific name	Common name			
17	*Grus grus*	Common crane	+	+	AEWA, GRDB
18	*Hieraetus pennatus*	Booted eagle	+	+	
19	*Hirundo rustica*	Swallow	+	+	
20	*Motacilla citreola*	Citrine wagtail	+	+	
21	*Motacilla flava*	Yellow wagtail	+	+	
22	*Perdix perdix*	Grey partridge		+	IUCN (VU) GRDB
23	*Pica pica*	Magpie		+	
24	*Tadorna ferruginea*	Ruddy shelduck		+	AEWA
25	*Vanellus vanellus*	Lapwing		+	AEWA

Table III-9 Estimated densities of selected bird species, Nariani spring survey

Species	Numbers
Mallard	80
Ruddy shelduck	5
Grey heron	10
Marsh harrier	5
Shoveler	50
Garganey	30

Narianis Veli was almost dry during the autumn survey. Water remained only in deeper channels, where only few birds were recorded, including one IUCN Red List species, Great snipe (*Gallinago media*) and small flocks (10-20 individuals in each group) of Mallard (*Anas platyrhynchos*). Other species, noted single or several individuals, are: Snipe *(Gallinago gallinago)* Common buzzard (*Buteo buteo*), Long-legged buzzard (*Buteo rufinus*), Spotted eagle (*Aquila clanga*), Sparrowhawk (*Accipiter nisus*) Goshawk (*Accipiter gentilis*).

Northern Slopes of Mountain Tavkvetili

During the spring survey Caucasian black grouse (*Tetrao mlokosiewiczi*) was recorded in the sub-alpine meadows on the northern slopes of mountain Tavkvetili. This species is an endemic of the Caucasus that inhabits rhododendron scrubs and crooked-stem forests in sub-alpine areas. It is also included in the Georgian Red Data Book and IUCN Red List.

In addition to Caucasian black grouse, Grey partridge (*Perdix perdix*) was recorded during the autumn survey in the Tavkvetili area. It is also included in the Georgian Red Data Book and IUCN Red List.

Lake Tabatskuri

Eight species of water birds were recorded on lake Tabatskuri: Black-throated diver (*Gavia arctica)*, Black-necked grebe *(Podiceps nigricollis)*, Velvet scoter *(Melanitta fusca)*, Mallard *(Anas platyrhynchos)*, Gadwall *(Anas strepera)*, Shoveler *(Anas clypeata)*, Teal *(Anas crecca)*.

The black-throated diver (*Gavia arctica*) is noteworthy, as this species is very rare in Georgia. Each of these species was present in 3-4 individuals.

6.3 CONCLUSIONS

Narianis Veli and the Ktsia wetland to a lesser degree support a high diversity of migratory avian fauna. Among the birds species observed on the sites, many have international importance and are protected by AEWA, or are included in IUCN Red List or GRDB. In addition, the site is important for breeding birds. Common cranes have been observed to breed on the slopes (south) at Nariani and other birds may also be breeding there.

The site is also important as feeding grounds for large mammals, including brown bears.

The sub-alpine meadows are totally intact natural habitats with endemic rhododendron supporting endemic black grouse and another GRDB species – Grey Partidge. Therefore, it has high conservation value.

7 TSKHRATSKARO - TISELI AREA

7.1 INTRODUCTION

The Phase II faunal survey was carried out in two rounds by a team of NACRES zoologists (I. Macharashvili, I. Shavgulidze, L. Babuadze, G. Darchiashvili, B. Lortkipanidze and J. Natradze) in May 2001.

The study area covers high mountain forests and sub-alpine areas (Figure III-22). A total length of the pipeline route crossing the area is about 30 km. A number of forest types are present, including beech, beech and pine, fir and pine, mixed forests as well as pure fir forest. There are a number of lakes, with the lake Kakhisi being the largest. Highest points on the study area are mountain Kodiana, 2,688 m, and Tskhratskaro Pass at the altitude of 2,454 m.

Ten transects were completed, covering a total length of 90 km. One field data collection form was completed on each transect. Field data were analysed using the computer program Distance 3.5 to determine the densities of selected species. Habitat assessment forms were completed at 2-km intervals. In addition, bird species were identified and recorded.

7.2 SURVEY RESULTS

7.2.1 Study area as wildlife habitat

The study area is part of an extensive forest massif with sub-alpine areas. Most of the forests are mature communities, which are important refuges for many animal species. Human impact is extremely high due to tree felling on some of the sites, especially where terrain is accessible. However, natural regeneration appears to be high. The whole area abounds in streams, rivers and small ponds, which are important for amphibians. The terrain is quite rugged with frequent steep slopes and deep gorges. Mature old forests provide shelter for large mammals, such as bear, wolf, lynx, etc. Occasional openings and meadows, as well as forest type and structure and terrain diversity, create a mosaic of microhabitats. Forests are remarkably rich in wild fruits, various nuts and berries throughout the study area.

Figure III-12 Beech forest, Tskhratskaro-Tiseli

Figure III-13 Mixed forest, Tskhratskaro-Tiseli

Forestry operation is a major human factor in the area, which causes severe disturbance and habitat destruction. Hunting, including poaching, is another important negative factor. According to locals, chamois have become extremely rare due to illegal hunting. Cattle breeding is well-developed in the region. Alpine and sub-alpine meadows are used for livestock grazing. Erosion is evident in some places, which is apparently caused by grazing.

Figure III-14 Meadows contribute to heterogeneity of the habitat

Being the westernmost part of the Trialeti range, the study area is likely to comprise part of extensive migration routes for large mammals, through which gene exchange may take place between populations. However, neither this survey nor available information allows identification of specific biological corridors.

7.2.2 Species

The following large and medium-sized mammals were recorded by footprints, scat or other marks: Wolf (*Canis lupus)*, Brown bear (*Ursus arctos)*, Fox (*Vulpes vulpes)*, Hare (*Lepus europeaus)*, Marten (*Martes sp*.). Estimated densities of these species are given in Table III-10 below. The presence of Wild cat (*Felis silvestris)*, Lynx (*Felis (Lynx) lynx)* and Roe deer (*Capreolus capreolus)* was also detected. However, the data obtained during this survey are not sufficient to estimate their densities. Lynx is generally extremely rare and very secretive. Wild boars (*Sus scrofa*) are very rare in the study area. According to locals, they mainly occur in autumn, apparently moving from the adjacent areas for food, which must be abundant in these forests.

Table III-10 Estimated densities of selected mammal species

Species	Density per 10 km^2
Brown bear	1.2
Wolf	5
Fox	41
Marten	32

Taking into account current levels of disturbance and damage to the habitats, the above results of species densities should be regarded as normal. However, there could be some underestimation due to bad weather - heavy rains complicated animal census, the more so that counts of large mammals mainly rely on the detection by foot print and scat. While rains washed out tracks, scat identification was sometimes impossible. In addition, species

abundances are likely to vary according to season. For example, bear density as well as that of wild boar and wolf may increase in autumn when these animals may be attracted by abundant food, both plant food and prey.

In total, twenty-six bird species were recorded in the study area including Corncrake (*Crex crex*), a globally threatened species and black grouse (*Tetrao mlokosiewiczi*) - endemic of the Caucasus. A list of bird species observed during the fieldwork is given in Table III-11.

Figure III-15 Subalpine Rhododendron shrubbery, Black grouse habitat

Table III-11 Birds species recorded, Tskhratskaro-Tiseli

No.	Common Name	Scientific Name
1.	Skylark	*Alauda arvensis*
2.	Buzzard	*Buteo buteo*
3.	Rough-legged buzzard	*Buteo lagopus*
4.	Greenfinch	*Carduelis chloris*
5.	Treecreeper	*Certhia sp.*
6.	Wood pigeon	*Columba palumbus*
7.	Raven	*Corvus corax*
8.	Hooded crow	*Corvus corone*
9.	Corncrake	*Crex Crex*
10.	Great spotted woodpecker	*Dendrocopos major*
11.	Rock bunting	*Emberiza cia*
12.	Chaffinch	*Fringilla coelebs*
13.	Jay	*Garrulus glandarius*
14.	Coal tit	*Parus ater*
15.	Great tit	*Parus major*
16.	Blue tit	*Parus caeruleus*
17.	Green woodpecker	*Picus viridis*
18.	Stonechat	*Saxicola torquata*
19.	Woodcock	*Scolopax rusticola*
20.	Nuthatch	*Sitta europaea*
21.	Ruddy shelduck	*Tadorna ferruginea*
22.	Black grouse	*Tetrao mlokosiewiczi*
23.	Blackbird	*Turdus merula*
24.	Song thrush	*Turdus philomelos*
25.	Mistle thrush	*Turdus viscivorus*

In addition, there are a number of important species that are present in this area but have not been recorded during the Phase II survey. These include:

- Endemic Caucasian salamander (*Mertensiella caucasica)*, which is included in the Georgian Red Data Book and IUCN Red List
- Banded newt (*Triturus vittatus)*, which is included in the Georgian Red Data Book
- Endemic toad (Bufo verrucossimus)
- Viper (*Vipera kaznakovi*) - endemic species of the Caucasus, which is included in the Georgian Red Data Book and IUCN Red List.

The invertebrate fauna includes some IUCN Red List species, such as *Cerambix cerdo, Rosalia alpina, Parnassius apollo* , as well as endemic species included in the USSR Red Data Book: *Parnassius nordmanni, Carabus caucasicus, Colias caucasica, Helix buchi.*

7.3 CONCLUSIONS

Despite human disturbance and habitat degradation evident in certain areas, the study area, on the whole, is of high conservation value for various groups of fauna ranging from large mammals to amphibians and invertebrates.

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8 RIPARIAN AREAS AT MTKVARI AND POTSKHOVI CROSSINGS

8.1 INTRODUCTION

The Phase II faunal survey was carried out by a team of NACRES zoologists (J. Natradze and G. Darchiashvili) in late April 2001.

The study area is comprised of two sites at proposed Mtkvari and Potskhovi river crossings with a total area of 5 km^2 (Figure III-23).

Two transects were completed, covering a total length of 5 km. One field data collection form was completed on each transect. A special Habitat Assessment Form was used to assess habitat status in terms of suitability for migratory and breeding birds and overall disturbance.

8.2 SURVEY RESULTS

8.2.1 Study area as wildlife habitat

Riparian areas in the vicinity of the proposed Mtkvari crossing are heavily modified due to agricultural activities. The river bed is wide (about 30-40 m) at the proposed crossing location. Sparse shrubbery is developing on the left bank, while the right bank is hilly and intensively used for livestock grazing.

Figure III-16 Vicinity of proposed Mtkvari crossing

Like the areas in the vicinity of the proposed Mtkvari crossing, areas in the vicinity of the proposed Potskhovi crossing have also been heavily impacted by human activities. In the past, the entire area was apparently covered by riparian forests, which now survive only in small fragments or single trees. Most flat areas near the water are by now transformed into orchards, while adjacent slopes are used for livestock grazing.

Figure III-17 Vicinity of the proposed Potskhovi crossing

8.2.2 Species

In total, ten bird species were recorded in the vicinity of Mtkvari crossing. All of them breed in Georgia except for Garganey (*Anas querquedula*). Only two of them (Garganey and Little-ringed plover) are internationally important migratory water birds protected by AEWA.

A list of bird species observed during the fieldwork is given in Table III-12. Data obtained in the course of the survey do not lend to statistical analysis. However, two species, Garganey (*Anas querquedula*) and yellow-legged gulls (*Larus cachinnans*) appear to be most abundant. According to rough estimates, thirty (30) garganeys and seventy (70) yellow-legged gulls were present on the site.

Table III-12 Bird species recorded in the vicinity of Mtkvari crossing

No.	Species	
	Scientific name	English name
1	*Alcedo atthis*	Kingfisher
2	*Anas querquedula*	Garganey
3	*Ardea cinerea*	Grey heron
4	*Buteo buteo*	Common buzzard
5	*Carduelis cannabina*	Linnet
6	*Charadrius dubius*	Little-ringed plover
7	*Circaetus gallicus*	Short-toed eagle
8	*Larus cachinnans*	Yellow-legged gull
9	*Motacilla alba*	White wagtail
10	*Passer montanus*	Tree sparrow

In total, twenty-seven species of birds were recorded in the vicinity of Potskhovi crossing (refer to Table III-13 below). All these species breed in Georgia. Only two of them (Little-ringed plover and Green sandpiper) are internationally significant species covered by AEWA, while most of them are species that are typical for the countryside and agricultural lands. The data collected do not allow statistical analysis to determine species densities. However, it is clear that each of these species is present at numbers that are typical for such habitats.

Table III-13 Bird species recorded in the vicinity of Potskhovi crossing

No.	Species	
	Scientific name	English name
1	*Accipiter gentiles*	Goshawk
2	*Accipiter nisus*	Sparrowhawk
3	*Anthus trivialis*	Tree pipit
4	*Apus apus*	Swift
5	*Buteo buteo*	Common buzzard
6	*Carduelis cannabina*	Linnet
7	*Carduelis carduelis*	Goldfinch
8	*Carduelis chloris*	Greenfinch
9	*Charadrius dubius*	Little-ringed plover
10	*Cinclus cinclus*	Dipper
11	*Corvus corone*	Hooded crow
12	*Dendrocopos major*	Great spotted woodpecker
13	*Garrulus glandarius*	Jay
14	*Hieraeetus pennatus*	Booted eagle
15	*Hirundo rustica*	Swallow
16	*Jinx torquilla*	Wryneck
17	*Motacilla alba*	White wagtail
18	*Motacilla cinerea*	Grey wagtail
19	*Neophron percnopterus*	Egyptian vulture
20	*Oenanthe oenanthe*	Wheatear
21	*Parus major*	Great tit
22	*Passer montanus*	Tree sparrow
23	*Pica pica*	Magpie
24	*Saxicola torquata*	Stonechat
25	*Tringa ochropus*	Green sandpiper
26	*Turdus merula*	Blackbird
27	*Upupa epops*	Hoopoe

The presence of bats was noted in abandoned buildings on the left bank. There was a raptor's (possibly *Buteo rufinus*) nest on a nearby clay cliff. The nest was not occupied at the survey time. As regards large and medium-sized mammals, only fox (*Vulpes vulpes*) was noted.

8.3 CONCLUSIONS

Both the Potskhovi north and the Mtkvari west crossing areas comprise modified landscapes. The Mtkvari site has minimum importance for birds and/or large and medium-sized mammals. The Potskhovi crossing, however, is quite rich in biodiversity, which is generally characteristic for agricultural lands. In addition to the species that are connected to the water, this site appears to be important for breeding birds.

APPENDIX 4 FORESTRY ASSESSMENT

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FORESTRY ASSESSMENT

1 EXECUTIVE SUMMARY

During the period September 1-13, the consultant conducted an assessment of forests and forest health on a portion of the proposed BTC oil/gas pipeline route across the Republic of Georgia to be constructed by British Petroleum (BP). Terms of Reference for this assessment were to:

- Independently verify the results of a timber inventory that will be undertaken by the Georgia State Department of Forestry and advise BP accordingly

- Assess forest vegetation and its current condition, with special reference to forest fuels, occurrence of damaging forest insects and pathogens in the proposed right of way (ROW) and areas immediately adjacent to the right of way. This assessment would examine each of the major vegetation types along the ROW and areas immediately adjacent to the ROW

- Based on the above, identify potential changes in forest health that could result from the pipeline construction such as:
  - Changes in levels of forest fuels and potential hazard of wildfire
  - Hazards associated with buildup of bark beetles and other insects due to timber harvesting operations associated with the proposed construction
  - Hazards associated with wounding trees due to construction
  - Possible changes in drainage patterns associated with the construction and its effects on the residual forest

- Recommend appropriate forest management actions designed to prevent or minimize the risk of damage to residual forests during the construction process

A preliminary assessment of forested areas was done from digital aerial photographs to identify forest vegetation type, percent crown cover and forest area. Figure IV-1-a to IV-1-g show the areas of forest preliminarily identified through interpretation of the aerial photographs. In addition, areas suspected of being damaged by forest insects and diseases were identified on the aerial photos for subsequent ground checking. Twelve forested areas were visited in the field and were characterized according to species composition, age and size class and general state of forest health. Because of time restrictions, remoteness of the country and poor road conditions, preference was given to ground assessment of the larger areas of forest. Following the field evaluation, forested areas not visited on the ground were re-examined on the aerial photos. A final estimate of forest area was made in collaboration with a representative from Geoforest Design, the company that will conduct a forest inventory of forested areas along the pipeline ROW, using a GIS. A rough estimate of tree volume in the affected sites was made based on the recalculated area, field observations of timber volumes and data on average/ha volume of forests in Georgia available from FAO (Food And Agriculture Organisation of the United Nations).

Descriptions of forested areas visited on the ground are provided in the text of this report. These areas are highly variable and consist of sections of mixed broadleaf forests dominated by oaks, mixed forests of beech and pine, pine plantations, pine-spruce forests and riparian forests at

river crossings. Some of these areas are highly productive and will yield both sawlogs and fuelwood. Other areas contain smaller diameter material that will only be suitable for poles of fuelwood.

Forested areas in the pipeline ROW presently have a low occurrence of damaging insects and diseases. Some bark beetle activity was observed in pine in two of the higher elevation forests. There is a high incidence of wood decay caused by fungi in the birch component of one forest area. Therefore all birch will be designated as fuelwood during the inventory.

Total area of forest within the ROW between Tetriskaro and the Turkish border is estimated to be 95.59ha. This includes 41.25ha of open forest (11-60% crown cover) and 54.34ha of closed forest (>60% crown cover). This area is estimated to contain some 10,870m^3 of tree volume.

The Georgia Forest Department requests that an area equivalent to the area of forest removed during pipeline construction be reforested. A major concern, however, is the selection of species for the reforestation. The reforestation should replace not only forest but also habitat for local flora and fauna. Therefore the reforestation should not be done exclusively with conifers (eg pines, spruces, etc), which is a traditional approach to reforestation practiced by foresters worldwide.

Forest health hazards associated with pipeline construction include increased levels of bark beetle activity in conifer forests, trees killed adjacent to the pipeline ROW due to root injury or deposits of landfill around root systems and increased tree mortality due to inundation if drainage systems are not restored to their previous flow patterns.

2 INTRODUCTION

During the period September 1-13 2002, the consultant conducted an assessment of forests and forest health on a proposed oil/gas pipeline route across the Republic of Georgia to be constructed by British Petroleum (BP). Terms of Reference for this assessment were to:

- Independently verify the results of a timber inventory that will be undertaken by the Georgia State Department of Forestry and advise BP accordingly

- Assess forest vegetation and its current condition, with special reference to forest fuels, occurrence of damaging forest insects and pathogens in the proposed right of way (ROW) and areas immediately adjacent to the right of way. This assessment would examine each of the major vegetation types along the ROW and areas immediately adjacent to the ROW

- Based on the above, identify potential changes in forest health that could result from the pipeline construction such as:
  - Changes in levels of forest fuels and potential hazard of wildfire
  - Hazards associated with buildup of bark beetles and other insects due to timber harvesting operations associated with the proposed construction
  - Hazards associated with wounding trees due to construction
  - Possible changes in drainage patterns associated with the construction and its effects on the residual forest

- Recommend appropriate forest management actions designed to prevent or minimize the risk of damage to residual forests during the construction process

The purpose of this report is to summarize the results of this assessment and to present alternative management actions designed to prevent or mitigate changes in forest health that might occur during the pipeline construction.

3 BACKGROUND INFORMATION

3.1 GEORGIA'S FOREST ESTATE

According to FAO (FAO 2001), Georgia has a land area of 6,831,000 hectares, of which 2,988,000 hectares (43.7%) are forested. Virtually all forest land is government owned. Average wood volume is given as 145 meters^3/hectare and 97 tonnes of woody biomass/hectare. Average wood volumes for neighbouring countries and the United States are presented for comparison (Table 1).

Table 1 Average wood volumes for Georgia in comparison with neighbouring countries and the United States (Source: FAO 2001)

Country	Average Wood Volume (meters^3/hectare)
Armenia	128
Azerbaijan	105
Bulgaria	130
Georgia	**145**
Romania	213
Turkey	136
USA	136

The forests of the Caucasus Region, including Georgia, are located at a biogeographical crossroads where the flora and fauna of several biogeographic provinces converge – Central/Northern Europe, Central Asia, the Mediterranean Region and the Near East/North Africa. Climate is temperate but fluctuates by elevation and by regions. As a result, the flora and fauna of this region is especially rich and diverse. Moreover, the region contains a number of endemic species, some of which have limited natural ranges that could be adversely affected by human development.

3.2 FORESTED AREAS ALONG PIPELINE ROW

Forest cover occurs in several areas of pipeline ROW from the city of Tetriskaro west to the Turkish frontier. Preliminary estimates indicate that a gross area of 12.5km of the 44-metre wide pipeline ROW contains forest cover or a total forest area of 55ha.

3.3 PROPOSED INVENTORY, HARVESTING AND REFORESTATION ACTIONS

The Georgia Forest Department proposes to conduct an inventory of the forested areas within the pipeline ROW and sell the trees to BP using a countrywide valuation system based on tree species and size. The Georgia Forest Department is also requiring that an equivalent area be reforested.

3.4 HISTORIC FOREST HEALTH CONCERNS

Information provided by the Georgia Forest Department indicates that several bark beetles, defoliating insects and fungi have historically caused damage to the forests in the general vicinity of the proposed pipeline ROW.

3.4.1 Bark beetles

Bark beetles attack and breed in the inner bark of trees.

Figure IV-2 Egg and larval galleries of the spruce bark beetle, Ips typographus in the inner bark of spruce

Most species are secondary, confining their attacks to stressed, dying or freshly cut trees. However, some species are capable of attacking and killing relatively healthy trees and are major pest problems in conifer forests throughout the northern hemisphere. Five bark beetle species have historically caused damage in Georgian conifer forests:

- *Ips typographus* – This insect is considered Europe's most destructive bark beetle. It attacks various species of spruces, Picea spp., and has been reported as a commonly occurring bark beetle in western Georgia. Outbreaks often develop when windthrown trees or logs stored in the forest for prolonged periods become infested and subsequent

generations attack standing trees. Standing trees become more susceptible to attack during periods of below normal precipitation

- *Ips sexdentatus* – Closely related to *I. typographus* and with similar habits, it is capable of attacking both pine and spruces

- *Ips accuminatus* – This insect is smaller in size than the two previously discussed species and is capable of attacking and killing pines and spruces that have been weakened by drought. This bark beetle prefers to attack the upper, thinner barked portions of host trees, often killing only a portion of the upper crown

- *Dendroctonus micans* - Originally confined to Siberia, this insect has gradually spread westward across Eurasia as a result of human transport of infested logs. In the 1980s, it completed its westward spread when it became established in the British Isles. D. micans first appeared in western Georgia in 1960 and several outbreaks have occurred since that time. This insect attacks spruce and has been found in pine on rare occasions

3.4.2 Defoliating insects

Several species of caterpillars have been reported as pests of broadleaf forests and periodically reach outbreak levels in Georgia.

- *Lymantria dispar* – Known as the gypsy moth, this insect feeds on a large number of plants and has been known to cause widespread defoliation of oak forests in Georgia. This insect is known to be a major pest of broadleaf forests throughout Eurasian broadleaf forests and was introduced into North America in 1886, where it has also become a major forest pest

- *Operopthera bruceata* – This insect is known as the Bruce spanworm and feeds on a variety of broadleaf trees, occasionally reaching outbreak levels

- *Erranis defoliaria* – This insect has similar habits to the Bruce spanworm and also feeds on a wide range of broadleaf species. Its common name is the mottled umber moth

3.4.3 Fungi

Major disease problems are root, butt and heart rots caused by a variety of fungi. The primary effect of these agents is to reduce the merchantable volume of trees due to wood decay. Major wood decay fungi occurring in the area include:

Conifers:

- *Phellinus hartigi* in fir, *Abies nordmanniana*
- *Phellinus pini* in pine, *Pinus sp.*
- *Phellinus pini* var. *abietis* in spruce, *Picea orientalis.*

Broadleaf trees

- *Fomes fomentarius*
- *Phellinus ignarius*
- *Phellinus robustus*

- *Ganoderma applanatum*

3.4.4 Wildfire

Wildfire apparently is a minor concern over most of the forests that the pipeline intersects due to relatively high rainfall. This is especially true of the westernmost areas, which have a maritime climate due to the influence of the Black Sea.

4 ASSESSMENT METHODS

4.1 PRELIMINARY AERIAL PHOTO INTERPRETATION

Prior to the consultant's arrival in Georgia, a series of vertical, natural colour, digital aerial photographs of forested areas along the pipeline ROW were interpreted. These photos were acquired by BP during June 2001. Photos of pipeline ROW segments with forest cover (n=25) were numbered consecutively from east to west from 1-26 (There is no site 10). Aerial photos with relatively large areas of forest cover in the ROW were subdivided into smaller segments and designated by letter (a,b,c,d, etc). The 25 locations mentioned above are shown on Figure IV-18-a to IV-18-h at the end of this Appendix.

The photos were provided to the consultant in digital format on a CD and accompanied by topographic maps showing their location. Since the aerial photo coverage did not include overlap to provide for stereo viewing, they were interpreted by viewing them monoscopically on a computer screen.

The United Nations ECE/FAO definition of "forest" was used to establish which areas of ROW were forested (FAO 2001). Forest is defined as land with tree crown cover of more than 10% and an area of more than 0.5 hectares. Trees in forests should be capable of reaching a height of 5 meters at maturity.

Data taken from the aerial photos included:

- Vegetation type (eg broadleaf, conifer, mixed forest, plantation, riparian forest, etc)
- Percent crown cover (proportion of land area occupied by tree crowns) using a crown density scale
- Area of forest by crown cover class within the ROW determined by using a dot grid
- Occurrence of forest damage (eg tree mortality, foliage discoloration)

Data for each forest area were summarized by vegetation type and crown cover class. Crown cover classes were defined as follows:

- Non forest: = 10% crown cover
- Open forest: 11-60% crown cover
- Closed forest >60% crown cover

The final determination of forest area was done from the aerial photos in Tbilisi by the consultant in collaboration with a representative of Geoforest Design, the company that will conduct the inventory of forested areas in the pipeline ROW. Area determination was made using geographic information system (GIS) software.

4.2 GROUND OBSERVATIONS

All ground observations were made in collaboration with representatives of BP, the Georgia Forest Department and Geoforest Design. A total of 12 of the 25 sites identified on the aerial photos were examined on the ground (Table 1). Due to limitations imposed by time and access, preference was given to the larger forest areas.

Data collected in each forest area included:

- Species composition
- Average diameter breast height (dbh)
- Height
- Stand density – Basal area/ha.
- Occurrence of damaging or potentially damaging insects and diseases

Estimates of timber volume were made based on the consultant's knowledge of similar North American Forests and through discussions with the representatives of the Georgia Forest Department and Geoforest Design, who accompanied the consultant to all sites visited on the ground. Logical end products of the material to be harvested were also identified.

Since the forest inventory had not begun at the time of the consultant's visit, it was not possible to verify inventory results as stated in the mission terms of reference.

Table 2 Summary of forest areas examined on BTC pipeline ROW, Republic of Georgia

Sector	Aerial Photo Number	Ground Checked
Tetriskaro	1	No
	2	Yes
	3	No
	4	No
	5	Yes
	6	No
	7	No
	8	Yes
	9	Yes
Sakire East	11	Yes
	12	No
	13	No
	14	Yes
	15	Yes
	16	Yes
	17	Yes
Sakire West	18	No
	19	No
	20	No
	21	No
	22	No
	23	No
	24	Yes
	25	Yes
	26	Yes

4.3 REINTERPRETATION OF AERIAL PHOTOS AND FOREST AREA COMPUTATION

All areas not ground checked were re-interpreted on the aerial photos and the forest vegetation was classified based on information acquired during the ground observations. Final estimates of forest area were done using a BP GIS database in collaboration with a representative from Geoforest Design.

5 RESULTS

Descriptions of areas examined on the ground are reported by three sub-regions:

1. Tetriskaro, including the Tetriskaro forest and small outlying areas south of Tetriskaro (Eastern area, Aerial photos 1-9)

2. From west of the Tetriskaro Forest west to the village of Sakire (Central area, aerial photos 11-17)

3. From the village of Sakire west to the Turkish frontier (Western area, aerial photos 18-26)

Forest type and area are summarized for all areas in Tables 3-5.

5.1 EASTERN AREA

5.1.1 Photo 2

This is a small area of forest near the community of Jandara, where the ROW crosses the Algeti River. The dominant vegetation is poplar, both native and planted. A grove of Lombardy poplar, *Populus nigra* Italica, has been planted at the site a number of years ago and are the most abundant trees. They average about 25cm dbh and are about 20 metres tall. Other trees in the area include *Populus alba*, a hybrid poplar, willow and a few low salt cedars, *Tamarix ramusissima*.

Figure IV-3 Lombardy poplar planting, Algeti River crossing, aerial photo 2

5.1.2 Photo 5

The area of forest in photo 5 is located south of the community of Tetriskaro. Terrain is gentle to rolling with a few steeper hills. Elevation is 900 metres at the eastern edge of the forest, rising to 1,075 metres in the west. The area consists of several patches of closed forest interspersed with meadows and abandoned pastures that are gradually returning to forest.

The closed forest areas consist of poor quality Georgian oak, *Quercus iberica* and *Carpinus orientalis*. These are probably of coppice origin and of small diameter (7-10cm dbh). Estimated volume is 50-60m^3/hectare. The small tree diameter limits the harvest to fuelwood.

The areas of open forest are primarily abandoned agricultural lands that are gradually returning to forest cover, primarily with hornbeams, *Carpinus orientalis* and *C. caucasica*, *Crataegus* sp., and maples, *Acer laetum and A. campestre*. The open areas are also populated with large numbers of a thorny shrub, *Palinurus spina-christi*. In one area (Photo 5a), a plantation of ash, *Fraxinus excelsior*, has been established but has a low survival rate and some of the trees have poorly formed crowns and dead branches. The trees in the open areas are of sapling size and have no commercial value.

Figure IV-4 Abandoned pasture returning to mixed broadleaf forest, eastern edge of forest shown on aerial photo 5

5.1.3 Photo 8

The forest in photo 8 is located east of the village of Didi Iraga and consists of a mixed broadleaf forest dominated by Georgian oak, *Quercus iberica*, hornbeam, *Carpinus orientalis* and wild pear, *Pyrus caucasica*. This area is on gentle, rolling but rocky terrain at an elevation of ca 1,100 metres at the eastern end and gradually rising to 1,325 metres at the western extremity of the forest. A portion of this area (Photo 8 f-g) has a large number of *Eronymous latifolia* in the understory. This is a small woody plant that produces a colourful fruit. Understory tree regeneration is sparse in the closed forest areas.

This forest is of coppice origin and the largest trees are oaks (average dbh = 36 cm). Estimated volume is 80-90m^3/ha. The larger trees in this site are capable of producing sawlogs and the remaining trees can be harvested for fuelwood.

An aerial signature characteristic of dead trees was detected on the aerial photos in southeastern part of this forest (sectors a and b). Ground examinations indicated that the mortality involved several species: *Pyrus caucasica, Fraxinus excelsior* and *Carpinus orientalis*. The only biotic agent found associated with this condition was infestations of the parasitic mistletoe, *Viscum album* in *Pyrus caucasica.* Considerably less "tree mortality" was found on the ground than on the aerial photos. Since the aerial photos were taken in June 2001, it is possible that most of the "dead" tree crowns seen on the aerial photos were actually broadleaf species that were late in leafing out.

Figure IV-5 Left Oak dominated forest in aerial photo 8

Figure IV-6 Wild pear dying from a severe infestation of the mistletoe, *Viscum album*

5.1.4 Photo 9

The forest shown in photo 9 is located about 1km north of the forest in photo 8. Terrain is gentle and elevations range from ca 1,375 to 1,525 metres, soils are rocky.

This forest is also a mixed broadleaf forest dominated by Georgian oak, hornbeam and wild pear with lesser amounts of ash and maple. Of the three relatively large areas of mixed broadleaf forest in the Tetriskaro area, this forest is clearly the most productive. Some areas (eg section 9i) contain large oaks and hornbeams with dbh reaching 75cm. In other areas (section 9n) the trees are smaller with an average dbh of 35m. Volume is estimated to be 100-120m^3/ha.

The higher elevation portions of this forest contain a component of high mountain oak, *Quercus macranthera.* This oak is similar in appearance to the Georgian oak but is less common. The tree is listed in the Red Data Book of Georgia as a sensitive species.

Figure IV-7 Large diameter oak in forest area of aerial photo 9

In some areas, there is heavy regeneration of hornbeam in the understory. These trees are almost 2 metres tall, making some portions of this forest difficult to walk through. Regeneration of oaks is sparse.

This forest area is capable of producing sawlogs of good quality from the larger trees and fuelwood from the small diameter material.

A few instances of stem decay were found in the hornbeam component of this forest.

Table 3 Summary of forest characteristics Tetriskaro Area, BTC Pipeline, Republic of Georgia

Photo Number	Major Tree Species	Other Tree Species	Land Area (ha)			Estimated Volume (m^3/ha)*	Wood Products
			Open forest	Closed forest	Total		
1	*Willow*		*0.67*	*0.00*	*0.67*		*Unproductive*
2	Poplar	Willow Salt cedar	0.28	1.28	1.56	--	Fuelwood Sawlogs
2.1	*Mixed broadleaf forest*		*0.68*	*0.00*	*0.68*		
2.2	*Mixed broadleaf forest*		*0.19*	*0.07*	*0.27*		
3	*Mixed broadleaf forest*		*0.16*	*0.83*	*0.98*		*Fuelwood Sawlogs*

Photo Number	Major Tree Species	Other Tree Species	Land Area (ha)			Estimated Volume (m^3/ha)*	Wood Products
			Open forest	Closed forest	Total		
4	*Mixed broadleaf forest*		*0.05*	*0.19*	*0.24*		
5	Georgian oak *Hornbeam*	Ash Maple Willow	6.29	4.21	10.50	50-60	Fuelwood
6	*Poplar Willow*		*0.00*	*0.24*	*0.24*		*Fuelwood Sawlogs*
7	*Mixed broadleaf forest*		*1.30*	*1.18*	*2.48*		*Fuelwood Sawlogs*
8	Georgian oak Hornbeam Wild pear	Maple Ash	2.18	10.52	12.70	80-90	Fuelwood Sawlogs
9	Georgian oak Mountain oak Hornbeam Wild pear	Maple Ash	3.90	6.53	10.43	100-120	Fuelwood Sawlogs
Total (area)			15.69	25.06	40.75		

* Volume estimates apply only to closed forest areas; information provided in italics is based solely on aerial photo interpretation.

** Sites designated as 2.1 and 2.2. are additional forest areas detected when the aerial photos of the entire pipeline ROW were examined.

5.2 CENTRAL AREA

5.2.1 Photos 11 to 13

These areas are located west of the village of Avranlo, in a region that was totally deforested about 400 years ago during a Turkish invasion and resulted in extensive burning of the forest cover. The loss of tree cover created a drier climate in a region with an already continental climate and the forest never regenerated. During the 1950s, a large reforestation effort was initiated and a large number of *Pinus sylvestris* var. *hamata*[1] plantations were established. The forests shown on aerial photos 11-13 are part of these plantations.

The plantation on aerial photo 11 is located on gentle terrain at an elevation of ca 1,625m. It is about 20-25 years old, has an average dbh of 10cm and an average height of 8 metres. BA is an average of 20 metres^2/hectare. This plantation is relatively homogeneous except for a few open

[1] Known in Georgia as *Pinus hamata*. The convention used in this report is that of Farjon (1998) of the Royal Botanical Gardens, Kew, UK.

areas. The consultant estimates a volume of 80-90m^3, which is lower than that provided by the representatives of the Georgia Forest Department and Geoforest Design (100-120m^3/ha).

Because of the heavy ground cover and carpet of pine needles in the closed forest portions of this plantation, it is virtually devoid of understory vegetation.

Areas 12-13 could not be examined due to time limitations. Aerial photo interpretation indicates that they are virtually identical to photo 11, although photo 13 has a somewhat more open crown cover (Table 2).

Figure IV-8 Pine plantation on pipeline ROW near Avranlo on aerial photo 11

5.2.2 Photo 14

The "forest" on photo 14 consists of a small thicket of *krumholz* mountain ash, *Sorbus caucasigena* on a steep slope just below tree line near the Tskhratskaro (Nine Springs) Pass. The trees average 5cm in diameter and are about 2.5m in height. The grove is edged on its upper side with a prostrate stand of *Rhododendron caucasicum*, a species endemic to the Caucasus Region.

The pipeline ROW runs along the northern edge of this area and the construction may require removal of just a few trees

On the aerial photo, the tree crowns appeared to be thin and stressed. On the ground, however, this grove of mountain ash appeared to be in good condition. Considering that the aerial photos were acquired in June and the high elevation of the site, these trees were in the early stages of leafing out at the time of photo acquisition, which undoubtedly accounts for their stressed appearance.

Figure IV- 9 Crooked stemmed birch at high elevation zone of forest shown on aerial photo 14 with fruiting bodies (arrows) of the wood decay fungus *Ganoderma applanatum*. These indicate that most or all of the heartwood in this tree is decayed

5.2.3 Photo 15

The forest on photo 15 is located east of the village of Tsikisjvari on level terrain at an elevation of ca 1,600 metres.

This forest is a plantation of *Pinus sylvestris* var. *hamata* established in 1960. The plantation was originally established in rows with trees spaced 1 meter apart and has had at least one commercial thinning. Much of the forest is open with little or no vegetation (including tree regeneration) in the understory. In the riparian areas beech, *Fagus orientalis*, cherry, *Prunus avium*, and other broadleaf species have become established. In other areas, broadleaf species are established in the understory, giving the area an appearance of a natural forest. With the exception of a few hay meadows, the forest is homogenous and well stocked. Average dbh of the pines is 36cm, average height is about 14m and BA varies from 20 to 44m^2/ha. Average volume is estimated at 200 to 250m^3/ha.

This forest is used by local farmers for grazing of dairy cattle.

Overall health of this forest is good. No recent tree mortality was seen in the plantation, however a single large, open grown pine at the edge of the western end of the plantation had a recently killed upper crown, presumably due to attack by the bark beetle, *Ips accuminatus*.

Figure IV-10 Portion of pine plantation along pipeline ROW on aerial photo 15

Figure IV-11 *Pinus sylvestris* var. *hamata* with topkill believed to be caused by the bark beetle, *Ips accuminatus*

5.2.4 Photo 16

This area consists of a segment of forest that lies between the village of Tsikhisjvary on the east and the Kodiana Pass on the west. Elevations range between ca 1,700 and 2,000 metres. Terrain is moderately steep with elevations rising from east to west.

This forest is a mixed broadleaf-conifer forest dominated by pine, *Pinus sylvestris* var. *hamata* and beech, *Fagus orientalis.* As elevations increase, the proportion of beech decreases and is replaced by other broadleaf species such as maple, *Acer campestris*, and crooked stem birch, *Betula litwinowii*. Georgian oak, *Quercus iberica*, is present in small numbers throughout the area. Alder, *Alnus* sp. is the dominant species in the riparian areas at the eastern end of the forest.

At the lower elevations, both pine and beech are of large diameter (up to 50cm dbh) and of reasonably good quality. These areas have been cut over at least once and are relatively open (BA of 12 to 14m^2/ha). A volume estimate provided by the representative of Geoforest Design is 150m^3/ha, for the lower beech dominated areas of this forest is judged by the consultant to be a realistic estimate. At mid to higher elevations, there are a few small pine plantations. These are about 22-25 years old, overstocked and relatively slow growing. Mean dbh is about 15cm and height is approximately 10 metres. BA/ha is 30 metres^2.

The entire area is used by local residents for grazing of dairy cattle during the summer months. Consequently there is not a great deal natural tree regeneration in this area.

The pine forests, both within the ROW and in surrounding parts of the forest, have a scattering of recently killed trees, usually single trees or small groups of 2-5 trees. These are indicative of bark beetle attack. Examination of the thin barked portions of the lower boles failed to evidence of bark beetle infestations. However, a recently broken branch of a large pine contained an infestation of a species of *Ips*, believed to be *Ips accuminatus*, This is a small species that prefers the thin barked portions of the upper crowns of pines and is incapable of infesting thick barked portions of trees. Attacks in standing trees caused by this insect typically occur in the upper portion of the crown.

The larger birches in the upper elevation zones have a high occurrence of stem decay caused by several species of fungi including *Ganoderma applanatum.* The high incidence of heartrot in birch renders this species useless except as poor quality fuel wood. Some maples also showed external symptoms of decay and the high elevation beeches contained numerous frost cracks, which could result in loss of wood quality and can serve as sources of infection by decay fungi.

Figure IV-12 Beech forest typical of the lower elevation at the east side of the forest segment shown on aerial photo 16

5.2.5 Photo 17

This segment of forest begins just west of the Kodiana Pass and continues west to the village of Sakire. Elevations range from ca. 1,475 to 2,100 metres, descending from east to west. Slopes are moderately steep.

This area is virtually a pure conifer forest of *Pinus sylvestris* var. *hamata* and spruce, *Picea orientalis* with an occasional birch. At the highest elevations, the forest consists only of pine and as elevations decrease the proportion of spruce gradually increases.

This forest is interspersed with large alpine meadows, consequently the total area of forest cover (= 10% crown cover) is low (Table 3).

Some tree harvesting has recently occurred. In the easternmost portion of the forest, a large pine that had been recently cut contained an infestation of *Ips accuminatus* in the thinner barked portions of the crown. Moreover there are a number of spruce logs in the forest that have been recently cut but not removed. Examination of the underside of one of these logs indicated a heavy infestation of the spruce bark beetle, *Ips typographus.*

Figure IV-13 Pure pine forest near east end of forest section shown in aerial photo 17

Figure IV-14 Mixed pine-spruce forest near centre of forest segment shown in aerial photo 17. Pipeline ROW is approximately at centre of photo

5.3 WESTERN AREA

Forest areas west of the village of Sakire consist of several small areas of upland forest and riparian zone forests where the pipeline ROW crosses a river. Areas examined on the ground were on aerial photos 24, 25 and 26 where the proposed pipeline ROW crosses the Kura (24) and Potskhovy Rivers (25 and 26). Trees and woody plants in these areas consist of classic riparian species. Descriptions of other sites are based solely on aerial photo interpretation.

5.3.1 Photo 24

The only trees are a scattering of open grown poplars, *Populus nigra*, which are confined to segment 24b. These trees are large with an average height of about 8 metres. However the stems are crooked and of poor form. The aerial photo indicates that only 5 of these large poplars are in the proposed pipeline ROW. The remaining woody vegetation consists of low shrubs of the following species:

Black locust, *Robinia pseudoacacia*
Salt cedar, *Tamarix* sp.
Sea buckthorn, *Hipopphae rhamnoides*[2]
Maple, *Acer campestris.*

[2] Sea buckthorn is an endemic species and is listed in the Red Data Book of Georgia as being sensitive.

Figure IV- 15 Open poplar forest on pipeline ROW at the Kura River crossing, aerial photo 24

5.3.2 Photo 25

This area consists of a small grove of trees on the north side of the river (segment a) dominated by poplar, willow, *Salix* sp. and alder, *Alnus barbata*. The largest trees are poplars but they are multi-stemmed and of poor form. Vegetation on the south side of the Potskhovy River (segments b and c) consists of brush and fruit orchards. The only "forest" vegetation is in segment a.

Figure IV-16 Riparian forest and brush vegetation on pipeline ROW at the Potskhovy River crossing, aerial photo 25

5.3.3 Photo 26

Trees on photo 26 consist of a single row of small poplars, willows and alder in segment 26a and of a single row of small willows along a ditch in segment 26b. Most of the trees occurring in the ROW in this scene are saplings.

Table 4 Summary of forest characteristics Sakire East area, BTC Pipeline, Republic of Georgia

Photo Number	Major Tree Species	Other Tree Species	Land Area (ha)			Estimated Volume (m^3/ha)*	Wood Products
			Open forest	Closed forest	Total		
11	Pine	None	0.40	2.48	2.87	80	Poles Fuelwood
12	*Pine*	*None*	*0.17*	*0.30*	*0.47*	*80*	*Poles*
13	*Pine*	*None*	*0.30*	*0.39*	*0.69*	*80*	*Fuelwood*
14	Mountain ash	None	0.00	0.00	0.00	None	None
*14.1***	*Beech*		*0.00*	*0.09*	*0.09*		
14.2	*Beech*		*7.12*	*0.00*	*7.12*		
14.3	*Beech*		*0.97*	*0.00*	*0.97*		
15	Pine	Beech Alder Georgian oak	0.47	8.39	8.86	200-220	Sawlogs Fuelwood
15.1	Beech Pine		0.00	0.23	0.23		Sawlogs Fuelwood
15.2	*Beech Pine*		*0.00*	*0.10*	*0.10*		
15.3	*Beech Pine*		*0.00*	*0.00*	*0.65*		
16	Beech Pine	Georgian oak Maple Birch	7.61	6.70	14.31	120-150	Sawlogs Fuelwood
17	Pine Spruce	None	2.42	4.11	6.53		Sawlogs fuelwood
Total (area)			21.04	22.78	43.82		

* Volume estimates apply only to closed forest areas; information in italics is based solely on aerial photo interpretation.

** Areas designated as 14.1, 14.2, 15.1 are areas of additional forest detected when the aerial photos of the entire pipeline ROW were examined.

Table 5 Summary of forest characteristics Sakire West area, BTC pipeline, Republic of Georgia

Photo Number	Major Tree Species	Other Tree Species	Land Area (ha)			Estimated Volume*	Wood Products
			Open forest	Closed forest	Total		
18	*Conifer*		*0.34*	*0.31*	*0.65*		
19	*Poplar Willow*		*0.28*	*0.00*	*0.28*		
19.1	*Broadleaf*		*0.51*	*0.70*	*1.21*		
20	*Broadleaf*		*0.03*	*0.19*	*0.22*		
20.1	*Broadleaf*		*0.20*	*0.00*	*0.20*		
21	*Beech Pine*		*0.08*	*1.05*	*1.13*		
21.1	*Broadleaf*		*0.12*	*0.35*	*0.47*		
22	*Poplar Willow Beech*		*0.00*	*0.31*	*0.31*		
22.1	*Broadleaf*		*0.00*	*0.32*	*0.32*		
23	*Broadleaf*	*Conifer (23b)*	*0.21*	*1.28*	*1.49*		
23.1	*Broadleaf*		*0.00*	*0.48*	*0.48*		
24	Poplar	Black locust Tamarix	0.52	0.00	0.52		Sawlogs Fuelwood
24.1	*Broadleaf*		*0.00*	*0.24*	*0.24*		
24.2	*Broadleaf*		*0.00*	*0.17*	*0.17*		
24.3	*Conifer*		*0.00*	*0.25*	*0.25*		
24.4	*Broadleaf*		*0.00*	*0.12*	*0.12*		
24.5	*Broadleaf*		*0.00*	*0.11*	*0.11*		
24.6	*Broadleaf*		*0.04*	*0.00*	*0.04*		
24.7	*Broadleaf*		*0.02*	*0.00*	*0.02*		
24.8	*Broadleaf*		*0.02*	*0.00*	*0.02*		
24.9	*Broadleaf*		*0.16*	*0.00*	*0.16*		
25	Poplar	Willow Alder	0.25	0.11	0.36		Fuelwood
26	Poplar	Willow Alder	0.00	0.21	0.21		Sawlogs Fuelwood
26.1	*Broadleaf*		*0.58*	*0.00*	*0.58*		
26.2	*Broadleaf*		*0.00*	*0.02*	*0.02*		
26.3	*Broadleaf*		*0.00*	*0.06*	*0.06*		
26.4	*Broadleaf*		*0.97*	*0.00*	*0.97*		
26.5	*Broadleaf*		*0.22*	*0.14*	*0.36*		
Total			4.52	6.50	11.02		

* Volume estimates apply only to closed forest areas; information in italics is based solely on aerial photo interpretation.

6 ESTIMATE OF FOREST AREA AND TREE VOLUME IN ROW

A rough estimate of the tree volume in the ROW is based on:

- The area of open and closed forest in the ROW as estimated via GIS analysis
- Field observations and measurements by the consultant
- Average volume/ ha data available for Georgia from FAO (FAO 2001) – 145m^3/ha

6.1 FOREST AREA

Total forest area within the BTC pipeline ROW between Tblisi and the Turkish border is estimated to be 95.59ha, of which 41.25ha were classified as open forests and 54.34ha were classified as closed forests (Table 6). Another 1.26ha of "forest," mostly single row windbreak plantings, were detected on the ROW between the Azerbaijan border and Tbilisi.

6.2 TREE VOLUME

Field observations made by the consultant indicate that the average tree volume of 145m^3/ha would apply only to those areas of closed forest in the ROW. Open forests are assumed to contain an average of half of this volume or 72.5m^3/ha. Based on these values, a rough estimate of 10,870m^3 of tree volume occurs in the ROW (Table 6).

Table 6 Summary of forest area and estimated tree volume BTC pipeline ROW – Tbilisi to Turkish border

Sector	Open forests		Closed forests		Total	
	Area (ha)	Volume m^3/ha	Area (ha)	Volume m^3/ha	Area (ha)	Volume m^3/ha
Tetriskaro	15.69	1137.53	25.06	3633.70	40.75	4771.23
Sakire East	21.04	1525.40	22.78	3303.10	43.82	4828.50
Sakire West	4.52	327.70	6.50	942.50	11.02	1270.20
Total	41.25	2990.62	54.34	7879.30	95.59	10869.93

7 PROPOSED REFORESTATION PROGRAM

The Georgia Forest Department has requested that BP plant an area of forest plantations equivalent to the area of forest to be removed during pipeline construction.

In Georgia, forest plantations are established at a stocking level of 2,000 to 3,000 seedlings/hectare. This is done to ensure adequate seedling survival to establish a fully stocked forest and to encourage trees to develop good form and achieve good height growth. The pine plantation on aerial photo 15, for example, was established in 1960 with a stocking level of 2000 trees/hectare. Now at age 42, with a least one thinning, stocking level is about 300 trees/ha.

The planting program proposed by the Georgia Forest Department is a more or less standard procedure worldwide for establishing forest plantations.

A concern expressed by several people contacted during this mission is an appropriate selection of species for reforestation. Typically forest plantations in temperate zones are established with conifers (pine, spruce, etc). These trees are relatively easy to grow in nurseries and initial planting survival is usually high. Both *Pinus nigra* and *P. sylvestris* var. *hamata* plantations were seen during travels associated with this mission and in the Avranlo area, which was deforested several centuries ago, the only forests in existence are pure pine plantations established by the Georgia Forest Department.

While conifer plantations may be an efficient and reliable means of producing wood fiber, they do not provide suitable habitats for a wide variety of plant and animal species. These plantations are usually dense and the forest floor is under heavy shade unsuitable for establishment of understory plants or natural tree regeneration. Conifer plantations also do not provide suitable habitat for wildlife species. In recent years, this consultant has observed several situations where extensive planting of pines has had detrimental effects on wildlife. In Poland, for example, establishment of extensive *Pinus sylvestris*, plantations has reduced the area of suitable browse for deer populations. As a result, deer herds must receive supplemental feeding in order to keep populations at sufficiently high levels to satisfy hunters. In Brazil, extensive plantations of *Pinus taeda* and *Pinus elliotti* in the country's three southernmost states has displaced the habitat for capuchin monkeys, who rely on fruits and nuts produced by trees in mixed species natural forests. As a result, these monkeys have found that the bark in the upper crowns of pines is palatable and are stripping the bark from these trees for a food source. This is causing top kill of pines in extensive areas of pine plantations.

The lack of biodiversity associated with pure conifer forests also makes them susceptible to high levels of damage from insects and diseases. Several examples include repeated defoliation by the pine processionary caterpillar, *Thaumetopoea pityocampa* in either pure natural forests of *Pinus brutia* in the Mediterranean Region, periodic episodes of nun moth, *Lymantria monacha* and other pine defoliating insects in Poland and neighbouring countries and outbreaks of bark beetles and defoliating insects in the natural conifer forests of North America.

When planning reforestation programs to replace trees lost during pipeline construction, consideration should be given to replacing not only forest but also habitat for other plant and animal species. For example, oaks and other broadleaf trees could be established in the Tetritskaro area to replace lost forest in that area since native pines do not occur there in large numbers. While broadleaf species are more challenging to grow in nurseries and establish in the

field, they will more effectively provide the habitat required to ensure the survival of the large number of endemic species found in the Caucasus Region. However, it must be acknowledged that there is not significant experience worldwide of artificial reforestation of broadleaf forest habitats and therefore the proposed scheme should be considered as a pilot project.

8 POTENTIAL HAZARDS OF PIPELINE CONSTRUCTION TO FOREST HEALTH

8.1 BARK BEETLES

Several species of conifer infesting bark beetles use windthrow, recently cut logs and logging debris as breeding sites. This can result in increased numbers of insects, which are then capable of attacking standing trees, especially during periods of dry weather. Bark beetles of the genus *Ips*, of which at least three species are known to occur in Georgia, have this habit. Two of these, *Ips typographus* in spruce and *Ips accuminatus* in pine were found during the field observations. Moreover, an active infestation of either *Dendroconus micans* or *Ips typographus* was observed in spruce forests between Borjomi and Bakuriana during the course of the field observations. Therefore harvesting of conifer forests along the pipeline ROW could result in increased bark beetle activity.

Measures to mitigate the hazard of bark beetle population increase during logging include:

1. Rapid removal and processing of all commercial forest products
2. Peeling bark from logs that remain in the forest for more than 30 days
3. Lopping, scattering or burning of tops and branches of pines and spruce
4. Avoid stacking fuelwood or logs up against the stems of residual trees. Should the harvested material become infested with bark beetles, they will often attack the tree that this material has been stacked up against

Figure IV-17 Pine fuelwood stacked against a standing pine in forest area of aerial photo 17. Bark beetles emerging from the fuelwood can attack and kill the standing pine. Stacking of pine or spruce logs or fuelwood against residual trees should be avoided during pipeline construction

8.2 INJURY TO RESIDUAL TREES

Pipeline construction could result in injury to residual trees at the edge of the ROW. Complete girdling of the bark will result in tree mortality. Partial damage of the bark and resultant exposure of the wood could provide a site for entry of decay fungi.

Construction or logging damage to conifers (pine and spruce) will produce a resin flow that is attractive to bark beetles, therefore increasing the risk of bark beetle attack.

Injury to root systems during construction could result in branch dieback and some tree mortality of all tree species.

8.3 EXCESS FILL AROUND ROOT SYSTEMS

Placement of fill around root systems of trees along the edge of the ROW can result in tree dieback and mortality, especially in oaks. To the extent possible, this should be avoided.

8.4 CHANGES IN DRAINAGE PATTERNS

Altered drainage patterns during the construction process could result in water backing up into forested areas, inundating root systems and resulting in tree mortality along the edge of stream banks. This problem can be prevented by restoring creeks that flow across the pipeline ROW to their original flow patterns.

9 CONCLUSIONS AND RECOMMENDATIONS

9.1 CONCLUSIONS

The following conclusions of this mission are based on aerial photo interpretation, field observations and discussions with Georgian forestry officials

- Despite the relatively small area of forest cover along the pipeline ROW, the forests are highly variable and consist of riparian forests, broadleaf forests, mixed broadleaf-conifer forests, pine plantations and conifer forests. Forest condition and levels of productivity are also highly varied

- The most productive forest area is judged to be the 42-year old pine plantation on aerial photo 15. This area should have an average wood volume of 200-220m^3/ha. Other areas of relatively good productivity are portions of the beech-pine forest in photo 16 and the mixed broadleaf forest in photo 9

- The forested areas are in a relatively good state of health. A low level of bark beetle activity was detected in pines in the forest on photo 16 and in pine and spruce in photo 17 but is not considered serious. Birches in the forest on photo 16 have a high incidence of heart rot, which will render them useless for anything except low-grade fuelwood. Some mortality of broadleaf trees was observed in photo 8 but could not be attributed to a single cause

- Pipeline construction activity could result in changes in forest health including increased levels of bark beetle activity in conifer forests and increased tree mortality along the edges of the ROW due to construction activity and changes in drainage patterns

- Forest area along the ROW is estimated to be 95.59ha. A rough estimate of tree volume for the area is 10,870m^3

- The request by the Georgia Forest Department to reforest an equivalent area of forest to that which is removed due the pipeline construction is considered to be valid. However caution should be taken to select species for reforestation, where possible, which will not only replace trees lost during the construction but also habitat for plant and animal species

9.2 RECOMMENDATIONS

- Planning of reforestation programs, designed to replace forests lost during the pipeline construction should give consideration not only to replacing forest area but also to replacing habitat.

- During logging and pipeline construction, follow guidelines presented in section 7 to minimize loss of additional trees.

- Undertake periodic forest health monitoring at the edges of the ROW to verify the effectiveness of the habitat restoration techniques adopted and the general forest health in the vicinity of the ROW.

10 REFERENCES

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Appendix 1

Key People Contacted During Mission

British Petroleum (Employees, contractors and consultants)

Will Barrett, Environmental Scientist
Nika Laitadze, Permitting Coordinator
Bezhan Bezhanishvili, Security Officer
Girogi Chighvinidze, Team Emergency Physician
Zaali Kadjaia, Driver and translator
Ramaz Martsvaladze, Driver

Georgian International Oil Corporation

Kandelaki Awtandil

Georgia State Forestry Department

Chochua Lery, Senior Specialist

Geoforest Design

Otar Shengelia , Head of Group
Uri Shengalia

Saga Consulting Ltd

Antonio Santaniello

Dzelkva Ltd

David Kikodze, Executive Director (Botanist)
Nikoloz Kvaliashvili, Information Technology Specialist

Appendix 2

Glossary of Forestry Terms used in This Report

Basal Area: The area of land covered by tree stems, expressed as square metres/hectare or square feet/acre.

Coppice Forest: A forest regenerated from sprouts of cut trees as opposed to natural seeding or seedlings.

Crown Cover: The proportion of land area covered by tree crowns, expressed as a percent. The internationally accepted definition of "forest" is based on this measure and is currently established as areas of land with more than 10% crown cover.

Diameter breast height (dbh): Tree diameter measured at a distance of 4.5 feet (1.4 metres) above the root collar. This is a standard measure for estimating tree volume.

Endemic: A species of plant or animal whose natural range is restricted to a small area such as a single mountain range, drainage basin or political subdivision. Because of their restricted distribution, endemics are especially susceptible to extinction as a result of human development activities.

Forest: According to the most recent internationally accepted standard (FAO), a forest is an area where more than 10% of the land surface is covered by tree crowns and is at least 0.5ha in size. The trees should be capable of growing to a height of 5 metres.

Krumholz: A German word meaning "crooked wood." This term is applied to trees growing at high elevations, just below tree line, whose form is distorted by the effects of heavy snows, high winds and other severe site conditions. Krumholz trees may be several hundred years old but have only achieved a height of 1-2 metres**.**

Plantation: A forest established artificially either by planting young tree seedlings or seeding of tree seeds.

Sapling: A small tree, not of commercial size, with a dbh generally less than 10cm.

Thinning: A cultural procedure that involves intermediate cutting of some trees in a forest. Purpose is to reduce the level of tree stocking and to increase rate of growth of the remaining trees. Thinnings may be precommercial, where the trees are too small to be utilized, or commercial, where the cut trees are of a size that can be marketed. In intensively managed forests, two to three thinnings may be scheduled before final harvest.

Windthrow: Trees that are either uprooted or broken by high winds.

APPENDIX 6 OIL SPILL PREVENTION AND MITIGATIONS

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OIL SPILL PREVENTION AND MITIGATIONS

1 INTRODUCTION

Throughout the entire Environmental and Social Impact Assessment (ESIA) process, a great deal of importance has been placed on all issues related to potential oil spills. This is true in terms of both the internal focus of the BTC project team and the external focus from our stakeholders.

By far the greatest focus has been on route selection and designing a pipeline with high technical integrity such that oil spills are prevented. Section 5 of the ESIA outlines some of the design features associated with the pipeline while Section 10.5 of the ESIA describes the environmental risk assessment process (ERA). The ERA has been the key tool to assess the oil spill related residual risks associated with the BTC pipeline on a kilometre by kilometre basis. Appendix V, Annex E outlines the framework plan for oil spill response. This framework will be expanded over the coming year into a comprehensive oil spill response plan which requires approval by the Georgian Authorities prior to operation of the pipeline.

The purpose of this document is to provide a holistic description of the oil spill mitigation approach by:

1. Elaborating on design, and operational features which will prevent loss of containment
2. Elaborating on measures such as leak detection systems, valve placement and, pipeline operational response which will limit potential spill volumes in the unlikely event of loss of containment
3. Outlining the plans for oil spill response which will be developed between ESIA approval and BTC operation
4. Outlining the additional investigations and outcomes of oil spill prevention and mitigation studies which focus specifically on the Thratskaro to Kodiana section of the pipeline route

It should be noted that (ERA) has been the key tool used to assess the residual *environmental* risks associated with a loss in containment. While this report does draw on some of features of the ERA it is not intended to duplicate it. The ERA report has been provided to the Georgian government.

Finally, it should be noted that the ESIA is a "live" process which begins at concept selection and continues through to operations. The ESIA document outlines where the project is at the date of its submission. It is not possible, nor desirable, to close out all features related to the project at the stage of ESIA submission. This point is particularly pertinent to oil spill response planning but also to operational procedures which relate to issues such as pipeline surveillance and monitoring and pipeline shutdown. Frameworks and philosophies are in place for oil spill response and pipeline operations. However, the detail will be worked in the next phase of the project.

2 HISTORICAL CAUSES OF FAILURE

Pipelines are considered to be one of the safest methods of transporting oil. Nevertheless, there have been failures in the past. Historical pipeline data compiled by CONCAWE[1] allows pipeline designers and operators to determine which factors have contributed to past pipeline failures. Aggregation of the failure data and statistical analysis provides evidence of a progressive improvement in performance and helps to focus attention on the various causes of failure in order to develop appropriate preventative measures. The causes of failure can be split generally into 5 categories:

1. Mechanical
2. Operational
3. Corrosion Related
4. Natural Hazards
5. Third Party Damage

Table 2.1 outlines the historical causes and frequency of failure in western European pipelines. It is recognised that the geographical and political circumstances of BTC in Georgia are different than those in Europe. However this data is extremely useful to enable the understanding of the failure causes and types so these can be considered during pipeline routing, design and subsequent operations and contribute towards the prevention of pipeline failure.

Table 2.1 Historical pipeline spillage data - causes, frequency of failure and leak size proportion

Failure Cause	Failure Frequency (incidents/km-y)[1]	Proportion of Leaks by Leak Size (%)[2]		
		5mm or less	6–50mm	Rupture (Full Bore)
Mechanical – Line Pipe	8.44×10^{-5}	70	24	6
Mechanical – Valves and Fittings	5.06×10^{-5}			
Operational - System /Human Error	4.78×10^{-5}	75	25	0
External Corrosion	5.35×10^{-5}	90	9	1
Internal Corrosion	4.22×10^{-5}	90	9	1
Natural Hazards	1.41×10^{-5}	10	20	70
Third Party – Accidental / Incidental	1.55×10^{-4}	50	50	0
Third Party – Intentional	1.41×10^{-5}			

Notes

1. Data Source – CONCAWE Report 98: Western European Cross-Country Oil Pipelines 25 Year Performance Statistics, June 1998
2. Data Source – EGIG[2] data has been used as the basis for development of this table which hole size distributions modified by the engineering teams after consideration of the BTC project design

[1] CONCAWE = Conservation of Clean Air Water in Western Europe is an industry body which produces and analyses data reported on pipeline incidents in Western Europe

[2] EGIG = European Gas Pipeline Incident data Group

An analysis of the CONCAWE and EGIG data has been carried out and a brief explanation related to each failure type is outlined below.

2.1 MECHANICAL FAILURE

By far the greatest part of the pipeline system is the underground pipe itself. However, the most vulnerable areas to mechanical failure are pipeline valves, fittings, pump stations, with gaskets, glands and flanges a particular problem. The hole size is generally small and the average size of spillage through mechanical failure in the order of 200m^3 gross.

2.2 OPERATIONAL FAILURE

This category covers the operational problems related to system malfunction and human error. Except for their propensity to cause small sized spillages, there is no general trend apparent from the CONCAWE data.

Over the past twenty-five years, some pipeline systems have been more highly dependant on manual operations and others on control systems, with a wide range of complexity between the two. With very limited data on the control systems employed on the pipelines included in the CONCAWE database, it is not possible to draw any firm conclusions on the linkages between control systems and spillages from the pipelines.

What can be drawn from the data is that in the period from 1995 to 1999 (the latest figures), there were no system malfunctions, with spillages caused by human error only. The number of leaks associated with operational error are small by volume.

2.3 CORROSION

The CONCAWE data is subdivided in terms of pipeline service categories (hot and cold) and in terms of corrosion type (internal and external). Hot pipe service pipelines tend to be more prone to external corrosion than cold service pipelines. The BTC pipeline is regarded as being in the cold service category.

An important factor in cold pipeline corrosion is the much higher incidence of corrosion attacks in localised special sections of the pipeline (ie road crossings, anchor points, sleeves, etc). In the data compiled less incidences occurred from normal underground pipe runs, indicating that special sections are much more vulnerable than “normal” sections.

Internal corrosion is much less prevalent than external corrosion, however, insufficient information is available to enable an accurate correlation between the types of corrosion for a given set of fluid and environmental (soil type) properties and pipeline designs.

Corrosion leaks tend to be small with almost all falling into the “leak” (5mm) size category.

2.4 NATURAL HAZARDS

Natural hazards can be defined as natural landforms and processes that could potentially result in damage to the pipeline. Landslides, earthquakes and fluvial (river) processes are the natural hazards of relevance to pipelines.

Natural hazards accounted for 14 spillages in the period analysed, with 10 due to landslides or subsidence, 2 to flooding and 2 to other hazards. It should be noted that no less than 10 of the natural hazard induced spills have occurred in the same country. This appears to be a direct consequence of the difficult terrain and hydrological conditions that apply to a significant part of that country's pipeline network.

This category has the potential to cause major damage resulting in full bore rupture.

2.5 THIRD PARTY DAMAGE

The Third Party damage category accounts for the largest single cause of spillages within the CONCAWE region, and is also responsible for the largest proportion of the volume spilled.

Third party damage can be categorised into three main types: intentional/malicious, accidental and incidental damage.

2.5.1 Intentional/malicious damage

There have been spillages in the CONCAWE region caused by malicious damage by third parties in the period concerned, which are listed in Table 2.2 below. It should be noted that none of these incidents occurred in buried pipelines.

Table 2.2 Spillages caused by malicious damage

Cause	Number of Spills
Terrorist bombs	2
Vandalism	5
Theft	1
Totals	8

2.5.2 Accidental damage

In the case of third party accidental when spillages have occurred, over 55% of third party equipment operators were aware that there was a pipeline near by, whilst 55% of pipeline operators reported that they had no knowledge of the work in progress. These statistics suggest that there was a breakdown in communication and reporting.

An analysis has been made of the relationships between vulnerability to third party damage and physical attributes, with smaller pipeline diameters strongly related to higher vulnerability. The analysis established that pipelines below 8" size range were 2.5 times more vulnerable than average, whilst the 30"+ population suffered only about one tenth of the average frequency of incidents.

2.5.3 Incidental damage

Third party incidental damage includes those incidents where damage was done at some unknown point in a pipelines lifetime, which subsequently suffers deterioration over time resulting eventually in a spill. In general they result either from damage done during the original construction or some subsequent construction activity, or from damage done in unreported near-miss third party incidents.

There have been 18 incidental damage incidents, which all started from dents, scrapes and such like. All of these incidents may well have been detectable by intelligent pig inspections.

3 PREVENTION AND DETECTION OF PIPELINE FAILURE

During pipeline design, major attention is focussed on preventing loss of containment. The pipeline is routed and designed so that it can be safely constructed and operated and that the risk to the environment is minimised through the adoption of rigorous technical integrity measures. Accordingly the pipeline is designed as a minimum to conform to the internationally recognised design code for onshore oil transportation pipelines - ASME B31.4. The following design measures have been adopted by BTC.

- pipeline route alignment to avoid environmentally sensitive areas and natural hazards
- buried pipeline and burial depth
- wall thickness incorporating design safety factor
- ACG crude analysis for line pipe specification
- external coating system
- external corrosion protection system
- specialized design for natural hazards
- line separation between BTC and SCP pipeline >10m
- 8m wide ownership / exclusion zone
- adequate separation from existing utilities and infrastructure
- quality assurance and control
- block valve spacing on the basis of environmental risk
- leak detection systems

Additionally there are a number of operational measures which are included in the pipeline integrity management system which include:

- monitoring of fluid quality entering the system
- monitoring of the cathodic protection system
- internal inspection pigging
- planned maintenance
- operational staff training and competence
- pipeline patrols and surveillance
- landslide and river crossing monitoring
- public awareness

It is the combination of measures which work effectively to ensure that the failure modes are adequately addressed to prevent loss of containment. The suite of prevention measures are outlined in Table 3.1. This table outlines the prevention measures which address the various fault categories as described in Section 2. Further detail is given below.

Table 3.1 Design and operational spill prevention methods

		Potential Failure Mode Addressed							
	Prevention Measure	**Mechanical Fault**	**Operational Fault**	**Internal Corrosion**	**External Corrosion**	**Natural Hazards**	**Third Party Accidental**	**Third Party Deliberate**	**Leak Detection**
ROUTE	Route selection to avoid natural hazards; populated and environmentally sensitive areas					x	x	x	
DESIGN MEASURES	Buried pipeline (1m to top of pipe)						x	x	
	Increased burial depth at vulnerable areas					x	x	x	
	Wall Thickness	x		x		x	x	x	
	BTC Crude Analysis for Line Pipe Specification			x					
	External corrosion coating protection				x				
	Impressed current corrosion protection system			x					
	Specialised design for Geohazards areas (Faults, River Crossing, Landslides)					x			
	Line separation between BTC and SCP pipelines > 10m						x		
	8m wide ownership / exclusion zone						x	x	
	Adequate separate from existing utlities and infrastructure						x		
	Quality Assurance and Control	x		x	x				
	Hydrotesting	x							
	API Compliant Leak Detection System								x
OPERATIONAL MEASURE	Monitoring of fluid quality entering BTC system			x					
	Monitoring of cathodic protection system			x	x				
	Internal Inspection Pigging	x	x	x		x	x		
	Planned maintenance	x	x	x					x
	Regular patrols		x				x	x	x
	Operational staff training / awareness	x	x	x			x	x	x
	Landslide and River Crossing Monitoring					x			
	Public awareness						x	x	x

Note:"X" means failure frequency is potentially reduced by mitigation/prevention measure

3.1 PIPELINE ROUTING

Early during the pipeline design the pipeline route was selected specifically to avoid areas with known natural hazards or other features that could have jeopardised the integrity of the pipeline during its operation. This process has had the largest impact on minimising the risk of pipeline failure from third party incidents and natural hazards. Details on the pipeline routing assessment can be found in the Route Selection Report (Section 3) of this ESIA addendum document.

Nevertheless, there are some areas where natural hazards or populated areas could not be avoided. Therefore, design measures to ensure the integrity of the pipeline and protection of people have been incorporated. They are outlined in the next section.

3.2 DESIGN MEASURES TO PREVENT LOSS OF CONTAINMENT

The BTC pipeline incorporates a number of measures to prevent loss of containment, which includes design in accordance with ASME B31.4. This international code has been in use for 40 years and is regularly updated to ensure that it reflects the most up to date and current international and industry design practices. This recognised international code establishes the requirements for the basic design, quality of materials, workmanship, construction, inspection, testing, operation and maintenance of pipeline projects.

The design code takes into consideration internal & external pressure, temperature, ambient influences (expansion) and dynamic effects (including impact, subsidence and earthquake) for pipeline systems. Specific design measures encompassed by this standard are outlined below.

3.2.1 Buried pipeline and burial depth

Buried pipelines are much less susceptible to corrosion and third party intentional damage than above ground pipelines. As identified in Section 2.5.1, there have been no occurrences of spillages caused by malicious damage in buried pipelines in the CONCAWE region. Nevertheless, third party activities have resulted in leaks on both the Northern and Western export pipelines in Azerbaijan / Georgia and both of these pipelines are buried.

Several studies have been undertaken to understand the relationship between burial depth and frequency of pipeline failure. Table 3.2 summarises the findings from the studies.

Table 3.2 Summary of failure frequencies by depth of burial[1]

	Failure Rate as a Function of Burial Depth (1,000 km-years)			
Failure Type	**Normal 0.9m**	**1.5m**	**2m**	**3m**
Mechanical Failure	0.143	0.143	0.143	0.143
Operational Failure	0.047	0.047	0.047	0.047
Corrosion	0.085	0.085	0.085	0.085
Natural Hazards	0.013	0.013	0.013	0.013
Third party accidental	0.132	0.099	0.066	0.0013
Total	0.420	0.387	0.354	0.289

Note
[1] From a study of pipeline failure undertaken by A.D.Little Ltd (Pipes & Pipelines International, 1996) from information supplied by CONCAWE.

The BTC pipeline project has a minimum burial depth of 1m (to top of pipe). However, where there is an increased risk of third party impact the burial depth has been increased – such as at river crossings and road crossings where maintenance activities often involve the use of heavy digging machinery.

Whilst it could be argued that by increasing the burial depth there may be some marginal additional benefit in terms of prevention of intentional third party damage, this potential benefit is diminished when considered in conjunction with wall thickness (see below).

3.2.2 Wall thickness

The rational for determining wall thickness is initially based on the maximum operating pressure within a particular section of pipeline, taking account of the ground profile, and the maximum combination of the steady state and transient operating conditions.

ASME 31.4 incorporates a safety factor on wall thickness such that there is additional thickness above that which is required for pressure containment. The wall thickness, initially determined from the design stress for internal pressure containment, is further divided by a safety factor of 0.72 to give the design wall thickness. The resulting hydraulic wall thickness is then checked to ensure that it meets certain criteria, none of which are pressure related. These include;

- minimum thresholds for robustness within environmentally sensitive areas (ie not less than 12mm); specifically the wall thickness at KP 107 to 111, 119 – 129 and in the Thratskaro - Kodiana section were considered to ensure thickness exceeded 12mm
- checking that the wall thickness plus other construction parameters satisfy the stress requirements of API 1104 for both the rail and road crossings. The analysis has identified that the hydraulic wall thickness is greater than the stress wall thickness required. therefore, it is adequate for all road crossings at all but one of the rail crossings where the hydraulic analysis concluded that wall thickness should be increased from 14.3mm to 15.9mm
- applying additional wall thickness for the HDDs (horizontal directional drilled sections), ie not less than 21.4mm
- reviewing the strains imposed at faults crossings during an earth quake. The wall thickness at the Vale Fault has been increased from 23.0mm to 23.8mm

The assessment of wall thickness in relation to third party incidents is explained below.

Studies on pipelines with different wall thickness have highlighted that there is a significant reduction in the likelihood of failure as wall thickness is increased Specifically, the failure due to external interference (third party accidental) was found to be reduced by 96% for pipeline wall thickness of between 10 and 15mm when compared to pipelines of up to 4mm and 88% when compared to pipelines of 6 to 10mm wall thickness. In this regard, BTC has a wall thickness exceeding 12.7mm throughout the Georgian section which is significantly thicker than a majority of the pipelines included in the CONCAWE database (typically 4 to 8mm wall thickness). The risk reduction associated with wall thickness is shown in Table 3.3.

Table 3.3 Summary of failure frequencies by wall thickness

Wall Thickness (mm)	Failure Rate (1,000km-years)
0-5	0.750
5-10	0.220
10-15	0.025

In comparing the figures in Table 3.2 with those of Table 3.3 it can be seen that while increased burial depth has been shown to decrease the risk of failure from third party incidents, the risk

reduction associated with wall thickness is greater. Therefore, increasing the burial depth for the BTC pipeline will have negligible impact on risk reduction.

3.2.3 ACG crude analysis for line pipe specification

The corrosiveness effect of ACG crude oil has been analysed in line with standards from the National Association of Chemical Engineers (NACE RP-01-75) and ISO 15156. These tests established that sour line pipe specification was not required to handle the ACG crude.

After start up, the quality of the pipeline fluids will be monitored for conformance with the pipeline entry specification to ensure that certain limits are not exceeded eg H_2S and water. Third party entrants to the pipeline will be expected to meet the same specification.

3.2.4 External coating system

The BTC pipeline will have an external coating system applied to provide corrosion and damage protection. Extensive tests have been performed specifically for the BTC and SCP projects in selection of the pipe and pipe joint coating systems. On the basis of the tests and from experience on similar pipelines around the world a 3 layer Polyethylene coating system has been selected for the pipeline and an epoxy coating for the joints.

The pipeline will be externally cleaned by abrasive grit blasting to BS 7079, followed by a layer of fusion bonded epoxy, an adhesive layer and a layer of polyethylene with a total minimum thickness of 3mm (3 layer HDPE). This is a proven method for corrosion and damage protection on many pipeline projects worldwide. The field joints will be cleaned by abrasive grit blasting, followed by a liquid coating of urethane modified epoxy between 0.75mm and 1.2mm thick.

3.2.5 External corrosion protection system (impressed current)

The BTC pipeline will be protected from external corrosion by an impressed current cathodic protection (CP) system or sacrificial anode system. Where possible, permanent pipeline corrosion protection will be provided by transformer rectifiers and shallow horizontal ground beds located close to the block valve sites. At sites where AC power is not available, or ground/physical conditions preclude the use of impressed current CP, alternative protection will be provided through the use of sacrificial anodes. Buried piping and equipment within the pump station, pigging stations and block valves will be cathodically protected using an impressed current distributed anode system.

After the commissioning period, regular monitoring activities will be carried out to ensure that adequate protection potentials are being achieved along the pipeline and that the power sources are operating within their intended limits.

3.2.6 Specialised design for natural hazard areas

The pipeline route avoids areas of natural hazards and excessive erosion where possible. Where the pipeline crosses hazard areas, mitigations have been included in the pipeline design to ensure the integrity of the pipeline will be maintained.

Designs for landslide / mudslide areas

Where landslide and mudslide areas have not been avoidable detailed design has been undertaken in accordance with international best practice. These are detailed in the ESIA Addendum Section 5.5.2 and 5.5.3.

River crossing design

River crossings designs have been developed following consideration of hydrological and sediment load aspects with additional depth of cover and setback included in the design as required.

The pipeline has been designed to remain fully buried for the 40-year design life. The pipeline burial depths and set backs have been specified to allow for:

- Flood events; eg the one in 200 year flood event and debris flow events
- Lateral migration and bed scour
- Potential for changes in channel shape
- Potential for long-term degradation and fluvial (river) geomorphological change

Seismic designs

Similarly extensive assessment of seismic issues has been undertaken with seven seismic fault crossings identified on the pipeline route. In accordance with international practice special trapezoidal trenching designs have been incorporated into the design to preserve the pipeline integrity at these crossing locations.

3.2.7 Line separation between BTC and SCP pipeline >10m

The minimum separation distance between BTC and SCP pipelines has been established as 10m. This distance is based on study work that has been carried out for SCP which ascertained that the maximum distance which would be disrupted by a major SCP event is less than 10m.

3.2.8 8m wide ownership / exclusion zone

As is normal Industry practice, limits on activities in the vicinity of the pipeline will be defined in order to minimise the potential for damage to the pipeline. Permitted and prohibited activities in the vicinity of the pipeline will be defined and will be issued to all personnel. Pipeline activities will be monitored by pipeline patrolling, surveillance and liaison. This forms part of an integrated Pipeline Integrity Management System.

Activities will be categorised into prohibited and permitted and will be strictly enforced by Landowner Agreements within the 8m zone around the pipeline which is granted in the HGA.

Works close to the pipeline will, as necessary, be supervised and monitored. This will reduce the possibility that injurious activities could take place which could degrade the integrity of the pipeline.

This will also involve new third party works.

3.2.9 Adequate separation from existing utilities and infrastructure

The pipeline has been routed, where ever possible, to obtain adequate separation from existing utilities and known infrastructure. Where existing utilities have to be crossed by BTC this will be the subject of a special crossing. This will be carried out to ensure there is adequate separation and in accordance with work permit procedures etc.

All works or proposed works by other utilities in the vicinity of the pipeline, whether they are new services or alterations, diversions or remedial works will be subject to agreement in advance to ensure that the separation distances are maintained. Similar arrangements will be introduced for road, rail and canal crossings.

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3.2.10 Quality assurance and control

BTC project management team, contractors and suppliers are developing the project, equipment and materials according to the international quality system requirements ISO 9000.

The pipeline will be manufactured according to specification API 5L which includes specific requirements for: treatment and testing of materials, and inspection procedures used during fabrication. Inspection of materials during fabrication will be performed to ensure that quality is obtained and maintained in accordance with the relevant design codes and specifications.

Independent third party inspection will be involved at various stages during manufacture and construction.

All materials will be subject to unique traceability and certification. The manufacturers and constructors are required to establish and follow procedures for maintaining unique identity until all required tests are performed and conformance with specification requirements is demonstrated. This traceability will be continued into the operational phase.

Material controls

To ensure consistency of product, the line pipe must conform within specified parameters including but not limited to; yield strength, ductility, toughness and chemical composition. Line pipe material samples will be taken during manufacture for testing to ensure that specified parameters are maintained.

Fabrication and welding controls

Prior to fabrication of the line pipe, the longitudinal edges of the strip/plate that will be used to fabricate the pipe will be 100% ultrasonically tested for laminar imperfections in accordance with ISO 12094 (Ultrasonic testing for detection of laminar imperfections in strips/plates used in the manufacture of welded tubes).

Welding procedures will be established to ensure that welds having suitable mechanical properties and soundness can be continuously produced. Welding procedures and each welder or welding operator will be qualified under API 1104, or section IX of the ASME boiler and Pressure Vessel Code, whichever is appropriate for the type of welding to be performed.

The qualified welding procedure will specify the parameters to be followed for consistently assuring the quality of welding processes.

During the construction stage all welds will be checked by non-destructive methods such as radiographic or ultrasonic examination to ensure that unacceptable weld defects are not present. Non-destructive examination will meet the requirements of API 1104, ANSI B31.4 and ASME V.

Pipe coating inspection and testing

External coating of pipeline will be visually inspected and mechanically tested using sampling techniques and finally accepted by electric holiday detectors according to specifications and International standards. The standards for application and testing of coating are from various standards authorities such as: ISO, DIN, BS, CAN/CSA, ASTM. Third party inspectors will be involved in all coating processes at coating plants and at the construction sites.

Final checking of pipeline and coating will be performed just prior to lowering the pipe into the trench. Any damage to the coating which is detrimental to the effective corrosion control will be repaired and re-inspected.

Valves

Pipeline valves will be manufactured and tested according to established international standards ISO14313 and API 6D plus project specifications. Each valve will be thoroughly tested to ensure its pressure containment and closure capabilities before dispatch. Third party inspectors will be involved in all manufacturing and testing processes.

Once installed into the pipeline additional functional tests will be performed and verified.

Other equipment and materials

BTC pipeline, facilities and above ground installations comprise many components and equipment (products). Each product is designed, manufactured and tested according to established national or international standards, supplemented where appropriate by unique specifications. Criticality assessment is performed to determine associated risks of failure. Mitigating measures are taken where risks are deemed high or unacceptable and additional assurance or quality control intervention is invoked.

Pipeline hydrotesting

Once constructed, the pipeline will be hydrostatically tested to not less than 1.25 times the internal design pressure, with the pressure held for a period of no less than 24 hours to ensure no leaks have occurred. Any leaks that are identified during test will be investigated, corrective action will be taken to determine the cause, followed by repair and inspection. Further hydrostatic testing will be performed to verify pressure containment of the pipeline.

3.3 LEAK VOLUMES – LEAK DETECTION AND SYSTEM SHUTDOWN

The previous section outlines in detail the measures in place to prevent loss of containment of the pipeline. Nevertheless, there is always a small risk of a leak. If a leak occurs there are design measures in place that ensure that the leak is both detected, the system is shut down thus limiting the volume leaked.

As outlined in Section 10.5. of the ESIA, the volume released by the leak is influenced by the following factors:

1. the extent of pipeline damage (hole size)
2. pressure at the leak site during operation and system shut in
3. pipeline diameter and pumping rate
4. valve spacing
5. time required to detect the leak, shut down the pumps and close the valves
6. topography in the vicinity of the leak

This section will concentrate on those factors which are influenced by pipeline design – namely, pipeline pressure, leak detection, valve and pump shutdown times and valve spacing.

3.3.1 Pipeline pressure and diameter

Traditionally, onshore pipelines are designed to operate up to100 bar pressure. This is largely driven by safety issues, and by the relative low cost and freedom to install pump stations where required (unlike the case of offshore pipelines with design pressures of around 150 bar, where intermediate pump stations could be very costly). Nevertheless, there may be a case for increasing pipeline pressures in order to eliminate the need for a pump station. Environmental advantages associated with the elimination of a pump station include:

- reduction in land take
- reduction in visual impact
- reduction in emissions (mainly from ancillary power generation equipment)
- reduction in the need to access remote, environmentally sensitive area

In choosing to eliminate a pump station in Georgia, the design pressure rating of equipment has had to be increased to a nominal class 900 rating rather than a nominal class 600 rating, whilst the diameter has been increased from 42" to 46".

While it is true that higher pipeline pressures could result in the fluid in the pipeline to be released faster in the event of a leak, the total potential volume released is related to the valve spacing and the pipeline diameter. Valve spacing has been determined by utilising the risk assessment model and is described in Section 3.3.2 below. However, it should also be noted that when comparing the 3 pump station case to the 2 pump station case, for the Thratskaro – Kodiana section, the 2 pump station case actually reduces the pipeline pressure in this area. This is shown in Figure 3.1.

Figure 3-1 Operating pressures for 3 vs. 2 pump stations

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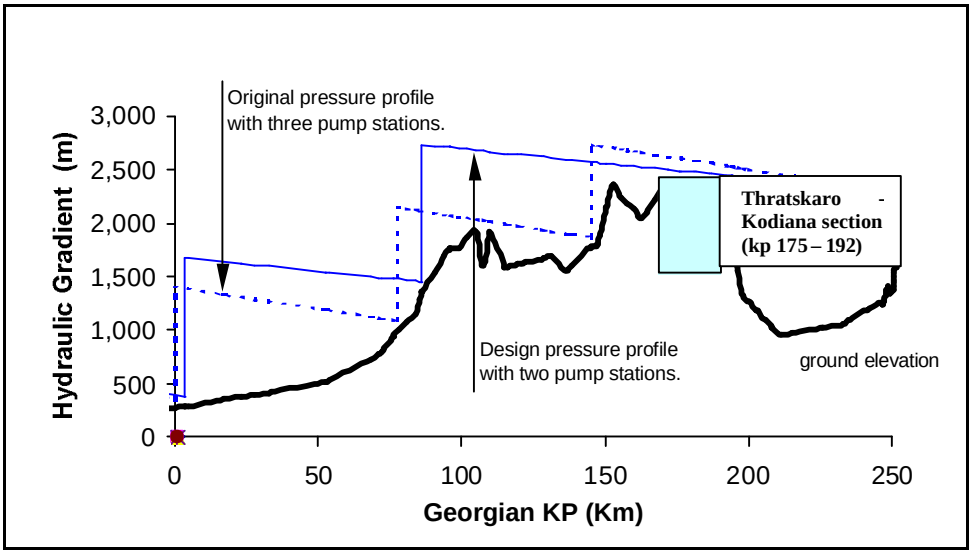


3.3.2 Valve spacing

BTC design complies with both NEN 3650 and BS8010 which relate to valve spacing. The valves have been spaced according to an environmental risk assessment (ERA), not on a regular spacing basis, as is often the case. The ERA model was developed and employed, utilising input data such as : historical failure data, spill volumes and environmental sensitivity. The outputs from the ERA model were considered, and (where appropriate) modifications to the design were made in areas identified as having high environmental risk. A summary of the ERA process is contained in Section 10.5 of the ESIA.

As a result of the ERA process three additional valves were added in Georgia, to reduce the potential spill volumes:

- in the Thratskaro to Kodiana section an additional ball valve at KP 179.5 and an additional check valve at KP 188.0
- in the Tiseli to Mtkvari section an additional ball valve at KP 213.2

3.3.3 Leak detection

The requirements for the leak detection system have been established based on the API standard 1155.

The options were evaluated on the ability to meet the following requirements:

"The leak detection system must:
- *be able to detect a leak of less than 1% flow, in less than 60 minutes to an accuracy of 500m*
- *have a minimum number of false alarms*
- *be robust and reliable*
- *have a proven track record under conditions similar to those along the BTC route"*

Industry experience has highlighted the fact that no one detection technique can meet all of these criteria therefore a combination of leak analysis methods is required. The process adopted in selection of the leak detection system and components selected is set out below.

The API 1155 compliant system

A system which is API 1155 compliant will be the primary method utilized for leak detection for BTC and combines a number of analytical techniques into one system:

- mass balance analysis
- pressure point / drop analysis
- acoustic pressure wave analysis
- real time transient model (computer based analysis)
- statistical analysis (computer based analysis)

The basis of the analysis method is described below.

Petroleum products expand and contract due to temperature and pressure changes along the pipeline. Therefore, simple **Line Balance** ("barrels in" must equal "barrels" out) is not precise enough. The system must account for the effect of varying flow rates, temperature, pressure and the different behaviour of the crude along the pipeline. Therefore, it is necessary to state that 'the mass flow into the pipeline must equal the mass flow out of the pipeline' in other words a **Mass Balance** method.

In addition, when a pump is started, the flow into the pipeline cannot equal the flow out of it until all the oil in the pipeline has been fully compressed. This process is called line pack, which can take many minutes. During this period, the flow into the pipeline will be greater than its output. If no leak occurs during this time it is necessary to avoid declaring a false alarm. To address and overcome this issue the leak detection system technology must incorporate an "Acoustic Pressure Wave" method of leak detection.

It is essential that the leak detection system be sensitive enough to detect very small leaks. But if, in an attempt to achieve this sensitivity, the system becomes instable a significant number of false alarms will likely occur resulting in the operators ignoring the alarms.

Pressure point/drop analysis tends to be used when there is no flow and the pipeline is blocked in at the pumping stations and/or at block valve sites. This approach can also be used to supplement analysis when the pipeline is running in slack flow, with the system used to check that pressures at specific points do not change.

Acoustic pressure wave. This method of detection takes advantage of acoustic waves that are produced when there is a leak. Any leak produces a drop in pressure in the pipeline at the leak site, which produces acoustic waves travelling up and down the flowing stream. To utilise this acoustic method vendors require the time recording resolution within the ICSS to be capable of identifying individual alarms to within less than 5 milliseconds. There are other issues associated with pressure wave analysis, namely : bends in the pipe reduce the wave ; and a minimum of 0.3 bar pressure drop is required in the pipeline for the sensors to pick up the acoustic pressure waves.

Several leak detection system vendors supply a software package that encompasses the Mass Balance, Pressure Point and Acoustic Pressure Wave leak detection methods. Using both

pressure and mass flow to check each other, the time to alarm on a leak is increased but it does reduces false alarms and increases operator confidence, but alarm thresholds still have to be increased to cover operating fluctuations.

Another software tool available is **Real Time Transient Model (RTTM)** and is often referred to as Real Time Model (RTM). In addition to the "pressure/flow & temperature" method above it also takes into account the physical pipeline parameters and fluid characteristics. Use of RTTM required the development of a mathematical model in an attempt to enable the prediction of flow rate with pressure at various points along the line. Development of such models also allows for off-line simulation and operator training.

The latest software tool mentioned in API 1155 is **Statistical Analysis**, which in its simplest form could be used on a single parameter to indicate an operating anomaly. More sophisticated uses of this analysis tool allow correlation of more parameters over both short and long time periods. For example if this statistical approach was used on Mass Flow Line Balance "over/under shoot" data from normal operations, it would be possible to establish upper/lower volume imbalance limits and establish new alarm settings (reducing false alarms).

Other leak detection techniques

There are several other techniques which may enable the detection of very small leaks that may not be sensed by the API compliant leak detection system. However, these leaks will only be detected when the equipment is deployed as they are not "continuous monitoring" methods. As such, these methods tend to be "operational measures" rather than "design measures". While one or more of these measures may be an appropriate compliment to the main leak detection system, they would only be employed if deemed necessary through the risk analysis as outlined in Section 3.4.1. This will be carried out as part of the next phase of the project. The reliability and applicability to BTC pipeline would also need to be established as part of this process.

The variety of options and their associated performance are outlined in Table 3.4. The inclusion of an option in this table does not necessarily imply that the technique is viable for the BTC pipeline.

Table 3.4 Leak detection and monitoring techniques

Leak Detection and Monitoring Techniques	Leak Size	Time	Location	False Alarms
Leak Detection System combining all systems covered in API 1155				
Mass balance	1%	1 hour	N/A	5/week
Pressure point/drop analysis	1%	1min	N/A	10/week
Acoustic pressure wave	-	1min	+/-800m	5/week
Real Time Transient Model	2-3%	30mins	+/-2Km	10/week
Statistical Analysis	Less than 1%	1 hour	+/-500m	<1 a month
External Pipeline Monitoring Techniques (Includes Spill Detection)				
Hand held Ultrasound System	Kg/s	When used	+/-1m	N/A
Right of way Monitoring	Small to Medium	When there	+/-1m	N/A
Satellite Surveillance	Medium	When used	+/-50m	N/A
Sniffer Dogs	Small	When there	+/-1m	Possible
Real Time Damage Monitoring	N/A	Real Time	+/-50m	Possible
Sniffer tubes & diffusion Hoses	N/A	N/A	N/A	N/A
Tracer	N/A	When used	+/-1m	Possible
Electro-chemical Sensing Cable	N/A	Real	5m	Possible
LIDAR	N/A	N/A	N/A	N/A
Metal Oxide Semiconductor MOS	N/A	N/A	N/A	N/A
FO System Refractive Light	N/A	Real Time	?	Possible
FO Acoustic System	N/A	Real Time	Approx. 5m	N/A
Ground water/soil Monitoring				
SCAPS	N/A	N/A	N/A	N/A
Hydrocarbon detector sensor	N/A	?	N/A	Possible
Liquid phase product solubility	N/A	?	N/A	N/A
Liquid phase Radio freq. Attenuation	N/A	?	N/A	N/A
Liquid phase product Permeability	N/A	?	N/A	N/A
Liquid phase refractive index	N/A	?	N/A	N/A
Floating Buoy	N/A	?	N/A	Possible
Fish Monitoring	N/A	?	N/A	Possible
Leak Detection Pigs				
Pressure Differential Leak Detection Pig	?	?	?	?
Acoustic Scan Pig	Less than 0.1%	When used	+/-1m	N/A
Radioisotope leak detection Pig	Kg/s	When used	+/-1m	N/A

3.3.4 Pump and valve shutdown times

Other aspects of the system design that are particularly relevant to the determination of system shut down times are pump inertia and surge pressures resulting from rapid shutdown, valve design, operator performance and system software design. Thus, non steady state (transient) analysis was undertaken to determine the pressures along the pipeline during inadvertent block valve closure or during pump station shut down.

For the purposes of the ERA, the pump shutdown time was estimated to be 10 minutes whilst that for the block valves was also 10 minutes. However, through the detailed design process it has been determined that the pumps could be shut down within 2 minutes, whilst the block valves could be closed in 7 minutes, yet remain within the design pressure limits. This represents the ideal case as it relies on operator intervention and assumes that the operator could respond in this timescale.

Further analysis of leak detection and system shutdown times has confirmed that the spill volumes outlined in the ERA may be conservative and that should a full bore rupture occur, spill volumes may be 30% less than the volume outlined in the ERA.

Table 10.15 from the ESIA has been updated to reflect this and is shown below as Table 3.5.

Nevertheless, to ensure a conservative approach is taken during the development of the oil spill response measures, the earlier more conservative assumptions are being retained as the "base case". The project will also continue to examine the various system components to identify other potential methods for reducing system shutdown times and/or spill volumes.

Table 3.5 Revised leak detection and system shutdown estimates for the three hole size scenarios

Activity	5mm Hole	50mm Hole	Full Bore Rupture
Time to detect and confirm leak	48 hours[1]	1 hour	1 minute
Time to shutdown pumps	2 minutes	2 minutes	2 minutes
Time to close block valves in affected section	7 minutes	7 minutes	7 minutes
Total time (rounded) from detection to system shutdown	48 hours	69 minutes	10 minutes

Note 1 - These response times assume that the leak is detected via pipeline patrols rather than the leak detection system.

3.4 OPERATIONAL MEASURES

This section outlines those operational measures which play a role in either leak prevention or leak detection.

As mentioned previously, the development of the detailed operational measures are only now being commenced, as is typical of a pipeline project. Therefore, this section describes the operational concepts and measures which will most likely be in place but does not necessarily give detail around the type and frequency of the activity.

3.4.1 Pipeline integrity management system

The risks to a pipeline's integrity are governed by its physical characteristics, its environment and its operation. The risks are managed by competent design, construction, installation and selection and implementation of appropriate prevention and control measures during its operation.

The means by which the risks to the operational integrity, of the BTC Pipeline will be managed, will be through the Pipeline Integrity Management Scheme (PIMS).

The PIMS structure assures the integrity of the pipeline through the following processes:

- Identification, through risk assessment, of the failure modes, which might affect the integrity of the pipeline
- Development of appropriate, risk based, inspection & mitigation schemes
- Definition of monitoring requirements
- Definition of acceptance criteria
- Implementation of monitoring, inspection and testing routines
- Review of monitoring, inspection and testing data
- Re-assessment of risk based on the reviewed data
- Revision of inspection & mitigation schemes
- Control of changes to the pipeline system through a rigorous Management of Change Procedure
- Measurement of the performance of the scheme through reporting and monitoring against key performance indicators
- Auditing of the integrity management process both internally and externally to the Pipeline Operations Group
- Benchmarking the process against industry standards and best practice

3.4.2 Monitoring of fluid quality entering BTC pipeline

While the monitoring of fluid quality entering the BTC system is an operational activity, it has been previously discussed in Section 3.4.2.

3.4.3 Monitoring of the corrosion protection system

The performance of the impressed current cathodic protection system, installed on the pipeline, will be routinely monitored as follows:

- Regular checks on CP Transformers
- The CP potential at the CP test posts will be regularly measured. The measurements will be recorded and assessed to ensure that the protection of the pipeline is maintained at an effective level
- At regular intervals, Close Interval Potential Surveys will be undertaken to ensure that protection levels, between test posts, are adequate. Where a CIP survey indicates an anomaly, the anomaly will be further investigated using DVGC (Direct Voltage Current Measurement) techniques or, if necessary, by excavating in the area of the anomaly and making any repairs, to the pipeline coating, which might be required

3.4.4 Internal inspection pigging (intelligent pigging)

Internal inspection pigging is used primarily for defect monitoring which enables potential problems to be identified and rectified well before a leak occurs. Intelligent pigging is used as a tool for prevention of a leak by providing an assessment of pipeline integrity.

Anomalies in a pipeline are not unusual, as they are often the result of manufacturing processes. If the pipeline survives the hydrostatic test, such an anomaly will not necessarily have any influence on the integrity of the pipeline.

Intelligent pigging is usually carried out during the early period of pipeline operation to provide a baseline record of the pipeline showing the variations in wall thickness, and any defects or anomalies that are present. The results of the initial "baseline" survey are also analysed to determine whether any major anomalies have occurred between hydrotesting and the baseline intelligent pig run.

Subsequent intelligent pig runs indicate whether any of the original anomalies have grown compared to the original baseline survey, or if any new anomalies are present. These anomalies are then assessed to determine the impact of these on the existing integrity of the pipeline, and the potential for their growth and future risk to the integrity of the pipeline. Anomalies that are determined to pose a risk to the pipeline integrity, either now or in the future will be repaired. The intent is to locate and repair those anomalies before they become a problem. It is a preventative action carried out as part of Pipeline Integrity Monitoring by the Operations Team to ensure integrity is maintained.

By analysing anomaly growth and the presence of any new anomalies a decision can also be made regarding the frequency of intelligent pigging required. However, based on past experience the frequency of pigging is likely to be every five to ten years.

3.4.5 Planned maintenance

A structured approach to maintenance optimisation will be adopted; based on the appropriate application of condition based, planned preventative and corrective maintenance techniques. Maintenance scopes and frequencies will be derived through the assessment of risk and equipment criticality, based upon consistent safety, environmental and commercial criteria.

The maintenance program will be, periodically, reviewed and audited to ensure that its effectiveness is maintained and to highlight where improvements could be made.

Maintenance and spares will be controlled through a computerised maintenance management system.

3.4.6 Regular horseback patrols

Patrolling the pipeline by horseback is one of the few practicable methods of assessing all areas of the pipeline route on a regular basis. It is a visible reminder to people living and working along the pipeline route of the presence of the pipeline and plays a key role in preventing pipeline faults through third party incidents.

It is recognised that ground patrolling has limitations related to terrain, crops, ground conditions and snow. In places, vantage points may have to be used to view the pipeline route due to access

problems. It should be pointed out however, that any limitations to the horse patrol will also be a limitation to any potential third party activity.

The horse patrols will be supported and monitored by vehicle based, BP Pipeline Patrol technicians. The predictability of routine patrolling presents a window of opportunity for intentional, illegal activities on the pipeline ROW. Hence, wherever possible, a degree of randomness will be introduced into patrol routines, using both the vehicle and horse patrols as an effective, cohesive unit.

3.4.7 Operational staff training and awareness

Pipeline Patrol Technicians and Horse Patrol personnel will receive training in pipeline patrol techniques, identification of illegal tap sites and other 3rd party interference. Additionally, to aid apprehension of those intending to carry out illegal activities on the pipeline, the patrol personnel will receive training in the recognition and protection of evidence.

Pipeline Operations personnel, including Pipeline Superintendents, facilities Supervisors, facility operators, facility mechanics and pipeline patrol personnel will all receive Emergency and oil spill response training. The level of training will be structured to suit the emergency response and oil spill response roles and responsibilities of the various positions. The training will be wide ranging, from OSR equipment familiarisation for Pipeline patrol and facilities operations personnel to major emergency management training for the Pipeline Superintendents and Facilities Supervisors. Personnel will, regularly, take part in various levels of Emergency Response training exercises.

Pipeline Control Room and Facilities Operators will undergo, early (prior to start-up), training in both Pipeline Control and Pipeline Hydraulics. Training in both these aspects will be facilitated through the use of Pipeline Control System and Pipeline Hydraulics simulators. A structured approach to training will ensure that Operators attain levels of competency appropriate to their defined roles and responsibilities.

3.4.8 River crossing and landslide monitoring

In addition to the normal pipeline patrol, periodic surveys will be carried out of all river crossing points, and potentially affected water and ground locations. For rivers the frequency of the survey will be determined by the nature of the river and, in particular, the tendency towards river bed and bank movement and by the occurrence of a significant event (eg storm).

Inspection and survey will address two main areas, pipeline cover (river bed level) and river bank erosion. Inspection/survey will also take place up and downstream of the defined river crossing and will report on the condition of the river bed and bank and on any activities that may affect the river crossing in the future.

Photographic records will be available from pre and post construction. These, along with the as built drawings will form the baseline for subsequent surveys. In order for accurate surveys to be carried out it will be necessary to have local reference points (monitor or monument markers) to which any survey can be referenced.

Periodic surveys will be carried out to determine the profile of the river bed and any erosion or deposition. The exact method used to carry out the survey will vary dependant upon the size, depth and speed of the river.

Monitoring programmes based on similar principles will also be in place for landslide areas.

3.4.9 Public awareness

The Pipeline Public Program (PPP) provides contact and a sharing of information with local authorities, landowners and enterprises along the route to ensure normal operating conditions. The program includes daily working contacts, through the pipeline patrol personnel, and periodical group meetings on the following structure and content:

- Basic information on BP's activities in Azerbaijan/Georgia. Operation of the Pipelines and its significance for the country's and people's future
- Familiarization with basic rules of agricultural, excavation and irrigation, repair and service work in the pipelines' ROW. Liability for violation of the secured area
- Joint travel to the route, on-site determination of specific areas of liability of each landowner and land user
- The signing off minutes of meetings (Protocols) with the administrations of villages and enterprises, landowners, police and equipment operators. Exchange of telephone numbers

4 REDUCING THE ENVIRONMENTAL IMPACT – OIL SPILL RESPONSE

The previous section outlines leak detection and system shutdown elements. The final two steps in the oil spill mitigation is the effective deployment of a field response in order to contain the spill and minimise the impact on sensitive receptors.

As outlined earlier, oil spill response planning is typically carried out between ESIA submission and the commencement of pipeline operations. The schedule for oil spill response planning is outlined in Appendix E Annex V of the ESIA and is current being worked according to the framework. Prior to pipeline operation the oil spill response plan will be submitted to the Georgian Authorities in accordance with the HGA.

There has been some initial investigative work carried out as part of the Oil Spill Response Planning for the Thratskaro – Kodiana section of the pipeline. This is outlined in Section 5.

5 THRATSKARO – KODIANA: ADDITIONAL CONSIDERATIONS

5.1 INTRODUCTION

The previous section of the report outlines both the design and operational measures being implemented for BTC pipeline over the entire Georgian section including the Thratskaro – Kodiana section which is from KP 175.5 to KP 192. Through these design and operational measures, the BTC pipeline is in line with international standards for pipelines and will ensure that the environment along the entire route of the pipeline - including the Thratskaro – Kodiana section – is protected from loss of containment

Nevertheless, feedback from the ongoing meetings with the public, MOE and GIOC and other interested parties has highlighted the importance of the Thratskaro to Kodiana section of the route to the Georgian people. Therefore, considerable extra engineering and operational planning effort has been and continues to be focused on assessing the risk reduction value of additional mitigation measures. In particular, considerable work has been undertaken to:

- Better understand the value of additional design and operational oil spill prevention measures applied specifically to the Thratskaro – Kodiana section
- Assess measures that could be employed to ensure effective response in the unlikely event of a spill in the Thratskaro – Kodiana section of the pipeline

This assessment was initiated ahead of the original schedule outlined in the Oil Spill Response Plan Framework (Appendix E Annex V of the ESIA).

Table 5.1 outlines the additional mitigation measures which are being assessed or implemented for the Thratskaro – Kodiana section. These fall into the general categories of design and operational mitigation measures. At this stage of the project, the majority of potential additional design mitigation measures have been assessed and either accepted or rejected. However, some details around operational mitigation measures still need to be completed. This will occur in the next phase of the project – between design and commissioning. Consultation with stakeholders will continue throughout this stage.

Table 5.1 Additional mitigation measures considered for the Thratskaro-Kodiana pipeline section

		Potential Failure Mode Addressed							
	Prevention Measure	Internal Corrosion	External Corrosion	Mechanical Fault	Geohazards	Third Party Accidental	Third Party Deliberate	Enhanced Leak Detection	Minimisation of Potential Impac
DESIGN MITIGATIONS	Relocation of IPGS 1			x					x
	Tape in Trench Above Pipe					x	x		
	Additional route markers					x	x		
OPERATIONAL CONTROLS	Increased pipeline patrols					x	x	x	
	Groundwater monitoring							x	
	Increased public awareness					x	x		
	Oil Spill Response Plan development accelerated in Thratskaro - Kodiana area								x
	Oil spill response equipment and team located in the Thratskaro - Kodiana area								x
	Enhanced oil spill containment capability (under assessment)								x

5.2 ASSESSMENT CRITERIA FOR ADDITIONAL MITIGATIONS

The additional design and operational mitigation measures are assessed in terms of "risk reduction value". The decision process is both qualitative and quantitative and takes technical feasibility, cost, secondary environmental impact, operational reliability and stakeholder views into account.

5.3 ROUTING MITIGATIONS

Consideration for rerouting the pipeline out of the Thratskaro – Kodiana section has been considered and is outlined in detail in the Routing Selection Report (Section 3 of the ESIA Addendum).

While most landslide areas have been avoided, landslides are present at Kodiana Pass. Site investigations have been undertaken in this area and a design incorporating pipeline burial to below the basalt interface has been developed as a result of these investigations. General mitigations for natural hazards are discussed in Section 3.2.6.

5.4 ADDITIONAL DESIGN AND OPERATIONAL MEASURES CONSIDERED

5.4.1 Increased wall thickness and burial depth

Section 3.3.1 and Section 3.3.2 outlines the rational for the determination of wall thickness and burial depth. This methodology was applied to the whole pipeline. Additional thickness in the Thratskaro – Kodiana is unlikely to reduce the potential of third party accidental damage as the design is already greater than 15mm. Additional wall thickness and increased burial depth were therefore rejected.

5.4.2 Detector cable

A buried detector cable which can detect the presence of hydrocarbons through a sampling and analysis type process was considered but rejected on the grounds of technical viability and limited and poor experience of such systems. Similarly a buried "trip wire" system which when broken indicates the presence of a third party was discounted on the basis of low reliability and probability of spurious alarms.

5.4.3 Relocation of IPGS 1

As mentioned in Section 2, although small, the risk of mechanical failure and leakage is greater for fittings and valves than for the pipeline itself. Therefore, from a risk / location point of view, it was deemed preferable to relocate IPGS1 out of the Thratskaro – Kodiana area. There are additional environmental benefits associated with this move related to access roads and visual impact minimization. This additional measure was accepted and is part of the design base case.

5.4.4 Closer valve spacing

The environmental risk assessment model was used as a tool to better understand the changes in the environmental risk associated with changes in the number of block valves. It was used to carry out a detailed analysis of the impact of closer valve spacing on environmental risk and spill volume reduction in the Thratskaro – Kodiana section.

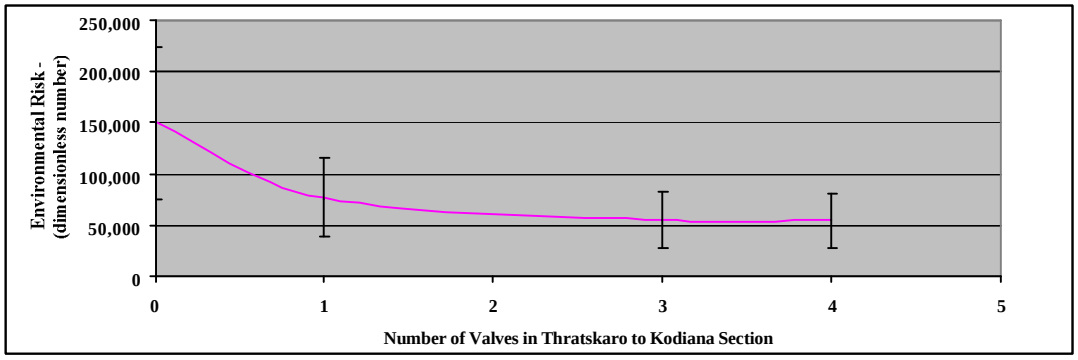
Scenario 1 – Model runs assuming a 21 minutes from detection to shutdown

The model was run for 4 different valve scenarios

- no valves
- one valve
- three valves (design base case as outlined in Section 3.3.4)
- four valves

As mentioned previously, for the purposes of the ERA, the pump shutdown time was estimated to be 10 minutes whilst that for the block valves was also 10 minutes. Time to detect the rupture is 1 minute. This is a total of 21 minutes from time of leak to full valve closure.

Figure 5-1 Environmental risk for different numbers of valves in Thratskaro to Kodiana section



Notes to graph

- Spill volumes and hence environmental risk are assessed by kilometre
- No distinction is made between check valves (which close instantly if the flow starts to reverse) and ball valves (which close at pre determined speeds to avoid the development of pressure surges in the pipeline)

Figure 5.1 shows that the most significant reductions in risk occur in moving from the "No Block Valve Case" to the "Refined Base Case" of 3 block valves. The addition of more valves has negligible benefit in terms of environmental risk reduction. While this may be counter-intuitive, the reasons for this lack of significant risk reduction are explained below and are shown in Table 5.2.

The elements, which influence environmental risk, are as follows:

- likelihood of failure and associated failure scenario (ie leak, hole or rupture)
- volume of oil spilled
- environmental sensitivity and potential movement of the oil to environmental receptors

In moving from three valves to four valves, these elements either increase, decrease or stay the same as shown in Table 5.2.

Table 5.2 Net changes in risk elements in going from 3 to 4 valves

	NET CHANGE BETWEEN 3 and 4 VALVES				
RISK ELEMENT	**Leak**	**Hole**	**Rupture**	**Net Change**	**Comments**
Likelihood of Spill	⇧	⇧	no change	⇧	Likelihood of leaks increases due to the addition of the valve. Block Valves may also be a potential target for third party intentional damage. No allowance for this potentail increase in likelihood of failure has however been included in the assessment.
Volume of Spill	no change	no change	⇩	⇩	Small decrease in volume in the rupture case in the vicinity of the block valve.
Environmental Sensitivity	no change	no change	no change	**no change**	Environmental sensitivity is independent of the number of block valves
Environmental Risk	⇧	⇧	⇩	**no change**	**The net environmental risk of 3 vs 4 valves stays approximately the same because the slight decrease in volumes for the full rupture case is offset by the increased likelihood of a leak or hole for the 4 valve case**

Environmental Risk = Likelihood * Volume * Environmental Sensitivity

Figure 5.2 compares the volume differences between the 3 and 4 valve options for the rupture case. Although there is an oil spill volume reduction due to the addition of a fourth valve in the area, this reduction is much less than may be expected. This is because a large percentage of the spill volume is associated with oil flowing through the pipeline prior to the leak being detected, the pumps stopped and valves closed. This shows the diminishing returns associated with additional block valves in reducing spill volumes. This fact, coupled with the various uncertainties associated with the analysis, it is concluded that no incremental benefit in reducing volumes would be obtained in addition of a fourth block valve in the Thratskaro to Kodiana section.

Figure 5.2
Comparison of Spill Volumes From Refined Base Case (3 Valves) and 4 Valve Case

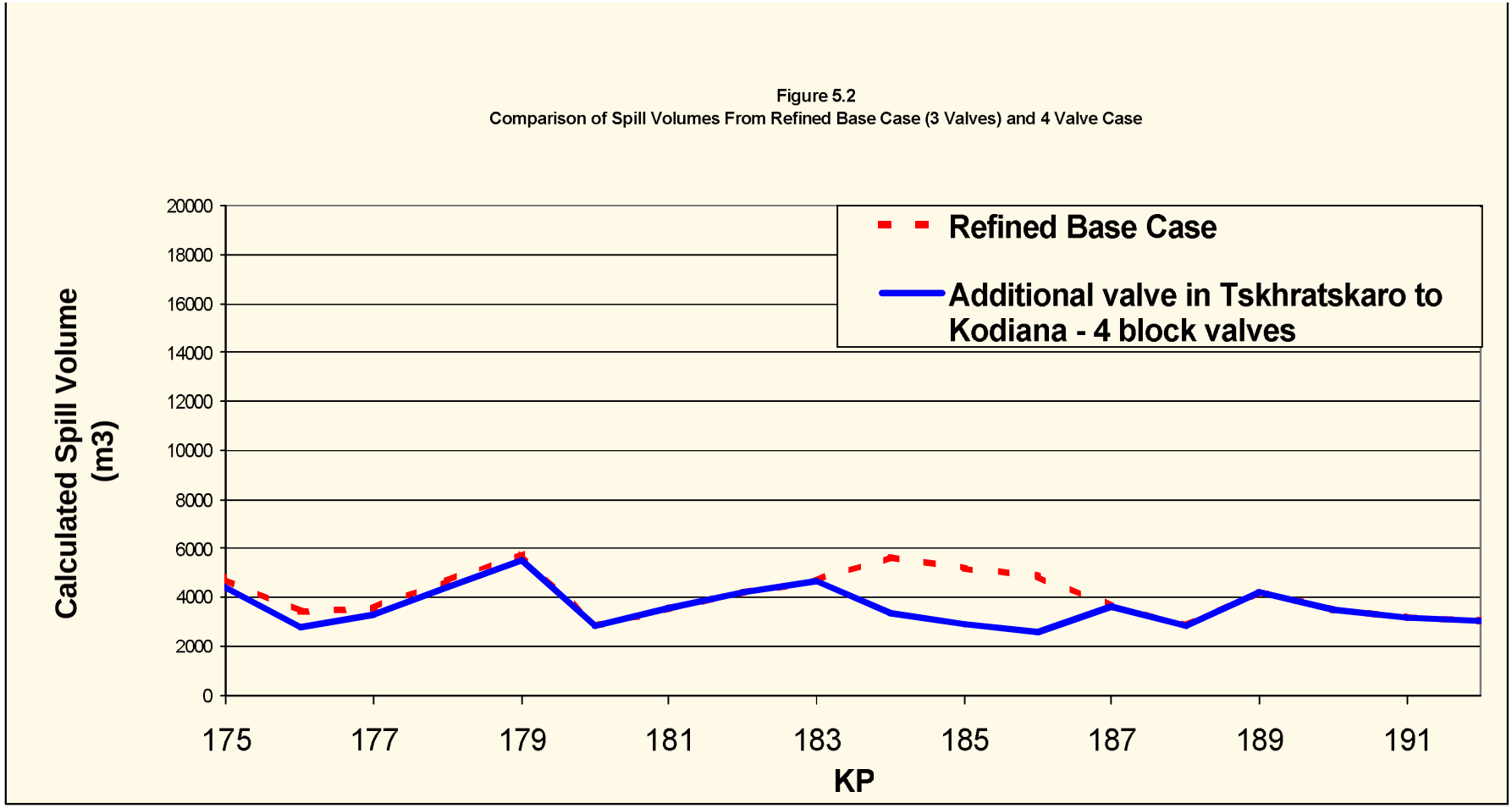
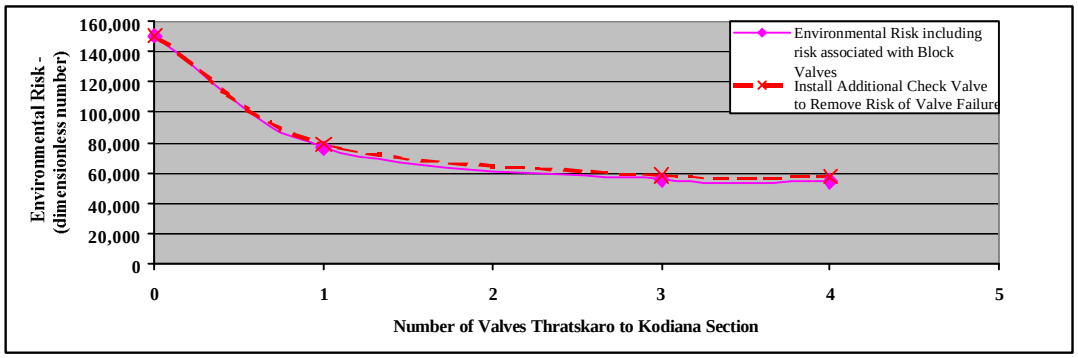


Figure 5-2 Spill volumes (rupture case) different numbers of valves in Thratskaro to Kodiana section

A similar approach was adopted in assessing the relative risks associated with an additional check valve. In undertaking this assessment the reliability of the check valves was assumed to be 99% and the risk calculated accordingly. Figure 5.3 depicts the outputs from this analysis.

Figure 5-3 Environmental risk reductions associate d with the addition of a backup check valve



Notes
The solid line depicts the environmental risk for different number of block valves in the Thratskaro to Kodiana section

The dashed line depicts the environmental risk for different number of block valves in the Thratskaro to Kodiana section. In addition the risk associated with the installation of a back up check valve is included.

This assessment again suggests that the reductions in the environmental risk associated with increased reliability of valve closure are offset by the increase in environmental risk associated with the likelihood of leaks from the valve. On this basis it was concluded that there is no benefit in installing an additional check valve in the area.

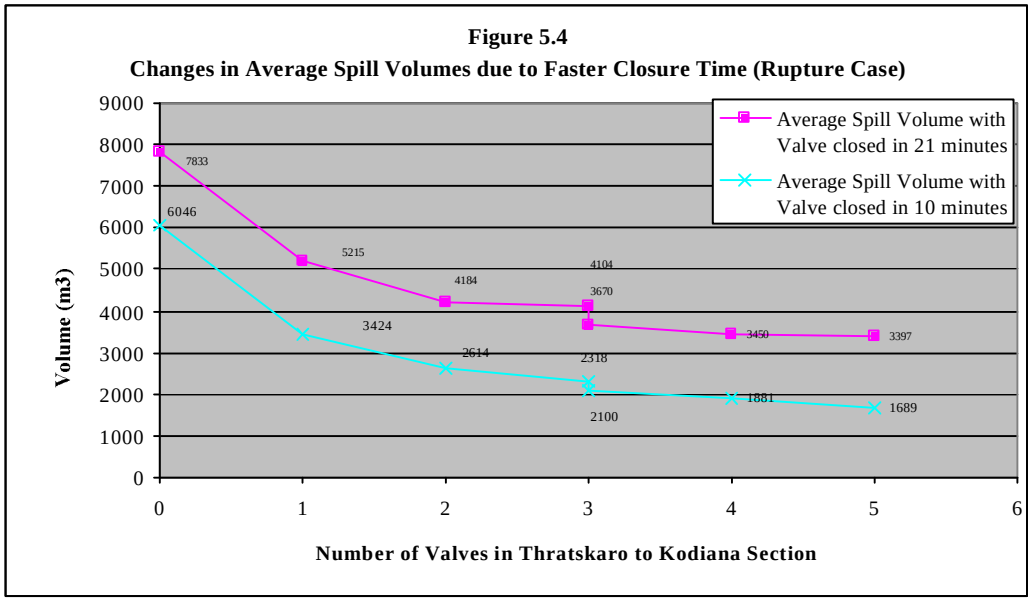
This assessment demonstrates that there is limited benefit associated with the installation of more than three valves in the area. The three valve case is therefore being retained as the refined base case in the Thratskaro to Kodiana section.

Scenario 2 – Model runs assuming 10 minutes from detection to shutdown

Since the ERA publication, additional analysis on shutdown times has been carried out as outlined in Section 3.3.4, and determined that the pumps could be shut down within 2 minutes, whilst the block valves could be closed in 7 minutes, yet still remain within the design pressure limits. (Time to detect a full bore rupture is the same as scenario is 1 minute).

Faster closure times would reduce the volume of oil released in the unlikely event of a full rupture. Preliminary analysis gives an indication of the reduction of spill volumes specific to the Thratskaro to Kodiana section. Figure 5.3 shows the average spill volumes over the Thratskaro to Kodiana section (rupture case) relative to the number of valves. This analysis shows that faster closure times have a significant impact on spill volume reduction (a reduction of approximately 1,700m^3). This analysis also confirms the earlier conclusion that there is no significant benefit to be obtained by the addition of a fourth block valve in the Thratskaro to Kodiana section.

Figure 5-4 Changes in average spill volumes due to faster closure time



5.4.5 Tape in trench

During construction a high visibility tape will be placed in the trench on top of the pipeline which will serves as a warning system to anyone digging in who encounters the tape. The presence of tape will be also outlined in public awareness sessions outlined in Section 3.4.9. Installation of warning tape through the Thratskaro to Kodiana section has been adopted.

5.4.6 Higher grade pipe

This measure is similar to increasing wall thickness and discounted for the same reasons.

5.4.7 Concrete slab or backfill

Deeper burial and protective concrete slabs are considered to be of only limited benefit against third party accidental damage whilst also introducing potentially adverse pipeline maintenance issues. The current burial depth of 1 metre to the top of pipe is considered to be more than adequate in an area not characterized by deep ripping arable farming activities. While such measures may give some additional benefit to mitigate against third party deliberate damage, other security and patrolling measures could be viewed as better methods of delivering risk reduction were and these measures were therefore rejected.

5.4.8 Additional route markers

Additional route markers give higher visibility to pipeline location and are an effective mitigation measure against third party accidental. It can be argued that this measure also increases the visibility to third parties wishing to cause deliberate damage. However, it was deemed preferable to implement this measure.

5.4.9 Increased pipeline patrols

Pipeline patrolling will be carried out for the entire pipeline as outlined in Section 3.4.6. BTC Co has committed to increasing the coverage in the Thratskaro to Kodiana section to daily due to the sensitivity associated with this region.

5.4.10 Groundwater monitoring

Groundwater monitoring wells will be installed in the shallow aquifers that occur in the proximity of the pipeline route at a short distance from the pipeline trench. Periodic sampling and analysis of groundwater will be carried out to detect any crude oil that may have leaked from the pipeline into the trench backfill and thus in groundwater. Any detection of hydrocarbon in groundwater would trigger a detailed investigation of the pipeline trench by means of soil vapour survey or visual inspection to identify the source of hydrocarbon.

5.4.11 Increased public awareness

The public awareness programme which is in place for the entire pipeline is explained in Section 3.4.9. BTC Co has committed to augmenting the programme in the Thratskaro to Kodiana section due to the sensitivity associated with this region.

5.5 OIL SPILL RESPONSE PLANNING SPECIFIC TO THRATSKARO - KODIANA

5.5.1 Acceleration of oil spill response plan development

The oil spill response planning for the Thratskaro – Kodiana area is a subset of the overall oil spill response planning effort going on for the entire pipeline. There is currently initial investigative work being carried out as part of the Oil Spill Response Planning for the Thratskaro – Kodiana section of the pipeline. This has been given priority over general oil spill response planning activities in response to issues raised during consultation with both regulators and other stakeholders. The section below provides and overview of progress to date. The final Oil Spill Response Plan is subject to approval by the Georgian Authorities under the HGA agreement.

BTC Co. has commissioned international consultants to undertake a survey of the Thratskaro - Kodiana section in order to identify potential oil spill scenarios and response (OSR) conditions and to develop recommended strategies for dealing with various scenarios.

The survey was conducted during May 2002 and covered the Thratskaro - Kodiana section, the pipeline route and potential response equipment storage and deployment locations. Particular emphasis was placed in assessment of drainage pathways, streams and receptors in the area.

To minimize the logistical issues the consultants recommended that resources should be provided in the Thratskaro - Kodiana section. The consultants also identified potential locations for storage and deployment of oil spill response equipment in the vicinity of Tsikhisjvari and Androziti.

Given the importance of the Thratskaro - Kodiana section waters, the consultants recommended a solution that would involve establishment of equipment that could be deployed at very short notice. Installation of permanent facilities such as boom anchors was also considered.

Prior to finalizing the findings from the specialist consultants the approach and preliminary findings were discussed with GIOC and their specialist advisors. It is intended that this diabgue will continue as the concepts in the area are further developed.

5.5.2 Oil spill modelling

GIOC and other interested parties have requested further overland spill model analysis is undertaken in the Thratskaro - Kodiana section of the pipeline. On this basis a consultant will be employed to undertake a similar analysis for each kilometre section of the pipeline in the Thratskaro - Kodiana area. This modelling will be undertaken in a similar manner to that described in the ESIA and will form an addendum to the containment manuals for Georgia as outlined in Appendix E Annex V of the ESIA.

5.5.3 Design of a response capability in Thratskaro - Kodiana section

The preliminary assessment described above highlighted the need to undertake further work to enable more definition of possible solutions to provision of Oil Spill Response capability in the area. An internationally recognized consultant has subsequently been employed to undertake this work.

In development of any concepts the consultants will be considering hydrological and practical issues such as:

- Will the method / facility influence the hydrology in the area. In particular will the likelihood of flooding be increased
- What direct environmental impacts will result from the construction of the facility
- How quickly could the system be deployed in the event of an incident
- What spill size can the system contain
- How complex is the system. This has a significant bearing on the reliability of the system and the skills required to effectively deploy the system

These are all important considerations in light of the fact that the system is unlikely to be required during the lifetime of the current inhabitants whilst the impacts of installing the facilities will be real and ongoing.

6 CONCLUSIONS

There has been considerable effort put into the design and operational planning of the pipeline to ensure pipeline integrity is maintained and loss of containment is prevented. The effort has been focused by drawing on historical data which has indicated where pipeline failures have occurred in the past. As part of the operations planning process pipeline integrity measures will be detailed.

In the unlikely event that there is a pipeline leak, there are robust design measures in place to detect the leak and shut down the system thereby minimizing the risk of environmental damage. As with preventative measures, operations planning will continue throughout the next stage to ensure that pipeline surveillance measures compliment the design measures where necessary to ensure adequate detection and prevention of leaks.

Finally, oil spill response planning started in design will continue in the next phase which culminates with the Oil Spill Response Plan (OSRP) which must be approved by the government authorities prior to pipeline start-up.

BTC Co believe that appropriate measures are in place for the entire pipeline to ensure that the risk of loss of containment is minimized and acceptable. Consultants and experts have been employed throughout the design process and to ensure that risks are understood, mitigated and international design and operational best practice is being implemented.

The area of Thratskaro - Kodiana has generated specific concerns through the consultation process as it is an area of significant importance to the Georgian people. Special study of this region has been carried out and extra mitigation measures implemented.

Appendix 7

RESPONSES DATABASE

SUMMARY

Comments from all sources have been collated into a single disclosure database, which the environmental and social consultants have analysed and used to prepare this Addendum. This database covers both BTC and SCP disclosure, as in general feedback was received that related to both pipeline projects.

Every comment was given a unique identification number. Comments on similar issues were given the same code. Please note that no comments were assigned to identification numbers 1 to 30.

Where extensive reports or letters were received from a stakeholder, they have been broken down into individual comments and coded appropriately in the database. Responses have therefore not been provided to these reports as a whole, but rather to the individual issues.

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
31	Private Individual	Employment		Road Show	6.6
32	Private Individual	Community Investment Programme		Road Show	6.13
33	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
34	Private Individual	Employment		Road Show	6.6
35	Private Individual	Employment		Road Show	6.6
36	Private Individual	Employment		Road Show	6.6
37	Private Individual	Safety		Road Show	6.10
38	Private Individual	Land Use Restrictions		Road Show	6.7
39	Private Individual	Land Acquisition and Compensation		Road Show	6.7
40	Private Individual	Employment		Road Show	6.6
41	Private Individual	Community Investment Programme		Road Show	6.13
42	Government and Regulators	Land Acquisition and Compensation		Road Show	6.7
43	Private Individual		PD - Project Design Basis	Road Show	4.1
44	Government and Regulators	Community Investment Programme		Road Show	6.13
45	Private Individual	Employment		Road Show	6.6
46	Private Individual	Land Acquisition and Compensation		Road Show	6.7
47	Private Individual	Land Acquisition and Compensation		Road Show	6.7
48	Government and Regulators	Employment		Road Show	6.6
49	Private Individual	Land Acquisition and Compensation		Road Show	6.7
50	Private Individual	Land Acquisition and Compensation		Road Show	6.7
51	Government and Regulators	Previous Construction Experience		Road Show	6.9
52	Private Individual	Community Relations		Road Show	6.7
53	Private Individual	Land Acquisition and Compensation		Road Show	6.7
54	Government and Regulators	Consultation		Road Show	6.9
55	Private Individual	Land Acquisition and Compensation		Road Show	6.7
56	Private Individual		Route	Road Show	3
57	Government and Regulators	Community Investment Programme		Road Show	6.13
58	Private Individual	Other Compensation		Road Show	6.13
59	Private Individual	Access to Energy		Road Show	6.5
60	Private Individual		PD - Project Schedule	Road Show	4.2
61	Private Individual	Employment		Road Show	6.6
62	Private Individual		Air Quality	Road Show	8.2
63	Private Individual	Community Investment Programme		Road Show	6.13
64	Private Individual	Land Acquisition and Compensation		Road Show	6.7
65	Private Individual	Land Acquisition and Compensation		Road Show	6.7
66	Private Individual		Anthrax	Road Show	5.7
67	Private Individual		Anthrax	Road Show	5.7
68	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
69	Private Individual	Community Investment Programme		Road Show	6.13
70	Private Individual	Community Relations		Road Show	6.9
71	Private Individual	Tariffs		Road Show	6.11
72	Private Individual	Employment		Road Show	6.6
73	Private Individual	Employment		Road Show	6.6
74	Private Individual	Employment		Road Show	6.6
75	Private Individual	Land Acquisition and Compensation		Road Show	6.7
76	Private Individual	Community Investment Programme		Road Show	6.13
77	Private Individual	Employment		Road Show	6.6
78	Private Individual	Employment		Road Show	6.6
79	Private Individual	Community Investment Programme		Road Show	6.13
80	Private Individual	Land Acquisition and Compensation		Road Show	6.7
81	Private Individual	Procurement		Road Show	6.6
82	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
83	Private Individual	Community Investment Programme		Road Show	6.13
84	Private Individual	Employment		Road Show	6.6

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
85	Private Individual	Procurement		Road Show	6.6
86	Private Individual	Community Investment Programme		Road Show	6.13
87	Private Individual	Community Investment Programme		Road Show	6.13
88	Private Individual	Water (social aspects)	Hydrology water supply systems	Road Show	5.8, 6.8
89	Private Individual	Land Acquisition and Compensation		Road Show	6.7
90	Private Individual	Land Acquisition and Compensation		Road show	6.7
91	Private Individual	Land Acquisition and Compensation		Road show	6.7
92	Private Individual	Land Acquisition and Compensation		Road show	6.7
93	Private Individual	Land Acquisition and Compensation		Road show	6.7
94	Private Individual	Land Acquisition and Compensation		Road show	6.7
95	Private Individual	Infrastructure, Transport, Roads		Road show	6.8
96	Private Individual	Community Investment Programme		Road Show	6.13
97	Private Individual	Safety	PD - Ops Control & Maintenance	Road Show	6.10
98	Private Individual	Employment		Road Show	6.6
99	Private Individual	Access to Energy		Road Show	6.5
100	Private Individual	Land Acquisition and Compensation		Road Show	6.7
101	Private Individual	Community Investment Programme	Archaeology & Cultural Heritage	Road show	5.1, 6.13
102	Private Individual	Land Acquisition and Compensation		Road Show	6.7
103	Private Individual	Employment		Road Show	6.6
104	Private Individual	Consultation		Road Show	6.9
105	Private Individual	Employment		Road Show	6.6
106	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
107	Private Individual	Consultation		Road Show	6.9
108	Private Individual	Previous Construction Experience		Road Show	6.9
109	Private Individual	Community Investment Programme		Road Show	6.13
110	Private Individual	Employment		Road Show	6.6
111	Private Individual	Community Investment Programme		Road Show	6.13
112	Private Individual	Land Acquisition and Compensation		Road show	6.7, 6.14
113	Private Individual	Land Acquisition and Compensation		Road show	6.7
114	Private Individual	Land Acquisition and Compensation		Road show	6.7, 6.10
115	Private Individual	Access to Energy		Road Show	6.5
116	Private Individual	Land Acquisition and Compensation		Road show	6.7
117	Private Individual	Other Compensation		Road Show	6.9
118	Private Individual	Access to Energy		Road show	6.5
119	Private Individual		PD - System Construction	Road show	4.2
120	Private Individual	Land Acquisition and Compensation		Road show	6.7
121	Private Individual	Land Acquisition and Compensation		Road show	6.7
122	Private Individual		Route	Road show	3
123	Private Individual	Employment		Road show	6.6
124	Private Individual	Land Acquisition and Compensation		Road show	6.7
125	Private Individual	Employment		Road show	6.6
126	Private Individual	Land Acquisition and Compensation		Road show	6.7
127	Private Individual	Employment		Road show	6.6
128	Private Individual	Land Acquisition and Compensation		Road show	6.7
129	Private Individual	Land Acquisition and Compensation		Road show	6.7
130	Private Individual	Community Investment Programme		Road show	6.13
131	Private Individual	Community Investment Programme		Road show	6.13
132	Private Individual	Access to Energy		Road show	6.5
133	Private Individual	Community Investment Programme		Road Show	6.13

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
134	Private Individual	Employment		Road Show	6.6
135	Private Individual		Forests	Road show	5.11
136	Private Individual	Community Relations		Road Show	6.9
137	Private Individual	Employment		Road show	6.6
138	Private Individual	Access to Energy		Road Show	6.5
139	Private Individual	Employment		Road Show	6.6
140	Private Individual	Employment		Road show	6.6
141	Private Individual	Land Acquisition and Compensation		Road Show	6.7
142	Private Individual		Protected Areas	Road show	5.11, 5.12
143	Private Individual	Land Acquisition and Compensation		Road Show	6.7
144	Private Individual		PD - Testing & Commissioning	Road Show	4.3
145	Private Individual	Community Relations		Road show	6.9
146	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
147	Private Individual		PD - System Construction	Road Show	4.2
148	Private Individual	Land Acquisition and Compensation		Road Show	6.7
149	Private Individual	Community Relations		Road show	6.9
150	Private Individual	Land Acquisition and Compensation		Road Show	6.7
151	Private Individual	Procurement		Road Show	6.6
152	Private Individual	Access to Energy		Road Show	6.5
153	Private Individual	Community Investment Programme		Road Show	6.13
154	Private Individual	International Standards and Legal Compliance (social)		Road show	6.3
155	Private Individual	Tariffs		Road Show	6.11
156	Private Individual	Safety	PD - Ops Control & Maintenance	Road Show	6.10
157	Private Individual	Community Investment Programme		Road Show	6.13
158	Private Individual	Land Acquisition and Compensation		Road Show	6.7
159	Private Individual	Land Acquisition and Compensation		Road Show	6.7
160	Private Individual	Employment		Road Show	6.6
161	Government and Regulators	Community Investment Programme		Road show	6.13
162	Government and Regulators	Community Investment Programme		Road show	6.13
163	NGO	Consultation		Road show	6.9
164	NGO	Consultation		Road show	6.9
165	Private Individual	Community Investment Programme		Road show	6.13
166	Private Individual	ESIA Documentation and Translation		Road show	6.3
167	Private Individual		PD - System Construction	Road Show	4.2
168	Private Individual	Land Acquisition and Compensation		Road Show	6.7
169	Private Individual	Community Investment Programme		Road show	6.13
170	Private Individual	Employment		Road Show	6.6
171	Private Individual	Safety	PD - Ops Control & Maintenance	Road show	6.10
172	Private Individual	Employment		Road Show	6.6
173	Private Individual	Community Investment Programme		Road show	6.13
174	Private Individual	Community Investment Programme		Road Show	6.13
175	Private Individual	Procurement		Road show	6.6
176	Private Individual		PD - Outline of Pipeline & Facilities	Road Show	4.2
177	Private Individual	Water (social aspects)	water environmental	Road Show	5.8, 6.8
178	Private Individual	Community Investment Programme		Road Show	6.13
179	Private Individual		Archaeology & Cultural Heritage	Road Show	5.1
180	Private Individual		Archaeology & Cultural Heritage	Road Show	5.1
181	Private Individual		Archaeology & Cultural Heritage	Road Show	5.1
182	Private Individual	Community Investment Programme		Road Show	6.13
183	Private Individual		Forests	Road show	5.11, 5.12
184	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
185	Private Individual	Access to Energy		Road Show	6.5
186	Private Individual	Community Relations		Road Show	6.9

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
187	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
188	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
189	Private Individual		Construction - Environment	Road show	5.14
190	Private Individual	Procurement		Road Show	6.6
191	Private Individual	Access to Energy		Road Show	6.5
192	Private Individual	Land Acquisition and Compensation		Road show	6.7
193	Private Individual		PD - System Construction	Road Show	4.2
194	Private Individual	Land Acquisition and Compensation		Road show	6.7
195	Private Individual		PD - System Construction	Road Show	4.2
196	Private Individual		PD - Outline of Pipeline & Facilities	Road show	4.2
197	Private Individual		Seismicity	Road Show	5.5
198	Private Individual	Land Acquisition and Compensation		Road show	6.7
199	Private Individual	Community Investment Programme		Road Show	6.13
200	Private Individual	Community Investment Programme		Road show	6.13
201	Private Individual	Access to Energy		Road show	6.5
202	Private Individual	Water (social aspects)		Road show	6.8
203	Private Individual	Tariffs		Road show	6.11
204	Private Individual		PD - Project Design Basis	Road show	4.1
205	Private Individual	Land Use Restrictions		Road show	6.7
206	Private Individual	Procurement		Road show	6.6
207	Private Individual	Land Use Restrictions		Road show	6.7
208	Private Individual	Water (social aspects)		Road show	6.8
209	Private Individual	Community Investment Programme		Road show	6.13
210	Private Individual	Infrastructure, Transport, Roads		Road show	6.8
211	Private Individual	Land Use Restrictions		Road show	6.7
212	Private Individual	Health		Road show	6.10
213	Private Individual	Safety	PD - Ops Control & Maintenance	Road show	6.10
214	Private Individual	Security		Road show	6.10
215	Private Individual	Infrastructure, Transport, Roads		Road show	6.8
216	Private Individual	Employment		Road show	6.6
217	Private Individual	Land Acquisition and Compensation		Road show	6.7
218	Private Individual		PD - Project Schedule	Road show	4.2
219	Private Individual	Employment		Road show	6.6
220	Private Individual	Land Acquisition and Compensation		Road show	6.7
221	Private Individual	Employment		Road show	6.6
222	Private Individual	Other Compensation	Unplanned Events	Road show	5.5, 6.1
223	Private Individual	Community Investment Programme		Road show	6.13
224	Private Individual	Community Investment Programme		Road show	6.13
225	Private Individual	Infrastructure, Transport, Roads		Road show	6.8
226	Private Individual	Community Investment Programme		Road show	6.13
227	Private Individual	Land Use Restrictions		Road show	6.7
228	Private Individual	Community Investment Programme		Road show	6.13
229	Private Individual	Community Investment Programme		Road show	6.13
230	Private Individual	Land Acquisition and Compensation		Road show	6.7
231	Private Individual		PD - System Construction	Road Show	4.2
232	Private Individual	ESIA Documentation and Translation		Road Show	6.3
233	Private Individual	Land Acquisition and Compensation		Road show	6.7
234	Private Individual		PD - Project Design Basis	Road Show	4.1
235	Private Individual	ESIA Documentation and Translation		Road Show	6.3
236	Private Individual	Community Investment Programme		Road show	6.13
237	Private Individual	Employment		Road show	6.6
238	Private Individual	Community Investment Programme		Road show	6.13
239	Private Individual	ESIA Documentation and Translation		Road Show	6.3

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
240	Private Individual	Community Investment Programme		Road show	6.13
241	Private Individual	Community Investment Programme		Road show	6.13
242	Private Individual	Community Relations		Road Show	6.9
243	Private Individual	ESIA Documentation and Translation		Road Show	6.3
244	Private Individual	Procurement		Road show	6.6
245	Government and Regulators	Water (social aspects)	Route	Road Show	5.8, 6.8
246	Private Individual	Employment		Road Show	6.6
247	Private Individual	Community Relations		Road Show	6.9
248	Private Individual	Water (social aspects)	water environmental	Road Show	5.8, 5.14, 6.8
249	Private Individual	Security		Road Show	6.10
250	Private Individual	Land Acquisition and Compensation		Road Show	6.7
251	Private Individual	Employment		Road Show	6.6
252	Government and Regulators	Employment		Road Show	6.6
253	Private Individual	Procurement		Road Show	6.6
254	Private Individual	Employment		Road Show	6.6
255	Private Individual		Seismicity	Road Show	5.5
256	Private Individual	Procurement		Road Show	6.6
257	Private Individual	Employment		Road Show	6.6
258	Private Individual	ESIA Documentation and Translation		Road Show	6.3
259	Number not used				
260	Number not used				
261	Number not used				
262	Government and Regulators		Oil Spill Modelling	Written Response	5.5
263	Government and Regulators	Water (social aspects)	Oil Spill Modelling	Written Response	5.5, 5.8, 6.8
264	Government and Regulators		Oil Spill Modelling	Written Response	5.14
265	Government and Regulators		Oil Spill Modelling	Written Response	5.14
266	Government and Regulators		Oil Spill Modelling	Written Response	5.14
267	Government and Regulators		Oil Spill Modelling	Written Response	5.14
268	Government and Regulators		Oil Spill Modelling	Written Response	5.14
269	Government and Regulators	Water (social aspects)	Oil Spill Modelling	Written Response	4.10, 5.8, 6.8
270	Government and Regulators	Water (social aspects)	Oil Spill Modelling	Written Response	5.5, 6.8
271	Government and Regulators	Water (social aspects)	Oil Spill Modelling	Written Response	5.5, 5.8, 6.8
272	Government and Regulators		Oil Spill Modelling	Written Response	4.10, 5.14
273	Government and Regulators		Oil Spill Modelling	Written Response	5.14
274	Government and Regulators		Oil Spill Modelling	Written Response	5.5
275	Government and Regulators		Oil Spill Modelling	Written Response	5.14
276	Government and Regulators		Oil Spill Modelling	Written Response	5.14
277	Government and Regulators		Oil Spill Modelling	Written Response	5.14
278	Government and Regulators		Flora	Written Response	5.11
279	Government and Regulators		Flora	Written Response	5.11
280	Government and Regulators		Flora	Written Response	5.11
281	Government and Regulators		Forestry	Written Response	5.11
282	Government and Regulators		Forestry	Written Response	5.11
283	Government and Regulators		Flora	Written Response	5.11
284	Government and Regulators		Flora	Written Response	5.11
285	Government and Regulators		Flora and Fauna	Written Response	5.11
286	Government and Regulators		Flora and Fauna	Written Response	5.11
287	Government and Regulators		Flora	Written Response	5.11

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
288	Government and Regulators		Flora	Written Response	5.11
289	Government and Regulators		Flora	Written Response	5.11
290	Government and Regulators		Flora	Written Response	5.11
291	Government and Regulators	Tourism	Flora and Fauna	Written Response	5.11, 6.6
292	Government and Regulators		Flora	Written Response	5.11
293	Government and Regulators		Flora	Written Response	5.11
294	Government and Regulators		Flora	Written Response	5.11
295	Government and Regulators		Flora	Written Response	5.11
296	Government and Regulators		Flora and Fauna	Written Response	5.11
297	Government and Regulators	Tourism	Landscape / Visual impacts	Written Response	5.9, 6.6
298	Government and Regulators		Flora and Fauna	Written Response	5.11
299	Government and Regulators		Flora and Fauna	Written Response	5.11
300	Government and Regulators		Environmental Monitoring	Written Response	8.2
301	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
302	Government and Regulators		HydroGeology / Geomorphology	Written Response	4.10
303	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
304	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
305	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
306	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
307	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5, 4.10
308	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
309	Government and Regulators	Water (social aspects)	HydroGeology / Geomorphology	Written Response	5.5, 5.8, 6.8
310	Government and Regulators	Water (social aspects)	Oil Spill Modelling	Written Response	5.5, 6.8
311	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
312	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
313	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
314	Government and Regulators		Oil Spill Modelling	Written Response	5.14
315	Government and Regulators	Baseline	Oil Spill Modelling	Written Response	5.5, 5.8, 6.4
316	Government and Regulators		Oil Spill Modelling	Written Response	5.14
317	Government and Regulators		Air Quality	Written Response	5.3
318	Government and Regulators		Waste / Waste Water	Written Response	5.6
319	Government and Regulators	Infrastructure, Transport, Roads	Noise	Written Response	5.4, 6.8
320	Government and Regulators		Noise	Written Response	5.4
321	Government and Regulators		Air quality	Written Response	5.3
322	Government and Regulators		Noise	Written Response	5.4
323	Government and Regulators		AGIs - Environment	Written Response	4.5
324	Government and Regulators		Oil Spill Modelling	Written Response	4.1
325	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5, 5.8
326	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
327	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8, 5.14

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
328	Government and Regulators		Oil Spill Modelling	Written Response	5.14
329	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
330	Government and Regulators		Oil Spill Modelling	Written Response	4.1
331	Government and Regulators		Oil Spill Modelling	Written Response	5.14
332	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
333	Government and Regulators		Oil Spill Modelling	Written Response	5.14
334	Government and Regulators		Oil Spill Modelling	Written Response	5.14, 5.8
335	Government and Regulators		Oil Spill Modelling	Written Response	5.8, 5.14
336	Government and Regulators		Oil Spill Modelling	Written Response	5.14
337	Government and Regulators		Oil Spill Modelling	Written Response	5.14
338	Government and Regulators		Oil Spill Modelling	Written Response	5.14
339	Government and Regulators	Tourism	Forests	Other Meeting	5.11, 6.6
340	Government and Regulators		Route	Other Meeting	3
341	Government and Regulators		Forests	Other Meeting	5.11
342	Government and Regulators		Flora and Fauna	Other Meeting	5.11
343	Government and Regulators		HydroGeology / Geomorphology	Other Meeting	5.5
344	Government and Regulators		HydroGeology / Geomorphology	Other Meeting	4.10
345	Government and Regulators		HydroGeology / Geomorphology	Other Meeting	5.5
346	Government and Regulators		Forests	Other Meeting	5.11
347	Government and Regulators	Tourism	Protected Areas	Other Meeting	5.12, 5.11, 5.8, 6.6
348	Government and Regulators		Route	Other Meeting	3
349	Government and Regulators		Flora and Fauna	Other Meeting	5.11
350	Government and Regulators		Forests	Other Meeting	5.11
351	Government and Regulators		Forests	Other Meeting	5.11
352	Government and Regulators	Tourism	Landscape / Visual impacts	Other Meeting	5.9, 6.6
353	Government and Regulators		Protected Areas	Other Meeting	5.12, 4.10
354	Government and Regulators		Protected Areas	Other Meeting	5.12, 5.11
355	Government and Regulators		Forests	Other Meeting	5.11
356	Government and Regulators		Protected Areas	Other Meeting	5.12
357	Government and Regulators		Protected Areas	Other Meeting	5.12, 8.2
358	Government and Regulators		Protected Areas	Other Meeting	5.12
359	Government and Regulators		Protected Areas	Other Meeting	5.12, 5.5
360	Government and Regulators		Protected Areas	Other Meeting	5.12
361	Private Company		HydroGeology / Geomorphology	Other Meeting	5.14
362	Private Company		HydroGeology / Geomorphology	Other Meeting	5.14
363	Private Company	Issues around Borjomi		Other Meeting	5.14
364	Private Company		HydroGeology / Geomorphology	Other Meeting	5.14
365	Independent Report	Issues around Borjomi		Written Response	5.14
366	Government and Regulators		Forests	Written Response	5.11
367	Government and Regulators		Forests	Other Meeting	5.11, 4.10
368	Government and Regulators		Forests	Other Meeting	5.11

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
369	Government and Regulators		Forests	Other Meeting	5.11
370	Government and Regulators	Tourism	Forests	Other Meeting	5.11, 6.6
371	Government and Regulators		Forests	Other Meeting	5.11, 8.2
372	Government and Regulators	Tourism	Forests	Other Meeting	5.11, 6.6
373	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5, 5.8
374	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5, 5.8, 5.14
375	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
376	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
377	Private Individual	Employment		Public Meeting	6.6
378	Private Individual	Health		Public Meeting	6.10
379	Private Individual		Air Quality	Public Meeting	5.3
380	Private Individual		Waste / Waste Water	Public Meeting	4.8
381	Private Individual	Health		Public Meeting	6.10
382	Private Individual		Project Description	Public Meeting	4
383	Private Individual	Health		Public Meeting	6.10
384	Private Individual		Project Description	Public Meeting	4
385	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
386	Private Individual	Safety	Project Description	Public Meeting	6.10,4
387	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
388	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
389	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
390	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
391	Private Individual		Archaeology & Cultural Heritage	Public Meeting	5.1
392	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
393	Private Individual	Security		Public Meeting	6.10
394	Private Individual	Community Investment Programme		Public Meeting	6.13
395	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
396	Government and Regulators	Consultation	Legal Compliance (standards) - environment	Written Response	5.11, 6.9
397	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
398	Government and Regulators	Community Relations		Written Response	6.9
399	Private Individual	Community Investment Programme		Public Meeting	6.13
400	Government and Regulators	Consultation	Legal Compliance (standards) - environment	Written Response	4.1, 6.9
401	Private Individual	Land Acquisition and Compensation		Public Meeting	6.12, 6.7
402	Private Individual	Land Acquisition and Compensation	PD - Project Design Basis	Public Meeting	6.7
403	Private Individual	Employment		Public Meeting	6.6
404	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
405	Private Individual	Land Use Restrictions		Public Meeting	6.7
406	Private Individual		Project Description	Public Meeting	4
407	Private Individual		Project Description	Public Meeting	4
408	Private Individual	Safety	Oil Spill Mitigation	Public Meeting	5.14, 6.1
409	Private Individual		Environmental Investment Programme	Public Meeting	8.2
410	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
411	Private Individual		HydroGeology / Geomorphology	Public Meeting	5.14, 5.8
412	Private Individual	Community Relations		Public Meeting	6.9
413	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
414	NGO	Community Investment Programme		Public Meeting	6.13
415	Private Individual	Employment		Public Meeting	6.6
416	NGO	Employment		Public Meeting	6.6
417	NGO	Land Acquisition and Compensation		Public Meeting	6.7

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
418	NGO	Community Investment Programme		Public Meeting	6.13
419	NGO	Land Acquisition and Compensation		Public Meeting	6.7
420	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
421	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
422	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
423	NGO	Safety		Public Meeting	6.10
424	NGO		Emissions / Dust	Public Meeting	8.2
425	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
426	Private Individual	Community Relations		Public Meeting	6.9
427	NGO	Health		Public Meeting	6.10
428	NGO	ESIA Documentation and Translation		Public Meeting	6.4
429	NGO	Health		Public Meeting	6.10
430	NGO	Infrastructure, Transport, Roads		Public Meeting	6.8
431	NGO		Waste / Waste Water	Public Meeting	4.8
432	Private Individual	Consultation		Public Meeting	6.9
433	NGO	Health		Public Meeting	6.10
434	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
435	NGO	Health		Public Meeting	6.10
436	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
437	NGO	Land Acquisition and Compensation		Public Meeting	6.7
438	NGO	Safety		Public Meeting	6.10
439	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
440	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
441	NGO	Health		Public Meeting	6.10
442	Private Individual	Employment		Public Meeting	6.6
443	Private Individual	Employment		Public Meeting	6.6
444	NGO		Anthrax and Disease	Public Meeting	5.7
445	Private Individual		Project Description	Public Meeting	4
446	Private Individual	Consultation		Public Meeting	6.9
447	NGO	Health		Public Meeting	6.10
448	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
449	Private Individual	Consultation		Public Meeting	6.9
450	Private Individual		Project Description	Public Meeting	4
451	Private Individual	Safety	Project Description	Public Meeting	6.10,4
452	Private Individual	Consultation		Public Meeting	6.9
453	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
454	Private Individual		Archaeology & Cultural Heritage	Public Meeting	5.1
455	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
456	Private Individual	Consultation		Public Meeting	6.9
457	Private Individual	Consultation		Public Meeting	6.9
458	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
459	Private Individual	Consultation		Public Meeting	6.9
460	Private Individual	Employment		Public Meeting	6.6
461	Private Individual	Safety	Project Alternatives	Public Meeting	3.0
462	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
463	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.8, 5.14
464	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
465	Government and Regulators		Oil Spill Modelling	Written Response	5.14
466	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
467	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
468	Private Individual	Employment		Public Meeting	6.6
469	Private Individual	Health		Public Meeting	6.10
470	Government and Regulators		Oil Spill Modelling	Written Response	5.14
471	Private Individual	Security		Public Meeting	6.10
472	Government and Regulators		Oil Spill Modelling	Written Response	5.14

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
473	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
474	Private Individual	Cumulative and Residual Impacts		Public Meeting	6.12
475	Government and Regulators		Geohazards	Written Response	5.8
476	Government and Regulators		Geohazards	Written Response	5.5
477	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
478	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
479	Private Individual	Community Investment Programme		Public Meeting	6.13
480	Private Individual		Environmental Management Plans	Public Meeting	5.8
481	Private Individual	Employment		Public Meeting	6.6
482	Government and Regulators		Geohazards	Written Response	5.5
483	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
484	Private Individual	Employment		Public Meeting	6.6
485	Private Individual		Project Description	Public Meeting	4
486	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
487	Private Individual	Employment		Public Meeting	6.6
488	Private Individual	Employment		Public Meeting	6.6
489	Number not used				
490	Private Individual	Employment		Public Meeting	6.6
491	Private Individual			Public Meeting	6.7
492	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
493	Private Individual		Environmental Monitoring	Public Meeting	8.2
494	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
495	Private Individual		Route	Public Meeting	3
496	Number not used				
497	Private Individual	Monitoring - Social		Public Meeting	8.3
498	Private Individual		Erosion	Public Meeting	3
499	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
500	Private Individual		Construction - Environment	Public Meeting	5.3, 5.6, 5.11
501	Private Individual		Flora and Fauna	Public Meeting	5.11
502	Private Individual	Security		Public Meeting	6.10
503	Private Individual		Project Description	Public Meeting	4
504	Private Individual	Community Investment Programme		Public Meeting	6.13
505	Private Individual	Tariffs		Public Meeting	6.11
506	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
507	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
509	Private Individual		Project Description	Public Meeting	4
510	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
511	Number not used				
512	Government and Regulators		Geohazards	Written Response	5.5
513	Government and Regulators		Landscape / Visual impacts	Written Response	5.9
514	Government and Regulators		Geohazards	Written Response	5.5
515	Government and Regulators		Oil Spill Modelling	Written Response	5.14
516	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
517	Government and Regulators		Oil Spill Modelling	Written Response	5.14
518	Private Individual	Reinstatement	Forests	Public Meeting	5.11
519	Government and Regulators		Route	Written Response	3
520	Government and Regulators		Project Description	Written Response	4
521	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
522	Government and Regulators		Flora and Fauna	Written Response	5.11
523	Private Individual	Safety	Project Description	Public Meeting	6.10,4
524	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
525	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
526	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
527	Private Individual	Employment		Public Meeting	6.6
528	Private Individual	Community Investment Programme		Public Meeting	6.9, 6.14
529	Private Individual		Project Description	Public Meeting	4
530	Private Individual		Project Description	Public Meeting	4
531	Private Individual		Seismicity	Public Meeting	5.5
532	Private Individual		water environmental	Public Meeting	5.14
533	Private Individual		Oil Spill Mitigation	Public Meeting	5.14
534	Private Individual	Tourism		Public Meeting	6.6
535	Private Individual		Environmental Management Plans	Public Meeting	8.2
536	Private Individual	Health		Public Meeting	6.10
537	NGO		Legal Compliance (standards) - environment	NGO Workshop	4
538	Private Individual		Archaeology & Cultural Heritage	Feedback Form	5.1
539	NGO		Project Description	NGO Workshop	4
540	NGO		Project Description	NGO Workshop	4
541	NGO		Project Description	NGO Workshop	4
542	Private Individual	Community Relations		Feedback Form	6.9
543	NGO		Flora and Fauna	NGO Workshop	5.11
544	NGO		HydroGeology / Geomorphology	NGO Workshop	5.5
545	Private Individual	Employment		Public Meeting	6.6
546	Private Individual	Safety	Project Description	Feedback Form	4, 6.10, 8.2
547	NGO		Archaeology & Cultural Heritage	NGO Workshop	5.1
548	Private Individual	Safety	Cumulative Impacts - Environment	Feedback Form	5.11, 7.2, 6.10
549	NGO		Archaeology & Cultural Heritage	NGO Workshop	5.1
550	NGO		Soil	NGO Workshop	5.6
551	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
552	NGO	Water (social aspects)		NGO Workshop	6.8
553	Private Individual	Macroeconomics		Feedback Form	6.3
554	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
555	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
556	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
557	Private Individual	Procurement		Feedback Form	6.6
558	Private Individual	Water (social aspects)		Public Meeting	6.8
559	Private Individual		Flora and Fauna	Public Meeting	5.11
560	Private Individual	Reinstatement	Forests	Public Meeting	5.11, 6.9
561	Private Individual	Employment		Feedback Form	6.6
562	Private Individual		Environmental Management Plans	Public Meeting	8.2
563	Private Individual	Employment		Public Meeting	6.6
564	Private Individual	Employment		Feedback Form	6.6
565	Private Individual	Reinstatement	Forests	Public Meeting	6.9
566	NGO		Flora and Fauna	NGO Workshop	5.11
567	Private Individual	Tariffs		Public Meeting	6.11
568	Private Individual	Employment		Feedback Form	6.6
569	Private Individual		Archaeology & Cultural Heritage	Public Meeting	5.1
570	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
571	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
572	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
573	Private Individual	Community Investment Programme		Public Meeting	6.13
574	Private Individual	Community Investment Programme		Public Meeting	6.13
575	Private Individual		Archaeology & Cultural Heritage	Public Meeting	5.1
576	Private Individual	Community Relations		Public Meeting	6.9
577	Private Individual		Route	Feedback Form	3
578	Private Individual		Seismicity	Public Meeting	6.4
579	Private Individual	Safety	Project Description	Public Meeting	4, 6.10, 8.2
580	Private Individual	Community Investment Programme		Public Meeting	6.13
581	Private Individual		Project Description	Feedback Form	4
582	Private Individual		Route	Public Meeting	5.8

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
583	Private Individual	Employment		Public Meeting	6.6
584	Private Individual	Employment		Public Meeting	6.6
585	NGO		Archaeology & Cultural Heritage	NGO Workshop	5.1
586	NGO		Flora and Fauna	NGO Workshop	5.11
587	NGO		Waste / Waste Water	NGO Workshop	4.8
588	Private Individual		Forests	Public Meeting	5.11
589	Private Individual		Environmental Management Plans	Public Meeting	8
590	Private Individual		Archaeology & Cultural Heritage	Public Meeting	5.1
591	Private Individual	Community Investment Programme		Public Meeting	6.13
592	Private Individual	Access to Energy		Public Meeting	6.5
593	Government and Regulators	Reinstatement	Forests	NGO Workshop	5.11, 6.7
594	Private Individual	Infrastructure, Transport, Roads		Public Meeting	6.8
595	NGO		Archaeology & Cultural Heritage	NGO Workshop	5.1
596	Private Individual	Support for Project		Feedback Form	6.2
597	Private Individual	Employment		Public Meeting	6.6
598	Private Individual	Employment		Feedback Form	6.6
599	Private Individual	Community Investment Programme		Public Meeting	6.13
600	Private Individual	Employment		Public Meeting	6.6
601	Private Individual	Support for Project		Feedback Form	6.2
602	Private Individual		PD - Project Schedule	Public Meeting	4.2
603	Private Individual		Project Description	Public Meeting	4
604	Private Individual	Support for Project		Feedback Form	6.2
605	Private Individual	Security		Public Meeting	6.10
606	Private Individual	Community Relations		Public Meeting	6.9
607	Private Individual	Support for Project		Feedback Form	6.2
608	Private Individual	Safety		Public Meeting	6.10
609	Private Individual	Employment		Feedback Form	6.6
610	Private Individual	Employment		Public Meeting	6.6
611	Private Individual	Support for Project		Feedback Form	6.2
612	Private Individual	Support for Project		Feedback Form	6.2
613	Private Individual		Route	Public Meeting	5.8, 5.14
614	NGO		Landscape / Visual impacts	NGO Workshop	8.2
615	Private Individual	Support for Project		Feedback Form	6.2
616	Private Individual	Community Investment Programme		Public Meeting	6.13
617	NGO		Support for Project	NGO Workshop	4
618	NGO	Land Acquisition and Compensation		NGO Workshop	6.7
619	NGO		Anthrax and Disease	NGO Workshop	5.7
620	Private Individual	Tourism		Public Meeting	6.10, 6.6
621	Private Individual	Support for Project		Feedback Form	6.2
622	NGO		Flora and Fauna	NGO Workshop	5.11
623	Private Individual	Livelihoods		Feedback Form	6.13
624	Private Individual	Water (social aspects)		Public Meeting	6.8
625	Private Individual	Support for Project		Feedback Form	6.2
626	Private Individual	Employment		Public Meeting	6.6
627	Private Individual	Support for Project		Feedback Form	6.2
628	Private Individual	Support for Project		Feedback Form	6.2
629	Private Individual		Archaeology & Cultural Heritage	Public Meeting	5.1
630	Private Individual	Support for Project		Feedback Form	6.2
631	Private Individual	Livelihoods		Feedback Form	6.2
632	Private Individual	Consultation		Public Meeting	6.9
633	Private Individual	Employment		Feedback Form	6.6
634	NGO	Tourism		NGO Workshop	6.6
635	Private Individual	Employment		Feedback Form	6.6
636	Private Individual	Community Investment Programme		Public Meeting	6.13
637	Private Individual	Livelihoods		Feedback Form	6.2
638	Private Individual	Employment		Feedback Form	6.6
639	NGO	Procurement		Public Meeting	6.6
640	Private Individual	Employment		Feedback Form	6.6
641	Private Individual	Support for Project		Feedback Form	6.2
642	Private Individual	Support for Project		Feedback Form	6.2
643	Private Individual	Support for Project		Feedback Form	6.2
644	Private Individual	Employment		Feedback Form	6.6
645	Private Individual	Support for Project		Feedback Form	6.2
646	Private Individual	Employment		Feedback Form	6.6
647	Private Individual	Employment		Public Meeting	6.6
648	NGO		Archaeology & Cultural Heritage	Public Meeting	5.1
649	Private Individual	Employment		Feedback Form	6.6

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
650	Private Individual	ESIA Documentation and Translation		Public Meeting	5.1, 6.6
651	Private Individual	Access to Energy		Feedback Form	6.5
652	Private Individual	Community Investment Programme		Feedback Form	6.13
653	Private Individual	Support for Project		Feedback Form	6.2
654	Private Individual	Employment		Public Meeting	6.6
655	Private Individual		Archaeology & Cultural Heritage	Feedback Form	5.1
656	Private Individual	Tariffs		Public Meeting	6.11
657	Private Individual	Employment		Public Meeting	6.6
658	Private Individual		Construction - Environment	Feedback Form	5.11
659	Private Individual	Employment		Feedback Form	6.6
660	Private Individual		Route	Public Meeting	5.8
661	Private Individual		Climate	Written Response	5.3, 5.2
662	Private Individual	Tourism		Public Meeting	6.6
663	Private Individual	Support for Project		Feedback Form	6.2
664	Private Individual	Land Use Restrictions		Written Response	6.7
665	Private Individual	ESIA Documentation and Translation		Written Response	6.3
666	Private Individual	Employment		Feedback Form	6.6
667	Private Individual	Employment		Written Response	6.6
668	Private Individual		Project Description	Written Response	4
669	Private Individual	Access to Energy		Feedback Form	6.5
670	Private Individual	Land Acquisition and Compensation		Telephone	6.7
671	Private Individual	Land Acquisition and Compensation		Telephone	6.7
672	Private Individual	Safety	Project Description	Feedback Form	6.10,4
673	Private Individual	Consultation		Telephone	6.9
674	Private Individual	Land Acquisition and Compensation		Telephone	6.7
675	Private Individual	Employment		Feedback Form	6.6
676	Private Individual	Land Acquisition and Compensation		Telephone	6.7
677	Private Individual		Project Description	Telephone	4
678	Private Individual	Employment		Telephone	6.6
679	Private Individual	Employment		Telephone	6.6
680	Private Individual		Environmental Management Plans	Feedback Form	8.2
681	Private Individual	Consultation		Telephone	6.9
682	Private Individual		Seismicity	Feedback Form	5.5
683	Private Individual	Employment		Telephone	6.6
684	Private Individual	Procurement		Telephone	6.6
685	Private Individual		AGIs - Environment	Feedback Form	5.4
686	Private Individual	Employment		Telephone	6.6
687	NGO	Community Investment Programme		Feedback Form	6.13
688	Private Individual		Legal Compliance (standards) - environment	Feedback Form	3
689	Private Individual	Livelihoods		Feedback Form	6.2
690	Private Individual	Land Acquisition and Compensation		Telephone	6.7
691	Private Individual		Flora	Feedback Form	5.11
692	Government and Regulators		Fish / fisheries	Feedback Form	5.11
693	Private Individual	Land Acquisition and Compensation		Telephone	6.7
694	Private Individual	Employment		Feedback Form	6.6
695	Private Individual	Land Acquisition and Compensation		Telephone	6.7
696	Private Individual	Support for Project		Feedback Form	6.2
697	Private Individual	Consultation		Telephone	6.9
698	Private Individual	Tariffs		Feedback Form	6.11
699	Private Individual	Security		Feedback Form	6.10
700	Private Individual		PD - Ops Control & Maintenance	Feedback Form	4.5
701	Private Individual	Employment		Feedback Form	6.6
702	Number not used				
703	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
704	NGO		Project Description	Written Response	4
705	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
706	NGO		Project Description	Written Response	4
707	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
708	Private Individual		AGIs - Environment	Written Response	5.3, 5.9
709	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
710	Private Individual		Project Alternatives	Written Response	3
711	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
712	Private Individual		Project Alternatives	Written Response	3
713	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
714	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
715	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
716	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
717	Government and Regulators		HydroGeology / Geomorphology	Written Response	4.10
718	Government and Regulators		HydroGeology / Geomorphology	Written Response	4.10
719	Government and Regulators		HydroGeology / Geomorphology	Written Response	4.10
720	NGO	Procurement		Written Response	6.6
721	NGO	Land Acquisition and Compensation		Written Response	6.7
722	NGO	Procurement		Written Response	6.6
723	NGO	Consultation		NGO workshop	6.9
724	Government and Regulators	Consultation		NGO workshop	6.9
725	NGO	Consultation		NGO workshop	6.9
726	Private Individual	Consultation		NGO workshop	6.9
727	NGO	Consultation		NGO workshop	6.9
728	Private Individual	Consultation		NGO workshop	6.9
729	Private Individual	Consultation		NGO workshop	6.9
730	NGO	Consultation		NGO workshop	6.9
731	NGO	Community Relations		NGO workshop	6.9
732	NGO	Consultation		NGO workshop	6.6
733	NGO	Community Investment Programme		NGO workshop	6.13
734	Government and Regulators	Community Investment Programme		NGO workshop	6.13
735	Government and Regulators	Community Investment Programme		NGO workshop	6.13
736	Government and Regulators		Archaeology & Cultural Heritage	NGO workshop	5.1
737	NGO	Employment		NGO workshop	6.6
738	Government and Regulators	Employment		NGO workshop	6.6
739	Government and Regulators	Employment		NGO workshop	6.6
740	NGO	Community Investment Programme		NGO workshop	6.13
741	Other Organisation	Employment		NGO workshop	6.6
742	Other Organisation	Employment		NGO workshop	6.6
743	Government and Regulators	Community Investment Programme		NGO workshop	6.13
744	Other Organisation	Employment		NGO workshop	6.6
745	NGO	Community Investment Programme		NGO workshop	6.13
746	NGO	Baseline		NGO workshop	6.4
747	NGO	Consultation		NGO workshop	6.9
748	NGO	Health		NGO workshop	6.10
749	NGO	Employment		NGO workshop	6.6
750	NGO	Baseline		NGO workshop	6.4
751	Government and Regulators	Health		NGO workshop	6.10
752	Government and Regulators		Waste / Waste Water	NGO workshop	5.8
753	NGO	Employment		NGO workshop	6.6
754	NGO	Health		NGO workshop	6.10
755	NGO	Employment		NGO workshop	6.6
756	NGO		Environmental Management Plans	NGO workshop	8.2
757	Government and Regulators	Health		NGO workshop	6.10
758	NGO	Consultation		NGO workshop	6.9
759	Government and Regulators		Environmental Management Plans	NGO workshop	8.2
760	NGO	Land Acquisition and Compensation		NGO workshop	6.7
761	Government and Regulators	Other Compensation	Oil Spill Modelling	NGO workshop	4.1, 5.8, 5.14, 6.10
762	NGO	Land Acquisition and Compensation		NGO workshop	6.7

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
763	Government and Regulators	Water (social aspects)		NGO workshop	6.8
764	NGO	Employment		NGO workshop	6.6
765	NGO	Community Relations		NGO workshop	6.9
766	Government and Regulators	Support for Project		NGO workshop	6.2
767	NGO	Data Collection		NGO workshop	6.3
768	NGO	Community Relations		NGO workshop	6.9
769	NGO	Employment		NGO workshop	6.6
770	Independent Report		Support for Project	Written Response	6.2
771	Independent Report		Route	Written Response	3
772	Independent Report		Route	Written Response	3
773	Independent Report		Route	Written Response	3
774	Independent Report		Environmental Management Plans	Written Response	8
775	Independent Report		Route	Written Response	3
776	Independent Report		HydroGeology / Geomorphology	Written Response	5.14
777	Independent Report		Erosion	Written Response	4.4
778	Independent Report		Flora and Fauna	Written Response	5.11
779	Independent Report		water environmental	Written Response	5.5
780	Independent Report		Flora and Fauna	Written Response	5.11
781	Independent Report		Flora and Fauna	Written Response	5.11
782	Independent Report		Route	Written Response	3
783	Independent Report		Archaeology & Cultural Heritage	Written Response	5.1
784	Independent Report		Route	Written Response	3
785	Independent Report	Borjomi	Route	Written Response	3
786	Independent Report		Route	Written Response	3
787	Independent Report		Flora and Fauna	Written Response	5.11
788	Independent Report		Project Description	Written Response	4
789	Independent Report		Project Description	Written Response	4
790	Independent Report		Project Description	Written Response	4
791	Independent Report		Project Description	Written Response	4
792	Independent Report		AGIs - Environment	Written Response	4.5
793	Independent Report		Environmental Management Plans	Written Response	8
794	Independent Report		Construction - Environment	Written Response	4.2
795	Independent Report		Construction - Environment	Written Response	4.2
796	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5, 5.8, 5.14
797	Government and Regulators		Oil Spill Modelling	Written Response	5.14
798	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.9
799	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
800	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
801	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
802	Government and Regulators		HydroGeology / Geomorphology	Written Response	4.10
803	Government and Regulators		Climate	Written Response	5.2
804	Government and Regulators		Forests	Written Response	5.11
805	Government and Regulators		Forests	Written Response	5.11
806	Government and Regulators		HydroGeology / Geomorphology	Written Response	4.10, 5.11
807	NGO		Legal Compliance (standards) - environment	Written Response	4.10
808	Private Individual	Employment		Feedback Form	6.6
809	NGO	Consultation	Environmental Monitoring	Written Response	8.2, 8.3
810	Number not used				
811	Government and Regulators		AGIs - Environment	Written Response	4.5
812	Other Organisation		Anthrax and Disease	Written Response	5.7
813	Other Organisation		Anthrax and Disease	Written Response	5.7
814	Other Organisation		Anthrax and Disease	Written Response	5.7
815	Other Organisation		Anthrax and Disease	Written Response	5.7
816	Private Individual	Community Investment Programme		Written Response	6.13
817	Private Individual	Community Investment Programme		Written Response	6.13
818	Private Individual	Land Acquisition and Compensation		Telephone	6.7
819	Number not used				

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
820	NGO		Oil Spill Modelling	Written Response	4.9
821	NGO		Oil Spill Modelling	Written Response	4.9
822	NGO		Unplanned Events	Written Response	4.9
823	NGO		Oil Spill Modelling	Written Response	4.9
824	NGO		Oil Spill Modelling	Written Response	4.9
825	NGO		Oil Spill Modelling	Written Response	4.9
826	NGO		Oil Spill Modelling	Written Response	4.9
827	NGO		Oil Spill Modelling	Written Response	4.9
828	NGO		Oil Spill Modelling	Written Response	4.9
829	NGO		Oil Spill Modelling	Written Response	5.14
830	NGO		Geohazards	Written Response	5.5
831	NGO		Geohazards	Written Response	5.5
832	NGO		Construction - Environment	Written Response	4.5
833	NGO		Construction - Environment	Written Response	4.5
834	NGO		Soil	Written Response	5.6
835	NGO		Geohazards	Written Response	5.5
836	NGO		Unplanned Events	Written Response	4.8
837	NGO		Surface Water (rivers and lakes)	Written Response	5.5, 5.14
838	NGO		Surface Water (rivers and lakes)	Written Response	5.5, 5.14
839	NGO		Approach & Methodology	Written Response	4.1
840	NGO		HydroGeology / Geomorphology	Written Response	5.8
841	NGO		Soil	Written Response	5.6
842	NGO		Oil Spill Mitigation	Written Response	5.14
843	NGO		Erosion	Written Response	4.4
844	NGO		Geohazards	Written Response	5.5
845	NGO		Geohazards	Written Response	5.5
846	NGO		Geohazards	Written Response	5.5
847	NGO		Geohazards	Written Response	5.5
848	NGO		Geohazards	Written Response	5.5
849	NGO		Oil Spill Mitigation	Written Response	5.14
850	NGO	Community Relations		Written Response	6.9
851	NGO	Community Relations		Written Response	8.3
852	Number not used				
853	NGO		Protected Areas	Written Response	5.12
854	NGO		Flora and Fauna	Written Response	5.11
855	NGO		Protected Areas	Written Response	5.12, 5.14
856	NGO		Forests	Written Response	5.11
857	NGO		Flora	Written Response	5.11
858	NGO		Cumulative Impacts - Environment	Written Response	5.11, 7.2
859	Number not used				
860	NGO		Forests	Written Response	5.11
861	Number not used				
862	Number not used				
863	NGO		PD - Project Design Basis	Written Response	4.1
864	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
865	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
866	NGO		PD - Reinstate & Erosion	Written Response	4.4
867	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
868	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
869	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
870	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
871	NGO		PD - Project Design Basis	Written Response	4.1
872	Government and Regulators		Climate	Written Response	5.2
873	NGO		PD - Wastes & Emissions	Written Response	4.5
874	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
875	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
876	NGO		PD - System Construction	Written Response	4.2
877	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
878	NGO		PD - System Construction	Written Response	4.2
879	NGO		PD - Wastes	Written Response	4.8
880	Government and Regulators		Oil Spill Modelling	Written Response	4.9
881	NGO		PD - System Construction	Written Response	4.2
882	NGO		PD - System Construction	Written Response	4.2

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
883	Government and Regulators		Oil Spill Modelling	Written Response	5.5
884	NGO		PD - System Construction	Written Response	4.2
885	NGO		PD - System Construction	Written Response	4.2
886	Government and Regulators		Oil Spill Modelling	Written Response	5.14
887	NGO		PD - Wastes	Written Response	4.8
888	Government and Regulators		Oil Spill Modelling	Written Response	4.9
889	NGO		PD - Project Schedule	Written Response	4.2
890	Government and Regulators		Oil Spill Modelling	Written Response	5.14
891	NGO		Construction - Environment	Written Response	4.5
892	Government and Regulators		Oil Spill Mitigation	Written Response	4.1, 5.14
893	NGO		PD - Testing & Commissioning	Written Response	4.3
894	NGO		PD - System Construction	Written Response	4.2
895	NGO		PD - System Construction	Written Response	4.2
896	NGO		PD - System Construction	Written Response	4.2
897	NGO		PD - Ops Control & Maintenance	Written Response	4.5
898	NGO		PD - Reinstate & Erosion	Written Response	4.4
899	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
900	NGO		PD - System Construction	Written Response	4.2
901	NGO		PD - System Construction	Written Response	4.2
902	NGO		PD - Wastes & Emissions	Written Response	4.5
903	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
904	NGO		PD - Reinstate & Erosion	Written Response	4.4
905	Government and Regulators		Air Quality	Written Response	5.3
906	Other Organisation	Macroeconomics		Written Response	6.3
907	Government and Regulators	ESIA Documentation and Translation		Written Response	6.3
908	Other Organisation	Data Collection		Written Response	6.3
909	Government and Regulators	Employment		Written Response	6.6
910	Other Organisation	Data Collection		Written Response	6.4
911	Other Organisation	Baseline		Written Response	6.4
912	Other Organisation	Demography and Ethnicity		Written Response	6.9
913	Government and Regulators	Community Investment Programme		Written Response	6.13
914	Government and Regulators	Employment		Written Response	6.6
915	Other Organisation	Baseline		Written Response	6.4
916	Government and Regulators	Employment		Written Response	6.6
917	Other Organisation	Land Acquisition and Compensation		Written Response	6.7, 6.6
918	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
919	Other Organisation	Employment		Written Response	6.6
920	Government and Regulators	Consultation		Written Response	6.9
921	Other Organisation	Employment		Written Response	6.6
922	Government and Regulators	Consultation		Written Response	6.9
923	Other Organisation	Employment		Written Response	6.9
924	Government and Regulators	Health		Written Response	6.10
925	Other Organisation	Infrastructure, Transport, Roads		Written Response	6.8
926	Government and Regulators	Community Investment Programme		Written Response	6.13
927	Government and Regulators	Employment		Written Response	6.6
928	Other Organisation	General Construction Queries		Written Response	6.9
929	Government and Regulators	Employment		Written Response	6.6
930	Other Organisation	Data Collection		Written Response	6.3
931	Government and Regulators	Employment		Written Response	6.6
932	Other Organisation	Monitoring - Social		Written Response	8.3
933	Government and Regulators	Employment		Written Response	6.9
934	Other Organisation	Employment		Written Response	6.6

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
935	Government and Regulators	Employment		Written Response	6.6
936	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
937	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
938	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
939	Independent Report	Employment		Written Response	6.6
940	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
941	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
942	Other Organisation	Access to Energy		Written Response	6.8
943	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
944	Other Organisation	Health		Written Response	6.10
945	Other Organisation	Community Investment Programme		Written Response	6.13
946	Other Organisation	Baseline		Written Response	6.4, 6.3
947	Independent Report	Community Investment Programme		Written Response	6.7
948	Other Organisation	Data Collection		Written Response	6.3
949	Independent Report	Tourism		Written Response	6.6
950	Other Organisation	Data Collection		Written Response	6.3
951	Other Organisation	Consultation		Written Response	6.9
952	Independent Report	Water (social aspects)		Written Response	6.8
953	Other Organisation	Demography and Ethnicity		Written Response	6.9
954	Other Organisation	Infrastructure, Transport, Roads		Written Response	6.8
955	Independent Report	Community Relations		Written Response	6.10
956	Other Organisation	Consultation		Written Response	6.9
957	Other Organisation	Data Collection		Written Response	6.3
958	Other Organisation		Forests	Written Response	5.11
959	Independent Report	Employment		Written Response	6.6
960	Other Organisation	Livelihoods		Written Response	6.4
961	Independent Report	Procurement		Written Response	6.6
962	Other Organisation	Community Investment Programme		Written Response	6.13
963	Independent Report	Community Investment Programme		Written Response	6.13
964	Other Organisation		Waste / Waste Water	Written Response	4.8
965	Independent Report	Community Investment Programme		Written Response	6.13
966	Other Organisation	International Standards and Legal Compliance (social)		Written Response	6.11
967	Other Organisation	Data Collection		Written Response	6.3
968	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
969	Other Organisation	Community Relations		Written Response	6.6
970	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
971	Other Organisation	Community Relations		Written Response	6.9
972	Other Organisation	Community Investment Programme		Written Response	6.13
973	Independent Report	Infrastructure, Transport, Roads		Written Response	6.8
974	Other Organisation	Community Investment Programme		Written Response	6.13
975	Other Organisation	Employment		Written Response	6.6
976	Other Organisation	Community Relations		Written Response	6.9
977	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
978	NGO	Employment		Written Response	6.6
979	NGO	Community Investment Programme		Written Response	6.13
980	NGO	Employment		Written Response	6.6
981	NGO	Employment		Written Response	6.6
982	Independent Report	Community Investment Programme		Written Response	6.13
983	NGO	Data Collection		Written Response	6.3
984	NGO	Demography and Ethnicity		Written Response	6.3
985	Independent Report	Land Acquisition and Compensation		Written Response	6.7
986	NGO		Archaeology & Cultural Heritage	Written Response	5.1
987	NGO		Archaeology & Cultural Heritage	Written Response	5.5
988	NGO	Consultation		Written Response	6.9
989	Independent Report	ESIA Documentation and Translation		Written Response	6.3

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
990	NGO		Landscape / Visual impacts	Written Response	5.11
991	Independent Report	Consultation		Written Response	6.7
992	Independent Report	Monitoring - Social		Written Response	8.3
993	Independent Report	Community Investment Programme		Written Response	6.13
994	Independent Report	Monitoring - Social		Written Response	8.3
995	NGO	General Construction Queries	PD - Reinstate & Erosion	Written Response	4.4
996	NGO	Consultation		Written Response	6.9
997	NGO	Community Investment Programme		Written Response	6.13
998	NGO	Tourism		Written Response	6.6
999	NGO	Community Investment Programme		Written Response	6.13
1000	NGO	Land Acquisition and Compensation		Written Response	6.7
1001	NGO	Employment		Written Response	6.6
1002	NGO	Community Investment Programme	Waste / Waste Water	Written Response	6.13
1003	NGO	Baseline		Written Response	6.4, 6.6
1004	NGO	Community Investment Programme		Written Response	6.13
1005	NGO	Baseline		Written Response	6.4
1006	NGO	Land Acquisition and Compensation		Written Response	6.7
1007	NGO	Baseline		Written Response	6.4
1008	NGO	Access to Energy		Written Response	6.8
1009	NGO	Baseline		Written Response	6.4
1010	NGO	Baseline		Written Response	6.4
1011	NGO	Employment		Written Response	6.6
1012	NGO	ESIA Documentation and Translation	Methodology & Approach	Written Response	4.10, 6.3
1013	NGO	Data Collection	Methodology & Approach	Written Response	4.10, 6.3
1014	NGO	Employment		Written Response	6.6
1015	NGO	Baseline	Methodology & Approach	Written Response	4.10, 6.4
1016	NGO	Consultation		Written Response	6.9
1017	NGO	Community Investment Programme		Written Response	6.13
1018	NGO	Consultation		Written Response	6.9
1019	NGO	Monitoring - Social		Written Response	8.3
1020	NGO	General Construction Queries	Construction - Environment	Written Response	4.10, 5.11, 6.12
1021	NGO	Land Acquisition and Compensation		Written Response	6.7
1022	NGO	Issues around Borjomi		Written Response	5.14
1023	NGO	ESIA Documentation and Translation		Written Response	6.3
1024	NGO	ESIA Documentation and Translation		Written Response	6.3
1025	NGO	Water (social aspects)		Written Response	6.8
1026	NGO	Management Plans	Environmental Management Plans	Written Response	8.2, 8.3
1027	NGO	General Construction Queries		Written Response	6.9
1028	NGO	General Construction Queries		Written Response	6.9
1029	NGO	General Construction Queries	Construction - Environment	Written Response	6.9, 8.2
1030	NGO	General Construction Queries	Construction - Environment	Written Response	6.9
1031	NGO	Cumulative and Residual Impacts		Written Response	6.10, 6.12
1032	NGO	Cumulative and Residual Impacts		Written Response	6.12
1033	NGO	Health		Written Response	6.10
1034	NGO	Baseline		Written Response	6.10
1035	NGO	Water (social aspects)		Written Response	6.8
1036	NGO	Management Plans		Written Response	8.3
1037	NGO	Cumulative and Residual Impacts	Cumulative Impacts - Environment	Written Response	5.11, 7.2, 6.12
1038	NGO	Access to Energy		Written Response	6.8
1039	NGO	Land Acquisition and Compensation		Written Response	6.7
1040	NGO	Land Acquisition and Compensation		Written Response	6.7
1041	NGO	Community Investment Programme		Written Response	6.13
1042	NGO	Borjomi	Oil Spill Mitigation	Written Response	5.14
1043	NGO	Management Plans	Environmental Management Plans	Written Response	8.2, 8.3

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
1044	NGO	Monitoring - Social	Environmental Management Plans	Written Response	8.2, 8.3
1045	NGO	Monitoring - Social		Written Response	8.3
1046	NGO	Monitoring - Social		Written Response	6.8,6.13
1047	NGO	Monitoring - Social		Written Response	8.3
1048	NGO		Residual impacts - Environment	Written Response	4.10
1049	NGO		PD - Risk Assessment	Written Response	4.9
1050	NGO	Management plans		Written Response	8.3
1051	NGO	Monitoring - Social		Written Response	8.3
1052	NGO	Infrastructure, Transport, Roads		Written Response	6.8
1053	NGO	Water (social aspects)		Written Response	6.8
1054	NGO	Monitoring - Social	Environmental Management Plans	Written Response	8
1055	NGO	Procurement		Written Response	6.6
1056	NGO	Monitoring - Social	Environmental Management Plans	Written Response	8.2, 8.3
1057	NGO	Management plans	Environmental Management Plans	Written Response	8.3
1058	NGO	Data Collection		Written Response	6.3
1059	NGO	Consultation		Written Response	6.9
1060	NGO	Consultation		Written Response	6.9
1061	NGO		Flora and Fauna	Written Response	5.11, 6.4
1062	NGO	Data Collection		Written Response	6.3
1063	NGO	Management plans	Environmental Management Plans	Written Response	8.2, 8.3
1064	NGO	Consultation		Written Response	6.9
1065	NGO	Consultation		Written Response	6.9
1066	NGO	Consultation		Written Response	6.9
1067	NGO	Consultation		Written Response	6.9
1068	NGO	Consultation		Written Response	6.9
1069	NGO	Consultation		Written Response	6.9
1070	NGO	Consultation		Written Response	6.9
1071	NGO	Consultation		Written Response	6.9
1072	NGO	Management plans		Written Response	8.3
1073	Independent Report	Employment		Written Response	6.4
1074	Government and Regulators	Access to Energy		Written Response	6.5
1075	Private Individual		Forests	Feedback Form	5.11
1076	Private Individual		PD - Reinstate & Erosion	Feedback Form	4.4
1077	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
1078	Private Individual		Erosion	Feedback Form	5.6, 5.11
1079	Private Individual		Erosion	Feedback Form	4.4
1080	Private Individual		Soil	Feedback Form	5.6, 8.2
1081	Private Individual		AGIs - Environment	Feedback Form	5.14
1082	Private Individual		Surface Water (rivers and lakes)	Feedback Form	5.14
1083	Private Individual	Project Support	Project Description	Feedback Form	4, 6.2
1084	Private Individual	Support for Project		Feedback Form	6.2
1085	Private Individual	Support for Project		Feedback Form	6.3
1086	Private Individual	Security	Environmental Security	Feedback Form	6.10
1087	Private Individual		PD - System construction	Feedback Form	4.2
1088	Private Individual		Operation - Environment	Feedback Form	4.5
1089	Private Individual		Unplanned Events	Feedback Form	5.11, 7.2
1090	Private Individual		Seismicity	Feedback Form	5.5
1091	Private Individual		PD - Project Design Basis	Feedback Form	4.1
1092	Private Individual		HydroGeology / Geomorphology	Feedback Form	5.8
1093	Private Individual	Community Investment Programme		Feedback Form	6.13
1094	Private Individual	Community Investment Programme		Feedback Form	6.13
1095	Private Individual	Other Compensation		Feedback Form	6.13
1096	Private Individual	Access to Energy		Feedback Form	6.5
1097	Private Individual	Community Investment Programme		Feedback Form	6.13
1098	Private Individual		AGIs - Environment	Feedback Form	4.5
1099	Private Individual	Support for Project		Feedback Form	6.2
1100	Private Individual	Safety		Feedback Form	6.10
1101	Private Individual	Security		Feedback Form	6.10
1102	Private Individual		Archaeology & Cultural Heritage	Feedback Form	5.1
1103	Private Individual	Support for Project		Feedback Form	6.2
1104	Private Individual		Flora and Fauna	Feedback Form	5.11
1105	Private Individual		Archaeology & Cultural Heritage	Feedback Form	5.1
1106	Private Individual	Support for Project		Feedback Form	6.2
1107	Private Individual	Employment		Feedback Form	6.6
1108	Private Individual	Employment		Feedback Form	6.6

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1109	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1110	Private Individual	Reinstatement		Feedback Form	6.9
1111	Private Individual		Legal Compliance (standards) - environment	Feedback Form	4.5
1112	Private Individual	Employment		Feedback Form	6.6
1113	Private Individual	Employment		Feedback Form	6.6
1114	Private Individual	Safety		Feedback Form	6.10
1115	Private Individual	Support for Project		Feedback Form	6.2
1116	Private Individual	Other Compensation	Flora and Fauna	Feedback Form	5.11, 6.13
1117	Private Individual		Archaeology & Cultural Heritage	Feedback Form	5.1
1118	Private Individual	Support for Project		Feedback Form	6.2
1119	NGO		Legal Compliance (standards) - environment	Written Response	8.2
1120	NGO		Oil Spill Modelling	Written Response	5.14
1121	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1122	Private Individual	Access to Energy		Feedback Form	6.5
1123	Private Individual	Community Investment Programme		Feedback Form	6.13
1124	Private Individual	Employment		Feedback Form	6.6
1125	Private Individual	Employment		Feedback Form	6.6
1126	Private Individual	Other Compensation		Feedback Form	6.13
1127	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1128	Private Individual	Employment		Feedback Form	6.6
1129	Private Individual	Other Compensation		Feedback Form	6.7
1130	Private Individual	Employment		Feedback Form	6.6
1131	Private Individual	Employment		Feedback Form	6.6
1132	Private Individual	Other Compensation		Feedback Form	6.13
1133	Private Individual	Employment		Feedback Form	6.6
1134	Private Individual	Employment		Feedback Form	6.6
1135	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7, 6.8
1136	Private Individual	Employment		Feedback Form	6.6
1137	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1138	Private Individual	Employment		Feedback Form	6.6
1139	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1140	Private Individual	Employment		Feedback Form	6.6
1141	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1142	Private Individual	Community Investment Programme		Feedback Form	6.13
1143	Private Individual	Employment		Feedback Form	6.6
1144	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1145	Private Individual	Community Investment Programme		Feedback Form	6.13
1146	Private Individual	Community Investment Programme		Feedback Form	6.13
1147	Private Individual	Community Investment Programme		Feedback Form	6.13
1148	Private Individual	Employment		Feedback Form	6.6
1149	Private Individual	Government Relations		Feedback Form	6.6
1150	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1151	Private Individual	Access to Energy		Feedback Form	6.5
1152	Private Individual	Employment		Feedback Form	6.10
1153	Private Individual	Community Investment Programme		Feedback Form	6.13
1154	Private Individual	Employment		Feedback Form	6.6
1155	Private Individual	Community Investment Programme		Feedback Form	6.13
1156	Private Individual	Community Investment Programme		Feedback Form	6.13
1157	Private Individual	Community Investment Programme	Noise	Feedback Form	5.4, 6.13
1158	Private Individual	Employment		Feedback Form	6.6
1159	Private Individual	Constuction Camps and Pipeyards		Feedback Form	6.9
1160	Private Individual	Community Investment Programme		Feedback Form	6.13
1161	Private Individual		PD - Reinstate & Erosion	Feedback Form	4.4
1162	Private Individual	Community Investment Programme		Feedback Form	6.13
1163	Private Individual	Employment		Feedback Form	6.6
1164	Private Individual	Employment		Feedback Form	6.6
1165	Private Individual	Employment		Feedback Form	6.6

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1166	Private Individual	Procurement		Feedback Form	6.6
1167	Private Individual	Other Compensation		Feedback Form	6.13
1168	Private Individual		Route	Feedback Form	6.7
1169	Private Individual	Employment		Feedback Form	6.6
1170	Private Individual		Construction - Environment	Feedback Form	4.5
1171	Private Individual	Procurement		Feedback Form	6.6
1172	Private Individual	Employment		Feedback Form	6.6
1173	Private Individual	Community Investment Programme		Feedback Form	6.13
1174	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1175	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1176	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1177	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1178	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1179	Private Individual	Procurement		Feedback Form	6.6
1180	Private Individual	Community Investment Programme		Feedback Form	6.13
1181	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1182	Private Individual	Employment		Feedback Form	6.6
1183	Private Individual	Community Investment Programme	Noise	Feedback Form	5.4, 6.13
1184	Private Individual	Community Investment Programme		Feedback Form	6.13
1185	Private Individual	Water (social aspects)	water environmental	Feedback Form	5.8, 6.8
1186	Private Individual	Other Compensation		Feedback Form	6.13
1187	Private Individual	Community Investment Programme		Feedback Form	6.13
1188	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
1189	Private Individual	Consultation		Feedback Form	6.9
1190	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1191	Private Individual	Government Relations		Feedback Form	6.5
1192	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1193	Private Individual	Water (social aspects)	water environmental	Feedback Form	5.8, 6.8
1194	Private Individual	Community Investment Programme		Feedback Form	6.13
1195	Private Individual	Support for Project		Feedback Form	6.2
1196	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1197	Private Individual	Employment		Feedback Form	6.6
1198	Private Individual	Other Compensation		Feedback Form	6.7, 6.9
1199	Private Individual	Other Compensation		Feedback Form	6.13
1200	Private Individual	Access to Energy		Feedback Form	6.5
1201	Private Individual	Constuction Camps and Pipeyards		Feedback Form	6.9
1202	Private Individual	Employment		Feedback Form	6.6
1203	Private Individual	Employment		Feedback Form	6.6
1204	Private Individual	Employment		Feedback Form	6.6
1205	Private Individual	Access to Energy		Feedback Form	6.5
1206	Private Individual	Employment		Feedback Form	6.6
1207	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1208	Private Individual	Other Compensation		Feedback Form	6.10
1209	Private Individual		Air Quality	Feedback Form	5.3
1210	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1211	Private Individual	Procurement		Feedback Form	6.6
1212	Private Individual	Safety		Feedback Form	6.10
1213	Private Individual	Land Use Restrictions	PD - Reinstate & Erosion	Feedback Form	4.4
1214	Private Individual		Route	Feedback Form	3
1215	Private Individual	Employment		Feedback Form	6.6
1216	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1217	Private Individual	Safety		Feedback Form	6.10
1218	Private Individual	Employment		Feedback Form	6.6
1219	Private Individual	Employment		Feedback Form	6.6
1220	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1221	Private Individual	Employment		Feedback Form	6.6
1222	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1223	Private Individual	Community Relations		Feedback Form	6.9

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1224	Private Individual	Safety		Feedback Form	6.10
1225	Private Individual	Unplanned events		Feedback Form	6.9
1226	Private Individual		Legal Compliance (standards) - environment	Feedback Form	8.2
1227	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1228	Private Individual	Access to Energy		Feedback Form	6.5
1229	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1230	Private Individual	Employment		Feedback Form	6.6
1231	Private Individual	Other Compensation		Feedback Form	6.13
1232	Private Individual	ESIA Documentation and Translation		Feedback Form	6.3
1233	Private Individual	Community Investment Programme		Feedback Form	6.13
1234	Private Individual	Other Compensation	PD - Reinstate & Erosion	Feedback Form	4.4
1235	Private Individual		Fish / fisheries	Feedback Form	5.11
1236	Private Individual	Other Compensation		Feedback Form	6.13
1237	Private Individual		Forests	Feedback Form	5.11
1238	Private Individual	Employment		Feedback Form	6.6
1239	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1240	NGO		Oil Spill Modelling	Written Response	5.14
1241	NGO		Oil Spill Modelling	Written Response	5.14
1242	NGO	Security		Written Response	6.10
1243	NGO		Route	Written Response	3
1244	Government and Regulators	Community Investment Programme		Written Response	6.13
1245	Government and Regulators	Community Investment Programme		Written Response	6.13
1246	Government and Regulators	Community Investment Programme		Written Response	6.13
1247	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.8
1248	Government and Regulators	Community Investment Programme		Written Response	6.13
1249	Government and Regulators	Community Investment Programme		Written Response	6.13
1250	Government and Regulators	Procurement		Written Response	6.6
1251	Government and Regulators	Procurement		Written Response	6.6
1252	Government and Regulators	Community Investment Programme		Written Response	6.13
1253	Government and Regulators	Procurement		Written Response	6.6
1254	Independent Report	Data Collection		Written Response	6.3
1255	Independent Report	Macroeconomics		Written Response	6.3
1256	Independent Report	Baseline		Written Response	6.4
1257	Independent Report	Data Collection		Written Response	6.3
1258	Independent Report	Macroeconomics		Written Response	6.3
1259	Independent Report	Employment		Written Response	6.6
1260	Independent Report	Employment		Written Response	6.6
1261	Independent Report	Employment		Written Response	6.6
1262	Independent Report	Employment		Written Response	6.6
1263	Independent Report	Employment		Written Response	6.9
1264	Independent Report	Employment		Written Response	6.6
1265	Independent Report	Land Acquisition and Compensation		Written Response	6.7
1266	Independent Report	Land Acquisition and Compensation		Written Response	6.7
1267	Independent Report	Infrastructure, Transport, Roads		Written Response	6.8
1268	Independent Report	Demography and Ethnicity		Written Response	6.9
1269	Independent Report	Demography and Ethnicity		Written Response	6.9
1270	Independent Report	Baseline		Written Response	6.4
1271	Independent Report	Employment		Written Response	6.6
1272	Independent Report	Employment		Written Response	6.6
1273	Independent Report	Employment		Written Response	6.6
1274	Independent Report	Land Acquisition and Compensation		Written Response	6.7
1275	Independent Report	Baseline		Written Response	6.4
1276	Independent Report	Employment		Written Response	6.6
1277	Independent Report	Employment		Written Response	6.6
1278	Independent Report	Monitoring - Social		Written Response	8.3
1279	Independent Report	Community Relations		Written Response	6.9
1280	Independent Report	Employment		Written Response	6.6
1281	Independent Report	Land Acquisition and Compensation		Written Response	6.7
1282	Independent Report	Community Relations		Written Response	6.9
1283	Private Individual	Tariffs		Feedback Form	6.11

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1284	Private Individual	Land Use Restrictions		Feedback Form	6.7
1285	Private Individual		Cumulative Impacts - Environment	Feedback Form	7.2
1286	Government and Regulators	Baseline		Written Response	6.4
1287	Government and Regulators	Management Plans		Written Response	8.3
1288	Government and Regulators	Management Plans		Written Response	8.3
1289	Government and Regulators		Route	Written Response	3
1290	Government and Regulators	Consultation		Written Response	6.9
1291	Government and Regulators		Project Alternatives	Written Response	3
1292	Government and Regulators		Route	Written Response	3
1293	Government and Regulators	ESIA Documentation and Translation		Written Response	6.3
1294	Government and Regulators		Route	Written Response	3
1295	Government and Regulators		Legal Compliance (standards) - environment	Written Response	5.12
1296	Government and Regulators		PD - Project Design Basis	Written Response	8.2
1297	Government and Regulators	General Construction Queries		Written Response	6.9
1298	Government and Regulators		Cumulative Impacts - Environment	Written Response	5.14
1299	Government and Regulators	Issues around Borjomi		Written Response	5.14
1300	Government and Regulators	Tourism		Written Response	5.14, 6.6
1301	Government and Regulators		Route	Written Response	5.14
1302	Government and Regulators	Issues around Borjomi		Written Response	5.14
1303	Government and Regulators		Environmental Management Plans	Written Response	8.2
1304	Government and Regulators	Management Plans		Written Response	8.3
1305	Government and Regulators	Management Plans		Written Response	8.3
1306	Government and Regulators	Monitoring - Social		Written Response	8.3
1307	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
1308	Government and Regulators	Monitoring - Social		Written Response	8.3
1309	Government and Regulators	Management Plans		Written Response	8.3
1310	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
1311	Government and Regulators	ESIA Documentation and Translation	Construction - Environment	Written Response	6.11
1312	Government and Regulators	Health		Written Response	6.10
1313	Government and Regulators	Health		Written Response	6.10
1314	Government and Regulators	Baseline		Written Response	6.4
1315	Government and Regulators	Health		Written Response	6.10
1316	Government and Regulators	Baseline		Written Response	6.4
1317	Government and Regulators	Water (social aspects)		Written Response	6.4, 6.8
1318	Government and Regulators	Water (social aspects)		Written Response	6.4
1319	Government and Regulators		PD - System construction	Written Response	4.2
1320	Government and Regulators		Anthrax	Written Response	5.7
1321	Government and Regulators	ESIA Documentation and Translation		Written Response	6.9
1322	Government and Regulators	Consultation		Written Response	6.9
1323	Government and Regulators	Consultation		Written Response	6.9
1324	Government and Regulators	Consultation		Written Response	6.9

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1325	Government and Regulators	Consultation		Written Response	6.9
1326	Government and Regulators	Consultation		Written Response	6.9
1327	Government and Regulators	Consultation		Written Response	6.9
1328	Government and Regulators	Consultation		Written Response	6.9
1329	Government and Regulators	Consultation		Written Response	6.9
1330	Government and Regulators	Consultation		Written Response	6.9
1331	Government and Regulators	Consultation		Written Response	6.9
1332	Government and Regulators	Consultation		Written Response	6.9
1333	Government and Regulators	Consultation		Written Response	6.9
1334	Government and Regulators	Consultation		Written Response	6.9
1335	Government and Regulators	Consultation		Written Response	6.9
1336	Government and Regulators	Consultation		Written Response	6.9
1337	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
1338	Government and Regulators	Employment		Written Response	6.6
1339	Government and Regulators	Employment		Written Response	6.6
1340	Government and Regulators	Community Investment Programme		Written Response	6.13
1341	NGO		Approach & Methodology	Written Response	4.10
1342	NGO	ESIA Documentation and Translation	Approach & Methodology	Written Response	4.10, 6.3
1343	NGO	ESIA Documentation and Translation		Written Response	6.3
1344	NGO	International Standards and Legal Compliance (social)		Written Response	6.11
1345	NGO	Management Plans	Approach & Methodology	Written Response	4.10, 8.3
1346	NGO	Tourism		Written Response	6.6
1347	NGO	Baseline		Written Response	6.4
1348	NGO	ESIA Documentation and Translation	Approach & Methodology	Written Response	4.10, 6.3
1349	NGO	International Standards and Legal Compliance (social)		Written Response	6.11
1350	NGO	ESIA Documentation and Translation	Legal Compliance (standards) - environment	Written Response	5.12, 6.3
1351	NGO		Approach & Methodology	Written Response	4.10
1352	NGO	Safety		Written Response	6.10
1353	NGO	Land Acquisition and Compensation		Written Response	6.7
1354	NGO		Noise	Written Response	5.4
1355	NGO	Tourism		Written Response	6.6
1356	NGO	International Standards and Legal Compliance (social)		Written Response	6.11
1357	NGO	Baseline		Written Response	6.4
1358	NGO	Health		Written Response	6.10
1359	NGO	Infrastructure, Transport, Roads		Written Response	6.8
1360	NGO		Noise	Written Response	5.4
1361	NGO		Unplanned events	Written Response	5.14
1362	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
1363	NGO	Security		Written Response	6.10
1364	NGO		Approach & Methodology	Written Response	4.1
1365	Other Organisation	Employment		Written Response	6.6
1366	Other Organisation	Procurement		Written Response	6.2
1367	Other Organisation	Procurement		Written Response	6.6
1368	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
1369	Other Organisation	Infrastructure, Transport, Roads		Written Response	6.8
1370	Other Organisation	Employment		Written Response	6.6
1371	Other Organisation	Tariffs		Written Response	6.11
1372	Other Organisation	Access to Energy		Written Response	6.5
1373	Other Organisation	Access to Energy		Written Response	6.5
1374	Other Organisation	Tariffs		Written Response	6.11
1375	Other Organisation		Project Description	Written Response	4
1376	Other Organisation	Support for Project		Written Response	6.2
1377	Other Organisation	Tariffs		Written Response	6.11

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1378	Other Organisation	Macroeconomics		Written Response	6.11
1379	Other Organisation	Baseline		Written Response	6.4
1380	Other Organisation	Consultation		Written Response	6.9
1381	Other Organisation	Support for Project		Written Response	6.2
1382	Other Organisation	ESIA Documentation and Translation		Written Response	6.9
1383	Other Organisation	Baseline		Written Response	6.4
1384	Other Organisation	Baseline		Written Response	6.4
1385	Other Organisation	Macroeconomics		Written Response	6.3
1386	Other Organisation	Baseline		Written Response	6.4
1387	Other Organisation	Baseline		Written Response	6.4
1388	Other Organisation	Baseline		Written Response	6.4
1389	Other Organisation	Health		Written Response	6.4
1390	Other Organisation	Baseline		Written Response	6.4
1391	Other Organisation	Data Collection		Written Response	6.4
1392	Other Organisation	Baseline		Written Response	6.4
1393	Other Organisation	Baseline		Written Response	6.4
1394	Other Organisation	Baseline		Written Response	6.4
1395	Other Organisation	ESIA Documentation and Translation		Written Response	6.3
1396	Other Organisation	ESIA Documentation and Translation		Written Response	6.3
1397	Other Organisation	Employment		Written Response	6.6
1398	Other Organisation	Employment		Written Response	6.6
1399	Other Organisation	Employment		Written Response	6.6
1400	Government and Regulators	Safety		Written Response	6.10
1401	Government and Regulators	Support for Project		Written Response	6.2
1402	Government and Regulators	Unplanned events		Written Response	6.10
1403	Government and Regulators	Unplanned events		Written Response	6.10
1404	Government and Regulators	Unplanned events		Written Response	6.10
1405	Government and Regulators	Water (social aspects)		Written Response	6.8
1406	Government and Regulators	Water (social aspects)		Written Response	6.8
1407	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
1408	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1409	Government and Regulators	Issues around Borjomi		Written Response	5.14
1410	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
1411	Government and Regulators		Approach & Methodology	Written Response	4.10
1412	Government and Regulators	ESIA Documentation and Translation		Written Response	6.3
1413	Government and Regulators	Baseline	Approach & Methodology	Written Response	4.10, 6.4
1414	Government and Regulators	ESIA Documentation and Translation		Written Response	6.3
1415	Government and Regulators	ESIA Documentation and Translation		Written Response	6.3
1416	Government and Regulators		Seismicity	Written Response	5.5
1417	Government and Regulators		Route	Written Response	3
1418	Government and Regulators		Route	Written Response	5.14
1419	Government and Regulators	Tourism		Written Response	5.14, 6.6
1420	Government and Regulators	Issues around Borjomi		Written Response	5.14
1421	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1422	Government and Regulators		Waste / Waste Water	Written Response	4.8
1423	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
1424	Government and Regulators	Management Plans		Written Response	6.13, 6.10
1425	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
1426	Government and Regulators	Management Plans		Written Response	8.3
1427	Government and Regulators	Management Plans	Environmental Management Plans	Written Response	8.2, 8.3

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1428	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
1429	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7, 6.11
1430	Government and Regulators	Health	PD - System construction	Written Response	4.2
1431	Government and Regulators	Baseline	Environmental Monitoring	Written Response	6.4, 8.2
1432	Government and Regulators	Health		Written Response	6.10
1433	Government and Regulators	Baseline		Written Response	6.4
1434	Government and Regulators	Baseline	water environmental	Written Response	5.8, 6.4
1435	Government and Regulators	Baseline	water environmental	Written Response	5.8, 6.4
1436	Government and Regulators		Waste / Waste Water	Written Response	5.8
1437	Government and Regulators		PD - System construction	Written Response	4.2
1438	Government and Regulators		Anthrax	Written Response	5.7
1439	Government and Regulators	Community Investment Programme		Written Response	6.13
1440	Government and Regulators	Consultation		Written Response	6.9
1441	Government and Regulators	Consultation		Written Response	6.9
1442	Government and Regulators	Consultation		Written Response	8.3
1443	Government and Regulators	Community Investment Programme		Written Response	6.13
1444	Government and Regulators	Community Investment Programme		Written Response	6.13
1445	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
1446	Government and Regulators	Employment		Written Response	6.6
1447	Government and Regulators	Community Investment Programme		Written Response	6.13
1448	Government and Regulators	Community Investment Programme		Written Response	6.13
1449	Government and Regulators	Community Investment Programme		Written Response	6.13
1450	Government and Regulators	Community Investment Programme	Waste / Waste Water	Written Response	5.8, 6.13
1451	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.8
1452	Government and Regulators	Demography and Ethnicity		Written Response	6.7
1453	Government and Regulators		Anthrax	Written Response	5.7, 1453a
1454	Government and Regulators		Anthrax	Written Response	5.7, 1454a
1455	Government and Regulators		Anthrax	Written Response	5.7
1456	Government and Regulators	Consultation	Anthrax	Written Response	5.7, 6.9
1457	Government and Regulators	Water (social aspects)		Written Response	6.8
1458	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
1459	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1460	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
1461	Government and Regulators	Reinstatement	PD - Reinstate & Erosion	Written Response	4.4
1462	Government and Regulators	Tourism	Construction - Environment	Written Response	6.6, 8.2
1463	Government and Regulators	Community Investment Programme	Environmental Investment Programme	Written Response	6.13
1464	Government and Regulators	Community Investment Programme		Written Response	6.13
1465	Government and Regulators	Health		Written Response	6.10
1466	Government and Regulators	Community Investment Programme		Written Response	6.13
1467	Government and Regulators	Community Investment Programme		Written Response	6.13

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1468	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1469	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1470	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1471	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1472	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1473	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1474	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1475	Government and Regulators	Community Investment Programme		Written Response	6.9
1476	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1477	Government and Regulators	Employment		Written Response	6.6
1478	Government and Regulators	Unplanned events		Written Response	6.10, 6.10
1479	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.8
1480	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.9
1481	Government and Regulators	Reinstatement	Soil	Written Response	5.6, 6.7, 6.7
1482	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.8
1483	Government and Regulators		Landscape / Visual Impacts	Written Response	5.9
1484	Government and Regulators	Tourism		Written Response	6.6
1485	Government and Regulators	ESIA Documentation and Translation		Written Response	6.3
1486	Government and Regulators	Tourism		Written Response	6.6
1487	Government and Regulators	ESIA Documentation and Translation		Written Response	6.10
1488	Government and Regulators	ESIA Documentation and Translation		Written Response	6.4
1489	Government and Regulators	ESIA Documentation and Translation		Written Response	6.9
1490	Government and Regulators	ESIA Documentation and Translation		Written Response	6.2
1491	Government and Regulators	ESIA Documentation and Translation		Written Response	6.6
1492	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	8.2, 8.3
1493	Government and Regulators	ESIA Documentation and Translation		Written Response	6.11, 6.7
1494	Government and Regulators	Baseline		Written Response	6.4
1495	Government and Regulators	Water (social aspects)		Written Response	6.8
1496	Government and Regulators		PD - System construction	Written Response	4.2
1497	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1498	Government and Regulators		PD - Project design basis	Written Response	4.1
1499	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.8
1500	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1501	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1502	Government and Regulators	Water (social aspects)	HydroGeology / Geomorphology	Written Response	5.8, 6.8
1503	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
1504	Government and Regulators		Project Description	Written Response	5.5
1505	Government and Regulators	Infrastructure, Transport, Roads	Project Description	Written Response	6.8
1506	Government and Regulators		Project Description	Written Response	4
1507	Government and Regulators		Project Description	Written Response	4

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1508	Government and Regulators		Oil Spill Modelling	Written Response	5.14
1509	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1510	Government and Regulators		Project Description	Written Response	4
1511	Government and Regulators		Project Description	Written Response	4
1512	Government and Regulators		Project Description	Written Response	4
1513	Government and Regulators	Community Investment Programme	Flora and Fauna	Written Response	5.11, 6.13
1514	Government and Regulators		Forestry	Written Response	5.11
1515	Government and Regulators	Community Investment Programme	PD - Reinstate & Erosion	Written Response	4.4
1516	Government and Regulators		Soil	Written Response	5.6
1517	Government and Regulators		Project Description	Written Response	4
1518	Government and Regulators		Environmental Management Plans	Written Response	8
1519	Government and Regulators	Safety	Waste / Waste Water	Written Response	6.10
1520	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
1521	Government and Regulators		Environmental Management Plans	Written Response	8
1522	Government and Regulators	Infrastructure, Transport, Roads	Construction - Environment	Written Response	6.8
1523	Government and Regulators		Construction - Environment	Written Response	5.6, 6.7
1524	Government and Regulators		Waste / Waste Water	Written Response	5.8
1525	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	6.11, 8.2
1526	Government and Regulators		Project Description	Written Response	4
1527	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1528	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1529	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1530	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1531	Government and Regulators		Project Description	Written Response	4
1532	Government and Regulators		Construction - Environment	Written Response	4.5
1533	Government and Regulators	Data Collection		Written Response	6.3
1534	Government and Regulators	Unplanned Events	Unplanned events	Written Response	6.8, 6.10
1535	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1536	Government and Regulators		Landscape / Visual Impacts	Written Response	5.9
1537	Government and Regulators		Flora and Fauna	Written Response	5.11
1538	Government and Regulators		Unplanned events	Written Response	4.9
1539	Government and Regulators		Environmental Management Plans	Written Response	8.2
1540	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1541	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1542	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1543	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1544	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1545	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1546	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1547	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5

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1548	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1549	Government and Regulators		PD - Ops Control & Maintenance	Written Response	4.5
1550	Government and Regulators		Construction - Environment	Written Response	4.5
1551	Government and Regulators		Waste / Waste Water	Written Response	4.8
1552	Government and Regulators		Unplanned events	Written Response	4.9
1553	Government and Regulators		Project Alternatives	Written Response	3
1554	Government and Regulators	Tourism	Landscape / Visual Impacts	Written Response	5.9, 6.6
1555	Government and Regulators		Geohazards	Written Response	5.5
1556	Government and Regulators	Consultation	Approach & Methodology	Written Response	6.9
1557	Government and Regulators	Water (social aspects)	HydroGeology / Geomorphology	Written Response	6.8
1558	Government and Regulators	General Construction Queries	Noise	Written Response	6.9, 5.11, 5.4
1559	Government and Regulators	General Construction Queries	Forestry	Written Response	6.9, 5.11
1560	Government and Regulators		water environmental	Written Response	5.8
1561	Government and Regulators	Tourism	Forestry	Written Response	5.11, 6.6
1562	Government and Regulators		Oil Spill Modelling	Written Response	4.9
1563	Government and Regulators		Project Alternatives	Written Response	3
1564	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1565	Government and Regulators		Oil Spill Modelling	Written Response	5.5
1566	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1567	Government and Regulators		Project Description	Written Response	4
1568	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
1569	Government and Regulators		Flora and Fauna	Written Response	5.11
1570	Government and Regulators		Flora and Fauna	Written Response	5.11
1571	Government and Regulators		Fish / fisheries	Written Response	5.11
1572	Government and Regulators	Land Use Restrictions		Written Response	6.7
1573	Government and Regulators		Fish / fisheries	Written Response	5.11
1574	Government and Regulators		Flora and Fauna	Written Response	5.11
1575	Government and Regulators		Environmental Management Plans	Written Response	8
1576	Government and Regulators		Flora and Fauna	Written Response	5.11
1577	Government and Regulators		Flora and Fauna	Written Response	5.11
1578	Government and Regulators		Flora and Fauna	Written Response	5.11
1579	Government and Regulators		Flora and Fauna	Written Response	5.11
1580	Government and Regulators		Flora and Fauna	Written Response	5.11
1581	Government and Regulators		Flora and Fauna	Written Response	5.11
1582	Government and Regulators		Flora and Fauna	Written Response	5.11
1583	Government and Regulators		Flora and Fauna	Written Response	5.11
1584	Government and Regulators		Flora and Fauna	Written Response	5.11
1585	Government and Regulators		Flora and Fauna	Written Response	5.11
1586	Government and Regulators		Flora and Fauna	Written Response	5.11
1587	Government and Regulators		Flora and Fauna	Written Response	5.11

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1588	Government and Regulators		Flora and Fauna	Written Response	5.11
1589	Government and Regulators		Flora and Fauna	Written Response	5.11
1590	Government and Regulators		Flora and Fauna	Written Response	5.11
1591	Government and Regulators		Flora and Fauna	Written Response	5.11
1592	Government and Regulators		Flora and Fauna	Written Response	5.11
1593	Government and Regulators		Flora and Fauna	Written Response	5.11
1594	Independent Report	General Construction Queries	Construction - Environment	Written Response	5.11, 7.2, 8.2, 6.9
1595	Independent Report		Cumulative Impacts - Environment	Written Response	5.11, 7.2
1596	Independent Report		Flora and Fauna	Written Response	5.11
1597	Independent Report		Flora and Fauna	Written Response	5.11
1598	Independent Report		Forestry	Written Response	5.11
1599	Independent Report		Flora and Fauna	Written Response	5.11
1600	Independent Report		water environmental	Written Response	5.8
1601	Independent Report		HydroGeology / Geomorphology	Written Response	5.5, 5.14
1602	Independent Report		Archaeology & Cultural Heritage	Written Response	5.1
1603	Independent Report		Approach & Methodology	Written Response	3
1604	Independent Report		Approach & Methodology	Written Response	3
1605	Independent Report		Construction - environment	Written Response	5.7
1606	Independent Report		water environmental	Written Response	5.11
1607	Independent Report		Flora and Fauna	Written Response	5.11
1608	Independent Report		Air Quality	Written Response	5.3
1609	Independent Report		Landscape / Visual Impacts	Written Response	5.9
1610	Independent Report		Flora and Fauna	Written Response	5.11
1611	Independent Report		Flora and Fauna	Written Response	5.11
1612	Independent Report		Flora and Fauna	Written Response	5.11
1613	Independent Report		Environmental Management Plans	Written Response	8
1614	Independent Report		Environmental Management Plans	Written Response	8
1615	Independent Report		Cumulative Impacts - Environment	Written Response	5.11, 7.2
1616	Independent Report		Legal Compliance (standards) - environment	Written Response	8.2
1617	Independent Report		Air Quality	Written Response	5.3
1618	Independent Report		Construction - environment	Written Response	4.5
1619	Independent Report		Oil Spill Modelling	Written Response	4.9
1620	Independent Report		Forestry	Written Response	5.11
1621	Independent Report		Noise	Written Response	5.4
1622	Independent Report		water environmental	Written Response	5.11
1623	Independent Report		Protected areas	Written Response	5.12
1624	Independent Report		Climate	Written Response	5.2
1625	Independent Report		Geohazards	Written Response	5.5
1626	Independent Report		Flora and Fauna	Written Response	5.11
1627	Independent Report		Flora and Fauna	Written Response	5.11
1628	Independent Report		Flora and Fauna	Written Response	5.11
1629	Independent Report		Forestry	Written Response	5.11
1630	Independent Report		Flora and Fauna	Written Response	5.11
1631	Independent Report		Construction - Environment	Written Response	8.2
1632	Independent Report		Environmental Management Plans	Written Response	8
1633	Independent Report		Cumulative Impacts - Environment	Written Response	7.2
1634	Independent Report		Environmental Management Plans	Written Response	8
1635	Independent Report		Air Quality	Written Response	5.3
1636	Independent Report		Environmental Management Plans	Written Response	8.2
1637	Independent Report		Environmental Management Plans	Written Response	8.2
1638	Independent Report		Flora and Fauna	Written Response	5.11
1639	Independent Report		Oil Spill Mitigation	Written Response	5.14
1640	Independent Report		Environmental Management Plans	Written Response	8.2
1641	Independent Report		Environmental Monitoring	Written Response	8.2
1642	Independent Report		Construction - Environment	Written Response	5.8
1643	Independent Report	Management Plans	Legal Compliance (standards) - environment	Written Response	6.7, 6.13, 6.8, 8.2
1644	Independent Report		Flora and Fauna	Written Response	5.11

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1645	Independent Report		Forestry	Written Response	5.11
1646	Independent Report		Environmental Management Plans	Written Response	8.2
1647	Independent Report	ESIA Documentation and Translation	Unplanned events	Written Response	6.3
1648	Independent Report		water environmental	Written Response	4.10, 5.5
1649	Independent Report		Forestry	Written Response	5.11
1650	Independent Report		Environmental Management Plans	Written Response	8
1651	Independent Report		Environmental Management Plans	Written Response	8
1652	Independent Report		Flora and Fauna	Written Response	5.11
1653	Independent Report		Environmental Monitoring	Written Response	8.2
1654	Independent Report		Environmental Management Plans	Written Response	8
1655	Independent Report		Fish / fisheries	Written Response	5.11
1656	Independent Report		HydroGeology / Geomorphology	Written Response	5.8
1657	Independent Report		Construction - environment	Written Response	5.8, 8.2
1658	Independent Report		Environmental Management Plans	Written Response	8
1659	Independent Report		Construction - environment	Written Response	5.8
1660	Independent Report		Archaeology & Cultural Heritage	Written Response	5.1
1661	Independent Report		Air Quality	Written Response	5.3
1662	Independent Report		Air Quality	Written Response	5.3
1663	Independent Report	Community Relations	Noise	Written Response	6.9
1664	Independent Report		Environmental Management Plans	Written Response	5.8
1665	Independent Report		HydroGeology / Geomorphology	Written Response	5.14
1666	Independent Report		Construction - environment	Written Response	4.5
1667	Independent Report		Archaeology & Cultural Heritage	Written Response	5.1
1668	Independent Report		Environmental Management Plans	Written Response	8
1669	Independent Report		Landscape / Visual Impacts	Written Response	5.9
1670	Independent Report		HydroGeology / Geomorphology	Written Response	4.1, 5.14
1671	Independent Report		Oil Spill Modelling	Written Response	5.14
1672	Independent Report		Oil Spill Modelling	Written Response	5.14
1673	Independent Report		Environmental Management Plans	Written Response	8.2
1674	Independent Report		Environmental Investment Programme	Written Response	8.2
1675	Independent Report		Forestry	Written Response	5.11
1676	Independent Report		Flora and Fauna	Written Response	5.11
1677	Independent Report		Legal Compliance (standards) - environment	Written Response	4
1678	Independent Report		Cumulative Impacts - Environment	Written Response	7.2
1679	Independent Report		Air Quality	Written Response	5.3
1680	Independent Report		Noise	Written Response	5.4
1681	Independent Report		Noise	Written Response	5.4
1682	Independent Report		Construction - environment	Written Response	5.7
1683	Independent Report		Construction - environment	Written Response	5.7
1684	Independent Report		water environmental	Written Response	5.8
1685	Independent Report		Soil	Written Response	5.7
1686	Independent Report		Flora	Written Response	5.11
1687	Independent Report		Fish / fisheries	Written Response	5.11
1688	Independent Report		Protected areas	Written Response	5.12
1689	Independent Report		Flora	Written Response	5.11
1690	Independent Report		PD - Project Schedule	Written Response	4.2
1691	Independent Report		Noise	Written Response	5.4
1692	Independent Report		Archaeology & Cultural Heritage	Written Response	5.1
1693	Independent Report		Flora and Fauna	Written Response	5.11
1694	Independent Report		Flora and Fauna	Written Response	5.11
1695	Independent Report		Noise	Written Response	5.4
1696	Independent Report		Air Quality	Written Response	5.3
1697	Independent Report		Air Quality	Written Response	5.3
1698	Independent Report		Air Quality	Written Response	5.3
1699	Independent Report		Air Quality	Written Response	5.3
1700	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1701	Independent Report		PD - System Construction	Written Response	4.2
1702	Independent Report		PD - Wastes & Emissions	Written Response	4.5
1703	Independent Report		PD - Wastes & Emissions	Written Response	4.5
1704	Independent Report		PD - Wastes & Emissions	Written Response	4.5
1705	Independent Report		PD - Wastes & Emissions	Written Response	4.5

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1706	Independent Report		PD - Wastes & Emissions	Written Response	4.5
1707	Independent Report		PD - Wastes	Written Response	4.8
1708	Independent Report		PD - System Construction	Written Response	4.2
1709	Independent Report		PD - System Construction	Written Response	4.2
1710	Independent Report		PD - System Construction	Written Response	4.2
1711	Independent Report		PD - Wastes	Written Response	4.8
1712	Independent Report		PD - Wastes	Written Response	4.8
1713	Independent Report		PD - Wastes	Written Response	4.8
1714	Independent Report		PD - Wastes	Written Response	4.8
1715	Independent Report		PD - Wastes	Written Response	4.8
1716	Independent Report		PD - Wastes	Written Response	4.8
1717	Independent Report		PD - Waste Management	Written Response	4.8
1718	Independent Report		PD - Wastes	Written Response	4.8
1719	Independent Report		PD - Waste Management	Written Response	4.8
1720	Independent Report		PD - Wastes	Written Response	4.8
1721	Independent Report		Unplanned Events	Written Response	5.3
1722	Independent Report		Unplanned Events	Written Response	4.9
1723	Independent Report		Oil Spill Modelling	Written Response	4.9
1724	Independent Report		PD - System Construction	Written Response	4.2
1725	Independent Report		PD - Wastes	Written Response	4.8
1726	Independent Report		Route	Written Response	3
1727	Independent Report		PD - System Construction	Written Response	4.2
1728	Independent Report		Route	Written Response	3
1729	Independent Report		Route	Written Response	3
1730	Independent Report		Route	Written Response	3
1731	Independent Report		Route	Written Response	3
1732	Independent Report		Route	Written Response	3
1733	Independent Report		Route	Written Response	3
1734	Independent Report		Route	Written Response	3
1735	Independent Report		Route	Written Response	3
1736	Independent Report		Route	Written Response	3
1737	Independent Report		Route	Written Response	3
1738	Independent Report		PD - Waste Management	Written Response	4.8
1739	Independent Report		Unplanned Events	Written Response	4.9
1740	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	5.3
1741	Independent Report		PD - Wastes	Written Response	4.8
1742	Independent Report		Project Alternatives	Written Response	3
1743	Independent Report		Unplanned Events	Written Response	5.5
1744	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1745	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1746	Independent Report		Unplanned Events	Written Response	4.9
1747	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1748	Independent Report		Unplanned Events	Written Response	4.9
1749	Independent Report		Unplanned Events	Written Response	4.9
1750	Independent Report		PD - Wastes & Emissions	Written Response	4.5
1751	Independent Report		PD - System Construction	Written Response	4.2
1752	Independent Report		PD - Wastes	Written Response	4.8
1753	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1754	Independent Report		PD - System Construction	Written Response	4.2
1755	Independent Report		PD - Wastes	Written Response	4.8
1756	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1757	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1758	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1759	Independent Report		PD - System Construction	Written Response	4.2
1760	Independent Report		PD - Ops Control & Maintenance	Written Response	8.2
1761	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	5.3
1762	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1763	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1764	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1765	Independent Report		PD - Reinstate & Erosion	Written Response	4.4
1766	Independent Report		PD - Reinstate & Erosion	Written Response	4.4
1767	Independent Report		PD - Reinstate & Erosion	Written Response	4.4
1768	Independent Report		PD - System Construction	Written Response	4.2
1769	Independent Report		PD - System Construction	Written Response	4.2
1770	Independent Report		PD - System Construction	Written Response	4.2
1771	Independent Report		PD - Project Design Basis	Written Response	4.1
1772	Independent Report		PD - Project Design Basis	Written Response	4.1

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1773	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	5.3
1774	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	5.3
1775	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1776	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1777	Independent Report		PD - Project Design Basis	Written Response	4.1
1778	Independent Report		PD - Project Design Basis	Written Response	4.1
1779	Independent Report		PD - Project Design Basis	Written Response	4.1
1780	Independent Report		PD - Project Design Basis	Written Response	4.1
1781	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1782	Independent Report		PD - Project Design Basis	Written Response	4.1
1783	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1784	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1785	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1786	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1787	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1788	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1789	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1790	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1791	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1792	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1793	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1794	Independent Report		PD - System Construction	Written Response	4.2
1795	Independent Report		PD - Project Design Basis	Written Response	4.1
1796	Independent Report		PD - System Construction	Written Response	4.2
1797	Independent Report		PD - System Construction	Written Response	4.2
1798	Independent Report		PD - System Construction	Written Response	4.2
1799	Independent Report		PD - Reinstate & Erosion	Written Response	4.4
1800	Independent Report		PD - Decommissioning	Written Response	4.6
1801	Independent Report		PD - Wastes & Emissions	Written Response	4.5
1802	Independent Report		PD - Project Design Basis	Written Response	5.5
1803	Independent Report		PD - Reinstate & Erosion	Written Response	4.4
1804	Independent Report		PD - Reinstate & Erosion	Written Response	4.4
1805	Independent Report		PD - System Construction	Written Response	4.2
1806	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1807	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1808	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1809	Independent Report		Unplanned Events	Written Response	4.9
1810	Independent Report		Unplanned Events	Written Response	4.9
1811	Independent Report		Unplanned Events	Written Response	4.9
1812	Independent Report		Unplanned Events	Written Response	4.9
1813	Independent Report		Unplanned Events	Written Response	4.9
1814	Independent Report		Unplanned Events	Written Response	4.9
1815	Independent Report		Air Quality	Written Response	5.3, 5.14
1816	Independent Report		Soil	Written Response	5.7
1817	Independent Report		Noise	Written Response	5.4
1818	Independent Report		water environmental	Written Response	5.8
1819	Independent Report		Noise	Written Response	5.4
1820	Independent Report		Environmental Monitoring	Written Response	8.2
1821	Independent Report		Environmental Monitoring	Written Response	8.2
1822	Independent Report		Oil Spill Modelling	Written Response	4.9
1823	Government and Regulators		PD - Decommissioning	Written Response	4.6
1824	Government and Regulators		PD - Wastes	Written Response	4.8
1825	Government and Regulators		PD - Outline of Pipeline & Facilities	Written Response	4.2
1826	Government and Regulators		PD - System Construction	Written Response	4.2
1827	Government and Regulators		PD - Wastes	Written Response	4.8
1828	Government and Regulators		PD - Wastes	Written Response	4.8

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1829	Government and Regulators		PD - Wastes	Written Response	4.8
1830	Government and Regulators		PD - Wastes	Written Response	4.8
1831	Government and Regulators		Unplanned Events	Written Response	4.9
1832	Government and Regulators		Project Alternatives	Written Response	3
1833	Government and Regulators		Project Alternatives	Written Response	3
1834	Government and Regulators		Project Alternatives	Written Response	3
1835	Government and Regulators		Project Alternatives	Written Response	3
1836	Government and Regulators		Route	Written Response	3
1837	Government and Regulators		Route	Written Response	3
1838	Government and Regulators		Route	Written Response	3
1839	Government and Regulators		Route	Written Response	3
1840	Government and Regulators	ESIA Documentation and Translation	Approach & Methodology	Written Response	6.3
1841	Government and Regulators		Approach & Methodology	Written Response	6.3
1842	Government and Regulators	ESIA Documentation and Translation	Approach & Methodology	Written Response	8.3
1843	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
1844	Government and Regulators		Project Description	Written Response	8.2
1845	Government and Regulators		Environmental Monitoring	Written Response	8.2
1846	Government and Regulators		Cumulative Impacts - Environment	Written Response	5.14
1847	Government and Regulators	Tourism	Legal Compliance (standards) - environment	Written Response	5.14, 6.6
1848	Government and Regulators		Route	Written Response	5.8, 5.14
1849	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
1850	Government and Regulators	Monitoring - Social	Environmental Monitoring	Written Response	8.2, 8.3
1851	Government and Regulators		Environmental Management Plans	Written Response	5.11
1852	Government and Regulators	Land Acquisition and Compensation	PD - Reinstate & Erosion	Written Response	4.4
1853	Government and Regulators	Infrastructure, Transport, Roads	PD - Reinstate & Erosion	Written Response	4.4
1854	Government and Regulators		Environmental Monitoring	Written Response	8.2
1855	Government and Regulators		AGIs - Environment	Written Response	7.2
1856	Government and Regulators		Flora and Fauna	Written Response	5.4
1857	Government and Regulators		PD - Decommissioning	Written Response	4.6
1858	Government and Regulators			Written Response	3
1859	Government and Regulators			Written Response	3
1860	Government and Regulators			Written Response	3
1861	Government and Regulators			Written Response	3
1862	Government and Regulators			Written Response	3
1863	Government and Regulators		Route	Written Response	5.12
1864	Government and Regulators		Flora and Fauna	Written Response	5.11
1865	Government and Regulators		PD - Reinstate & erosion	Written Response	4.4
1866	Government and Regulators		Legal Compliance (standards) - environment	Written Response	4
1867	Government and Regulators	Safety	Approach & Methodology	Written Response	5.5, 8.2, 6.10
1868	Government and Regulators	Health	Legal Compliance (standards) - environment	Written Response	6.10, 8.2

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1869	Government and Regulators		Soil	Written Response	5.6
1870	Government and Regulators	Baseline	water environmental	Written Response	5.5, 6.4
1871	Government and Regulators		Emissions	Written Response	5.3
1872	Government and Regulators		Legal Compliance (standards) - environment	Written Response	5.12
1873	Government and Regulators		Anthrax (?)	Written Response	5.7
1874	Government and Regulators		Project Alternatives	Written Response	3
1875	Government and Regulators		Project Alternatives	Written Response	3
1876	Government and Regulators		Project Alternatives	Written Response	3
1877	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1878	Government and Regulators		Project Alternatives	Written Response	3
1879	Government and Regulators		Construction - Environment	Written Response	8.2
1880	Government and Regulators		Protected Areas	Written Response	5.5, 5.12
1881	Government and Regulators		Erosion	Written Response	4.4
1882	Government and Regulators		Flora	Written Response	5.11
1883	Government and Regulators		Flora and Fauna	Written Response	5.11
1884	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
1885	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1886	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1887	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1888	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1889	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1890	Government and Regulators		water environmental	Written Response	5.8
1891	Government and Regulators		Oil Spill Modelling	Written Response	5.5
1892	Government and Regulators		Oil Spill Mitigation	Written Response	4.9
1893	Government and Regulators		Oil Spill Mitigation	Written Response	4.9
1894	Government and Regulators		Oil Spill Mitigation	Written Response	5.5
1895	Government and Regulators		Oil Spill Mitigation	Written Response	5.5
1896	Government and Regulators		Oil Spill Mitigation	Written Response	5.5
1897	Government and Regulators		Oil Spill Mitigation	Written Response	5.5
1898	Government and Regulators		Oil Spill Mitigation	Written Response	5.5
1899	Government and Regulators		Route	Written Response	3
1900	Government and Regulators		Oil Spill Mitigation	Written Response	5.5, 5.14
1901	Government and Regulators		Hydrogeology	Written Response	5.14
1902	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
1903	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
1904	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1905	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1906	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1907	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1908	Government and Regulators		PD - Project Design Basis	Written Response	4.1

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1909	Government and Regulators		Project Alternatives	Written Response	3
1910	Government and Regulators		Project Alternatives	Written Response	3
1911	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1912	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1913	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1914	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1915	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1916	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1917	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1918	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1919	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1920	Government and Regulators		Project Alternatives	Written Response	3
1921	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1922	Government and Regulators		Project Alternatives	Written Response	3
1923	Government and Regulators		Environmental Monitoring	Written Response	8.2
1924	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
1925	Government and Regulators		Cumulative Impacts - Environment	Written Response	7
1926	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1927	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1928	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
1929	Government and Regulators		Oil Spill Modelling	Written Response	4.9
1930	Government and Regulators		Oil Spill Modelling	Written Response	5.5
1931	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1932	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1933	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
1934	Government and Regulators		Project Alternatives	Written Response	3
1935	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
1936	Government and Regulators		Project Alternatives	Written Response	3
1937	Government and Regulators		Project Alternatives	Written Response	3
1938	Government and Regulators		Project Alternatives	Written Response	3
1939	Government and Regulators		Air Quality	Written Response	5.3
1940	Government and Regulators		Project Alternatives	Written Response	3
1941	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1942	Government and Regulators		Legal Compliance (standards) - environment	Written Response	5.12
1943	Government and Regulators		Route	Written Response	3
1944	Government and Regulators		Protected Areas	Written Response	5.12
1945	Government and Regulators	Macroeconomics	Approach & Methodology	Written Response	6.3
1946	Government and Regulators		Approach & Methodology	Written Response	3
1947	Government and Regulators		Approach & Methodology	Written Response	3
1948	Government and Regulators		Approach & Methodology	Written Response	3

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1949	Government and Regulators		Approach & Methodology	Written Response	3
1950	Government and Regulators		Route	Written Response	5.11
1951	Government and Regulators		Approach & Methodology	Written Response	3
1952	Government and Regulators	Tourism	Legal Compliance (standards) - environment	Written Response	5.11, 7.2, 6.6
1953	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	6.11, 8.2
1954	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1955	Government and Regulators		Approach & Methodology	Written Response	3
1956	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
1957	Government and Regulators		Environmental Management Plans	Written Response	8.2
1958	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
1959	Government and Regulators	Monitoring - Social	Environmental Monitoring	Written Response	8.2, 8.3
1960	Government and Regulators		Environmental Management Plans	Written Response	5.11
1961	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
1962	Government and Regulators	Infrastructure, Transport, Roads	PD - Reinstate & Erosion	Written Response	4.4
1963	Government and Regulators		Approach & Methodology	Written Response	3
1964	Government and Regulators		AGIs - Environment	Written Response	5.11
1965	Government and Regulators		Environmental Monitoring	Written Response	8.2
1966	Government and Regulators		PD - Decommissioning	Written Response	4.6
1967	Government and Regulators		Route	Written Response	5.12
1968	Government and Regulators		Flora and Fauna	Written Response	5.11
1969	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
1970	Government and Regulators		Waste / Waste water	Written Response	8.2
1971	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
1972	Government and Regulators		Climate	Written Response	5.2
1973	Government and Regulators		Climate	Written Response	5.2
1974	Government and Regulators		Climate	Written Response	5.2
1975	Government and Regulators		Climate	Written Response	5.2
1976	Government and Regulators		Climate	Written Response	5.2
1977	Government and Regulators		Climate	Written Response	5.2
1978	Government and Regulators		Air Quality	Written Response	5.3
1979	Government and Regulators		Climate	Written Response	5.2
1980	Government and Regulators		Climate	Written Response	5.2
1981	Government and Regulators		Climate	Written Response	5.2
1982	Government and Regulators		Consultation	Written Response	3
1983	Government and Regulators		Soil	Written Response	5.6
1984	Government and Regulators		water environmental	Written Response	5.8
1985	Government and Regulators		Air quality	Written Response	5.3
1986	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
1987	Government and Regulators		Climate	Written Response	5.2
1988	Government and Regulators		Environmental Monitoring	Written Response	8.2

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1989	Government and Regulators		Protected Areas	Written Response	5.12
1990	Government and Regulators		Seismicity	Written Response	5.5
1991	Government and Regulators		Seismicity	Written Response	5.5
1992	Government and Regulators		Seismicity	Written Response	5.5
1993	Government and Regulators		Seismicity	Written Response	5.5
1994	Government and Regulators		Seismicity	Written Response	5.5
1995	Government and Regulators		Seismicity	Written Response	5.5
1996	Government and Regulators		Seismicity	Written Response	5.5
1997	Government and Regulators		Seismicity	Written Response	5.5
1998	Government and Regulators	Tourism	Archaeology & Cultural Heritage	Written Response	5.1
1998a	NGO		Project Alternatives	Written Response	3
1999	NGO		Route	Written Response	3
2000	NGO		Route	Written Response	3
2001	NGO		Route	Written Response	3
2002	NGO		Route	Written Response	3
2003	NGO		Project Alternatives	Written Response	3
2004	NGO		Project Alternatives	Written Response	3
2005	NGO		PD - Project Design Basis	Written Response	4.1
2006	NGO		PD - Project Design Basis	Written Response	4.1
2007	NGO		Environmental Monitoring	Written Response	8.2
2008	NGO		Environmental Monitoring	Written Response	5.3. 5.11
2009	NGO		Legal Compliance (standards) - environment	Written Response	5.12
2010	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2011	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2012	NGO		PD - System Construction	Written Response	4.2
2013	NGO		Forests	Written Response	8.2
2014	NGO		PD - System Construction	Written Response	4.2
2015	NGO		Environmental Monitoring	Written Response	8.2
2016	NGO		PD - Ops Control & Maintenance	Written Response	4.5
2017	NGO		Flora and Fauna	Written Response	5.11
2018	NGO		PD - Decommissioning	Written Response	4.6
2019	NGO		Flora and Fauna	Written Response	5.11
2020	NGO		PD - Reinstate & Erosion	Written Response	4.4
2021	NGO		PD - Wastes	Written Response	4.8
2022	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2023	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2024	NGO		Legal Compliance (standards) - environment	Written Response	5.12
2025	NGO		Air Quality	Written Response	5.3
2026	NGO		Air Quality	Written Response	5.3
2027	NGO		PD - Wastes & Emissions	Written Response	4.5
2028	NGO		PD - Wastes & Emissions	Written Response	4.5
2029	NGO		PD - Wastes & Emissions	Written Response	4.5
2030	NGO	Safety		Written Response	6.10
2031	NGO	Land Acquisition and Compensation		Written Response	6.7
2032	NGO		Forests	Written Response	5.11
2033	NGO		Forests	Written Response	5.11
2034	NGO		Forests	Written Response	5.11
2035	NGO		Environmental Monitoring	Written Response	8.2
2036	NGO		Environmental Monitoring	Written Response	5.11
2037	NGO		Forests	Written Response	5.11
2038	NGO		Forests	Written Response	5.11
2039	NGO		Forests	Written Response	5.11
2040	NGO		Forests	Written Response	5.11
2041	NGO		Forests	Written Response	5.11
2042	NGO		Flora and Fauna	Written Response	5.11
2043	NGO		Landscape / Visual Impacts	Written Response	5.9
2044	NGO		Soil	Written Response	5.7
2045	NGO		Legal Compliance (standards) - environment	Written Response	5.12
2046	NGO		Legal Compliance (standards) - environment	Written Response	8.2

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2047	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2048	NGO		Forests	Written Response	5.11
2049	NGO		Forests	Written Response	5.11
2050	NGO		Flora and Fauna	Written Response	5.11
2051	NGO		Flora and Fauna	Written Response	5.11
2052	NGO		Noise	Written Response	5.4
2053	NGO		Air Quality	Written Response	5.3
2054	NGO		Forests	Written Response	5.11
2055	NGO		Forests	Written Response	5.11
2056	NGO	Tourism		Written Response	6.6
2057	NGO		PD - Wastes & Emissions	Written Response	4.5
2058	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2059	NGO	Health	Anthrax and Disease	Written Response	5.7, 6.1
2060	NGO	Health	PD - Wastes & Emissions	Written Response	4.5
2061	NGO		Flora and Fauna	Written Response	5.11
2062	NGO		Flora and Fauna	Written Response	5.11
2063	NGO		Noise	Written Response	5.4
2064	NGO		Flora and Fauna	Written Response	5.11
2065	NGO		pd - wastes	Written Response	4.8
2066	NGO		pd - wastes	Written Response	4.8
2067	NGO		PD - Wastes & Emissions	Written Response	4.5
2068	NGO		pd - waste management	Written Response	4.8
2069	NGO		pd - waste management	Written Response	4.8
2070	NGO		Flora and Fauna	Written Response	5.11
2071	NGO		Flora and Fauna	Written Response	5.11
2072	NGO		PD - System Construction	Written Response	4.2
2073	NGO		Flora and Fauna	Written Response	5.11
2074	NGO		Flora and Fauna	Written Response	5.11
2075	NGO		Flora and Fauna	Written Response	5.11
2076	NGO		Flora and Fauna	Written Response	5.11
2077	NGO		Flora and Fauna	Written Response	5.11
2078	NGO		Flora and Fauna	Written Response	5.11
2079	NGO		Flora and Fauna	Written Response	5.11
2080	NGO		Flora and Fauna	Written Response	5.11
2081	NGO		PD - System Construction	Written Response	4.2
2082	NGO		Flora and Fauna	Written Response	5.11
2083	NGO		Flora and Fauna	Written Response	5.11
2084	NGO		Flora and Fauna	Written Response	5.11
2085	NGO		Flora and Fauna	Written Response	5.11
2086	NGO		Flora and Fauna	Written Response	5.11
2087	NGO		Route	Written Response	3
2088	NGO		Hydrogeology / Geomorphology	Written Response	5.5
2089	NGO		Route	Written Response	3
2090	NGO		Flora and Fauna	Written Response	5.11
2091	NGO		Flora and Fauna	Written Response	5.11
2092	NGO		Flora and Fauna	Written Response	5.11
2093	NGO		Flora and Fauna	Written Response	5.11
2094	NGO		Flora and Fauna	Written Response	5.11
2095	NGO		Flora and Fauna	Written Response	5.11
2096	NGO		Route	Written Response	3
2097	NGO		Flora and Fauna	Written Response	5.11
2098	NGO		Flora and Fauna	Written Response	5.11
2099	NGO		Flora and Fauna	Written Response	5.11
2100	NGO		Flora and Fauna	Written Response	5.11
2101	NGO		Flora and Fauna	Written Response	5.11
2102	NGO		Flora and Fauna	Written Response	5.11
2103	NGO		Flora and Fauna	Written Response	5.11
2104	NGO		Flora and Fauna	Written Response	5.11
2105	NGO		Flora and Fauna	Written Response	5.11
2106	NGO		Flora and Fauna	Written Response	5.11
2107	NGO		Flora and Fauna	Written Response	5.11
2108	NGO		Flora and Fauna	Written Response	5.11
2109	NGO		Flora and Fauna	Written Response	5.11
2110	NGO		PD - System Construction	Written Response	4.2
2111	NGO		Flora and Fauna	Written Response	5.11
2112	NGO		Hydrogeology / Geomorphology	Written Response	5.5
2113	NGO		Hydrogeology / Geomorphology	Written Response	5.8
2114	NGO		Hydrogeology / Geomorphology	Written Response	5.5
2115	NGO		Hydrogeology / Geomorphology	Written Response	5.8
2116	NGO		Hydrogeology / Geomorphology	Written Response	5.14
2117	NGO		PD - System Construction	Written Response	4.2
2118	NGO		PD - System Construction	Written Response	4.2
2119	NGO		PD - System Construction	Written Response	4.2

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2120	NGO		PD - System Construction	Written Response	4.2
2121	NGO		Unplanned Events	Written Response	4.9
2122	NGO		Unplanned Events	Written Response	4.9
2123	NGO		PD - Testing & Commissioning	Written Response	4.3
2124	NGO		Unplanned Events	Written Response	4.9
2125	NGO		PD - Ops Control & Maintenance	Written Response	4.5
2126	NGO		Flora and Fauna	Written Response	5.11
2127	NGO		PD - Reinstate & Erosion	Written Response	4.4
2128	NGO		Route	Written Response	3
2129	NGO		PD - Reinstate & Erosion	Written Response	4.4
2130	NGO		PD - Reinstate & Erosion	Written Response	4.4
2131	NGO		PD - Reinstate & Erosion	Written Response	4.4
2132	NGO		Hydrogeology / Geomorphology	Written Response	5.5
2133	NGO		Air Quality	Written Response	5.3
2134	NGO		PD - System Construction	Written Response	4.2
2135	NGO		PD - System Construction	Written Response	4.2
2136	NGO		PD - System Construction	Written Response	4.2
2137	NGO		Unplanned Events	Written Response	4.9
2138	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2139	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2140	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5, 5.8
2141	Government and Regulators		PD - System Construction	Written Response	4.2
2142	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2143	Government and Regulators		Oil Spill Modelling	Written Response	5.14
2144	Government and Regulators	Baseline	PD - System Construction	Written Response	4.2
2145	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
2146	Government and Regulators		Geohazards	Written Response	5.5
2147	Government and Regulators		Construction - Environment	Written Response	4.5
2148	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
2149	Government and Regulators		Route	Written Response	5.5
2150	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
2151	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2152	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2153	Government and Regulators		Seismicity	Written Response	5.5
2154	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2155	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2156	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
2157	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2158	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2159	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2160	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2161	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2162	Government and Regulators		Seismicity	Written Response	5.5
2163	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
2164	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2165	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2166	Government and Regulators		Cumulative Impacts - Environment	Written Response	5.5
2167	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14

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2168	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2169	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2170	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2171	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2172	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2173	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2174	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2175	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2176	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2177	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
2178	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2179	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
2180	Government and Regulators		Support for Project	Written Response	4
2181	Government and Regulators		PD - System Construction	Written Response	4.2
2182	Government and Regulators		PD - Testing & Commissioning	Written Response	4.3
2183	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2184	Government and Regulators		Unplanned Events	Written Response	4.9
2185	Government and Regulators		Unplanned Events	Written Response	4.9
2186	Government and Regulators		Project Alternatives	Written Response	3
2187	Government and Regulators		Project Alternatives	Written Response	3
2188	Government and Regulators		PD - System Construction	Written Response	4.2
2189	Government and Regulators		Construction - Environment	Written Response	4.5
2190	Government and Regulators		geohazards	Written Response	5.5
2191	Government and Regulators		Unplanned Events	Written Response	4.9
2192	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2193	Government and Regulators		Unplanned Events	Written Response	5.2
2194	Government and Regulators		geohazards	Written Response	5.2, 5.5
2195	Government and Regulators		water environmental	Written Response	5.14
2196	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2197	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2198	Government and Regulators	Water (social aspects)	Oil Spill Mitigation	Written Response	4.10, 5.5, 5.14, 6.8
2199	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2200	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2201	Government and Regulators		Waste / Waste Water	Written Response	4.8
2202	Government and Regulators		Flora and Fauna	Written Response	5.11
2203	Government and Regulators		Waste / Waste Water	Written Response	5.8
2204	Government and Regulators		Air Quality	Written Response	5.3
2205	Government and Regulators		Oil Spill Mitigation	Written Response	4.1, 8.2
2206	Government and Regulators		Consultation	Written Response	3
2207	Government and Regulators		Anthrax and Disease	Written Response	5.7, 8.2

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2208	Government and Regulators		water environmental	Written Response	5.8
2209	Government and Regulators		Noise	Written Response	5.4
2210	Government and Regulators		Flora and Fauna	Written Response	8.2
2211	Government and Regulators		Flora and Fauna	Written Response	5.11
2212	Government and Regulators		Flora and Fauna	Written Response	5.11
2213	Government and Regulators		water environmental	Written Response	5.14
2214	Government and Regulators	Reinstatement	Forests	Written Response	5.11, 6.7
2215	Government and Regulators		Soil	Written Response	5.6, 6.7
2216	Government and Regulators	Reinstatement	Environmental Investment Programme	Written Response	8.2, 6.7
2217	Government and Regulators	Community Investment Programme	Waste / Waste Water	Written Response	8.2, 6.13
2218	Government and Regulators	Community Investment Programme	Waste / Waste Water	Written Response	8.2, 6.13
2219	Government and Regulators		Environmental Monitoring	Written Response	5.7
2220	Government and Regulators		Anthrax and Disease	Written Response	5.7
2221	Government and Regulators		Waste / Waste Water	Written Response	4.8
2222	Government and Regulators		Waste / Waste Water	Written Response	4.8
2223	Government and Regulators		Waste / Waste Water	Written Response	5.7
2224	Government and Regulators		Waste / Waste Water	Written Response	5.7, 5.14
2225	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2226	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2227	Government and Regulators		Project Alternatives	Written Response	3
2228	Government and Regulators		Project Alternatives	Written Response	3
2229	Government and Regulators		Emissions	Written Response	5.3
2230	Government and Regulators		Project Alternatives	Written Response	3
2231	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2232	Government and Regulators		Seismicity	Written Response	5.5
2233	Government and Regulators		Seismicity	Written Response	5.5
2234	Government and Regulators		Seismicity	Written Response	5.5
2235	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.10
2236	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.10
2237	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.10
2238	Government and Regulators	Community Investment Programme	Archaeology & Cultural Heritage	Written Response	5.10, 6.13
2239	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.10
2240	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.10
2241	Government and Regulators		Climate	Written Response	5.2
2242	Government and Regulators		Surface Water (rivers and lakes)	Written Response	5.8
2243	Government and Regulators		Surface Water (rivers and lakes)	Written Response	5.8
2244	Government and Regulators		Geohazards	Written Response	5.5
2245	Government and Regulators		Geohazards	Written Response	5.5
2246	Government and Regulators		Geohazards	Written Response	5.5
2247	Government and Regulators		Surface Water (rivers and lakes)	Written Response	5.8

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2248	Government and Regulators		Geohazards	Written Response	5.5
2249	Government and Regulators		Environmental Monitoring	Written Response	8.2
2250	Government and Regulators		Environmental Monitoring	Written Response	8.2
2251	Government and Regulators		Soil	Written Response	5.7
2252	Government and Regulators		water environmental	Written Response	5.8
2253	Government and Regulators		Air Quality	Written Response	5.3
2254	Government and Regulators		Unplanned Events	Written Response	4.9
2255	Government and Regulators		Emissions / Dust	Written Response	5.3
2256	Government and Regulators		Oil Spill Modelling	Written Response	5.11, 5.14
2257	Government and Regulators		Oil Spill Modelling	Written Response	5.14
2258	Government and Regulators		Oil Spill Modelling	Written Response	5.14
2259	Government and Regulators		Air Quality	Written Response	5.3
2260	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2261	Government and Regulators		Unplanned events	Written Response	4.9
2262	Government and Regulators		Project Alternatives	Written Response	3
2263	Government and Regulators		Approach & Methodology	Written Response	3
2264	Government and Regulators		Seismicity	Written Response	5.5
2265	Government and Regulators		Waste / Waste Water	Written Response	4.8
2266	Government and Regulators		Waste / Waste Water	Written Response	4.8
2267	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2268	Government and Regulators		PD - Outline of Pipeline & Facilities	Written Response	4.2
2269	Government and Regulators		Noise	Written Response	5.4
2270	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2271	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2272	Government and Regulators		Waste / Waste Water	Written Response	4.8
2273	Government and Regulators		Emissions / Dust	Written Response	4.2
2274	Government and Regulators		Noise	Written Response	5.4
2275	Government and Regulators		Cumulative Impacts - environment	Written Response	7.2
2276	Government and Regulators		Emissions / Dust	Written Response	5.12
2277	Government and Regulators		Noise	Written Response	5.4
2278	Government and Regulators		Oil Spill Mitigation	Written Response	4.9
2279	Government and Regulators		Noise	Written Response	5.4
2280	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2281	Government and Regulators		Seismicity	Written Response	5.5
2282	Government and Regulators		Seismicity	Written Response	5.5
2283	Government and Regulators		Noise	Written Response	5.4
2284	Government and Regulators		Surface Water (rivers and lakes)	Written Response	5.8
2285	Government and Regulators		Environmental Monitoring	Written Response	5.8
2286	Government and Regulators	Baseline	water environmental	Written Response	5.8, 6.4
2287	Government and Regulators		water environmental	Written Response	5.8

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2288	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
2289	Government and Regulators		Construction - Environment	Written Response	4.5
2290	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
2291	Government and Regulators		water environmental	Written Response	5.14
2292	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.14
2293	Government and Regulators		Project Description	Written Response	4
2294	Government and Regulators		Geohazards	Written Response	5.5
2295	Government and Regulators		Forests	Written Response	5.11
2296	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2297	Government and Regulators		Project Description	Written Response	8.2
2298	Government and Regulators		Project Description	Written Response	7.2
2299	Government and Regulators		Oil Spill Modelling	Written Response	5.14
2300	Government and Regulators		Oil Spill Modelling	Written Response	5.8, 5.14
2301	Government and Regulators		Surface Water (rivers and lakes)	Written Response	5.8
2302	Government and Regulators		Unplanned events	Written Response	4.9
2303	Government and Regulators		Oil Spill Modelling	Written Response	4.1
2304	Government and Regulators		Cumulative Impacts - environment	Written Response	7
2305	Government and Regulators		Environmental Management Plans	Written Response	8.2
2306	Government and Regulators		Environmental Management Plans	Written Response	8.2
2307	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2308	Government and Regulators		Environmental Monitoring	Written Response	8.2
2309	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2310	Government and Regulators		Environmental Monitoring	Written Response	8.2
2311	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2312	Government and Regulators		Cumulative Impacts - environment	Written Response	7.2
2313	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
2314	Government and Regulators		Environmental Management Plans	Written Response	8.2
2315	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
2316	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2317	Government and Regulators		Construction - Environment	Written Response	8.2
2318	Government and Regulators		Legal Compliance (standards) - environment	Written Response	4
2319	Government and Regulators		Project Description	Written Response	5.8
2320	Government and Regulators		Emissions / Dust	Written Response	8.2
2321	Government and Regulators		Environmental Management Plans	Written Response	8.2
2322	Government and Regulators		Waste / Waste Water	Written Response	4.8
2323	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
2324	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
2325	Government and Regulators		Environmental Management Plans	Written Response	8.2
2326	Government and Regulators		Approach & Methodology	Written Response	3
2327	Government and Regulators		Protected Areas	Written Response	5.12

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2328	Government and Regulators		Project Description	Written Response	5.12
2329	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	5.12, 6.11
2330	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	8.2, 6.11
2331	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	8.2, 6.11
2332	Government and Regulators		Climate	Written Response	5.2
2333	Government and Regulators		Project Description	Written Response	5.2, 5.7
2334	Government and Regulators		Unplanned events	Written Response	4.9
2335	Government and Regulators		Climate	Written Response	5.2
2336	Government and Regulators		Environmental Management Plans	Written Response	8
2337	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
2338	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	6.11
2339	Government and Regulators		Project Description	Written Response	4
2340	Government and Regulators		Climate	Written Response	5.2
2341	Government and Regulators		Legal Compliance (standards) - environment	Written Response	4
2342	Government and Regulators		Project Description	Written Response	4
2343	Government and Regulators		Cumulative Impacts - environment	Written Response	7.2
2344	Government and Regulators		Project Description	Written Response	5.9
2345	Government and Regulators		Climate	Written Response	5.2
2346	Government and Regulators		Climate	Written Response	5.2
2347	Government and Regulators		Erosion	Written Response	4.4
2348	Government and Regulators		Project Description	Written Response	5.9
2349	Government and Regulators		Oil Spill Modelling	Written Response	5.6
2350	Government and Regulators		Cumulative Impacts - environment	Written Response	5.9, 7.2
2351	Government and Regulators		Project Alternatives	Written Response	3
2352	Government and Regulators		Climate	Written Response	5.2
2353	Government and Regulators		Soil	Written Response	5.6
2354	Government and Regulators		PD - Decommissioning	Written Response	4.6
2355	Government and Regulators		PD - Decommissioning	Written Response	4.6
2356	Government and Regulators		Soil	Written Response	5.6
2357	Government and Regulators		Soil	Written Response	5.6
2358	Government and Regulators		Approach and Methodology	Written Response	5.6
2359	Government and Regulators		Approach and Methodology	Written Response	5.6
2360	Government and Regulators		Geohazards	Written Response	5.5
2361	Government and Regulators		Geohazards	Written Response	5.5
2362	Government and Regulators		Project Alternatives	Written Response	3
2363	Government and Regulators		Geohazards	Written Response	5.5
2364	Government and Regulators		Geohazards	Written Response	5.5
2365	Government and Regulators		Geohazards	Written Response	5.5
2366	Government and Regulators		Geohazards	Written Response	5.5
2367	Government and Regulators		Erosion	Written Response	4.4

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2368	Government and Regulators		Geohazards	Written Response	5.5
2369	Government and Regulators		Erosion	Written Response	4.4
2370	Government and Regulators	Consultation	Consultation	Written Response	6.9
2371	Government and Regulators		Geohazards	Written Response	5.5
2372	Government and Regulators		Geohazards	Written Response	5.5
2373	Government and Regulators		Erosion	Written Response	5.5
2374	Government and Regulators		Geohazards	Written Response	5.5
2375	Government and Regulators		Geohazards	Written Response	5.5
2376	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
2377	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
2378	Government and Regulators		Project Description	Written Response	4
2379	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
2380	Government and Regulators		Geohazards	Written Response	5.8
2381	Government and Regulators		Erosion	Written Response	4.4
2382	Government and Regulators		Soil	Written Response	5.6
2383	Government and Regulators		Construction - Environment	Written Response	4.5
2384	Government and Regulators		Consultation	Written Response	4.5
2385	Government and Regulators		Geohazards	Written Response	5.2, 5.8
2386	Government and Regulators		Environmental Monitoring	Written Response	8.2
2387	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
2388	Government and Regulators	Community Investment Programme	Environmental Investment Programme	Written Response	5.8, 6.13
2389	Government and Regulators		Unplanned events	Written Response	5.8
2390	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
2391	Government and Regulators		Construction - Environment	Written Response	4.5
2392	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2393	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
2394	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
2395	Government and Regulators		Environmental Monitoring	Written Response	8
2396	Government and Regulators		Construction - Environment	Written Response	4.5
2397	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
2398	Government and Regulators		Environmental Monitoring	Written Response	8
2399	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2400	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2401	Government and Regulators		Oil Spill Mitigation	Written Response	5.5
2402	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2403	Government and Regulators		Construction - Environment	Written Response	4.5
2404	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2405	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2406	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2407	Government and Regulators		Oil Spill Mitigation	Written Response	5.14

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2408	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2409	Government and Regulators	Water (social aspects)	Oil Spill Mitigation	Written Response	5.14, 6.8
2410	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2411	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2412	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2413	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2414	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2415	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
2416	Government and Regulators	Water (social aspects)	Hydrogeology / Geomorphology	Written Response	5.8, 5.14, 6.8
2417	Government and Regulators		Legal compliance (standards) - environment	Written Response	5.12
2418	Government and Regulators		Construction - Environment	Written Response	8.2
2419	Government and Regulators		Hydrogeology / Geomorphology	Written Response	8.2
2420	Government and Regulators		Support for Project	Written Response	4
2421	Government and Regulators		Flora and Fauna	Written Response	5.11
2422	Government and Regulators		Flora and Fauna	Written Response	5.11
2423	Government and Regulators		Flora and Fauna	Written Response	5.11
2424	Government and Regulators		Flora and Fauna	Written Response	5.11
2425	Government and Regulators		Flora and Fauna	Written Response	5.11
2426	Government and Regulators		Flora and Fauna	Written Response	5.11
2427	Government and Regulators		erosion	Written Response	4.4
2428	Government and Regulators		Flora and Fauna	Written Response	5.11
2429	Government and Regulators		Flora and Fauna	Written Response	8.2
2430	Government and Regulators		Flora and Fauna	Written Response	5.11
2431	Government and Regulators		Construction - Environment	Written Response	4.5
2432	Government and Regulators		Construction - Environment	Written Response	4.5
2433	Government and Regulators		Flora and Fauna	Written Response	5.11
2434	Government and Regulators		Flora and Fauna	Written Response	5.11
2435	Government and Regulators		Flora and Fauna	Written Response	5.11
2436	Government and Regulators		Flora and Fauna	Written Response	5.11
2437	Government and Regulators		Landscape / Visual Impacts	Written Response	5.9
2438	Government and Regulators		Flora and Fauna	Written Response	5.11, 5.14
2439	Other Organisation		route	Written Response	3
2440	Other Organisation		route	Written Response	3
2441	Other Organisation		water environmental	Written Response	5.5
2442	Other Organisation		Construction - Environment	Written Response	5.11, 5.14
2443	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.5
2444	Other Organisation		Soil	Written Response	5.6
2445	Other Organisation		geohazards	Written Response	5.5
2446	Other Organisation		geohazards	Written Response	5.5
2447	Other Organisation		erosion	Written Response	5.5
2448	Other Organisation		water environmental	Written Response	5.5, 5.8
2449	Other Organisation		water environmental	Written Response	5.5, 5.6, 5.8
2450	Other Organisation		oil spill modelling	Written Response	5.5, 5.14
2451	Other Organisation		waste	Written Response	4.8
2452	Other Organisation		Flora and Fauna	Written Response	5.11
2453	Other Organisation		forests	Written Response	8.2, 5.11
2454	Other Organisation		Flora and Fauna	Written Response	5.11
2455	Other Organisation		forests	Written Response	5.11

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2456	Other Organisation		Flora and Fauna	Written Response	5.9, 5.11
2457	Other Organisation		water environmental	Written Response	5.8
2458	Other Organisation		climate	Written Response	5.2
2459	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8, 5.14
2460	Other Organisation		legal compliance (standards) - environment	Written Response	5.12
2461	Other Organisation		oil spill modelling	Written Response	5.5, 5.14
2462	Other Organisation		route	Written Response	3
2463	Other Organisation		cumulative impacts - environment	Written Response	5.5
2464	Other Organisation		unplanned events	Written Response	4.9
2465	Other Organisation		cumulative impacts - environment	Written Response	7.2
2466	Other Organisation		seismicity	Written Response	5.5
2467	Other Organisation		water environmental	Written Response	5.8
2468	Other Organisation		Oil Spill Mitigation	Written Response	5.14
2469	Other Organisation		geohazards	Written Response	5.5
2470	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.5, 5.8
2471	Other Organisation		Project Description	Written Response	4
2472	Other Organisation		Project Description	Written Response	4
2473	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2474	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2475	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2476	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2477	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2478	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2479	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2480	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2481	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2482	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2483	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2484	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2485	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2486	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2487	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2488	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2489	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2490	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2491	Other Organisation		Support for Project	Written Response	5.1
2492	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2493	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2494	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2495	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2496	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2497	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2498	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2499	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2500	Other Organisation	Employment		Written Response	6.6
2501	Other Organisation	Employment		Written Response	6.6
2502	Other Organisation	Employment		Written Response	6.6
2503	Other Organisation	Employment		Written Response	6.6
2504	Other Organisation	Land Acquisition and Compensation		Written Response	6.7

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2505	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2506	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2507	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2508	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2509	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2510	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2511	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2512	Other Organisation	Infrastructure, Transport, Roads		Written Response	6.8
2513	Other Organisation	Access to Energy		Written Response	6.8
2514	Other Organisation		Waste / Waste Water	Written Response	4.8
2515	Other Organisation		PD - System Construction	Written Response	4.2
2516	Other Organisation	Health		Written Response	6.13
2517	Other Organisation	Land Acquisition and Compensation		Written Response	
2518	Other Organisation	Demography and Ethnicity		Written Response	6.9
2519	Other Organisation	Security		Written Response	6.10, 6.14
2520	Other Organisation	Community Investment Programme		Written Response	6.13
2521	Other Organisation	Cumulative and Residual Impacts		Written Response	6.12, 6.14
2522	Other Organisation	Cumulative and Residual Impacts		Written Response	6.12
2523	Other Organisation	Safety		Written Response	6.8, 6.10
2524	Other Organisation	Employment		Written Response	6.6
2525	Other Organisation	Consultation		Written Response	6.9
2526	Other Organisation	Data Collection		Written Response	6.3
2527	Other Organisation	Baseline		Written Response	6.3
2528	Other Organisation	Consultation		Written Response	6.9
2529	Other Organisation	Demography and Ethnicity		Written Response	6.3
2530	Other Organisation	Employment		Written Response	6.6
2531	Other Organisation	Employment		Written Response	6.6
2532	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2533	Other Organisation		Waste / Waste Water	Written Response	4.8
2534	Other Organisation	Consultation		Written Response	6.9
2535	Other Organisation	Consultation		Written Response	6.9
2536	Other Organisation	Employment		Written Response	6.6
2537	Other Organisation	Health		Written Response	6.13
2538	Other Organisation	Community Investment Programme		Written Response	6.13
2539	Other Organisation	Monitoring - Social		Written Response	8.3
2540	Other Organisation	Consultation		Written Response	6.9
2541	Government and Regulators	Consultation		Written Response	6.9
2542	Government and Regulators	Consultation		Written Response	6.3
2543	Government and Regulators	Consultation		Written Response	6.3
2544	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
2545	Government and Regulators	Cumulative and Residual Impacts		Written Response	6.12
2546	Government and Regulators	Employment		Written Response	6.6
2547	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
2548	Government and Regulators	Unplanned events		Written Response	6.10
2549	Government and Regulators	Tourism		Written Response	6.6
2550	Government and Regulators	Water (social aspects)		Written Response	6.8
2551	Government and Regulators	Water (social aspects)		Written Response	6.8
2552	Government and Regulators	Water (social aspects)		Written Response	6.8
2553	Government and Regulators	Water (social aspects)		Written Response	6.8
2554	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.14
2555	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.9

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2556	Government and Regulators		PD - Project Schedule	Written Response	4.2
2557	Government and Regulators	Consultation		Written Response	6.9
2558	Government and Regulators	Consultation		Written Response	6.3
2559	Government and Regulators	Consultation		Written Response	6.3
2560	Government and Regulators	Water (social aspects)		Written Response	6.8
2561	Government and Regulators		PD - Outline of Pipeline & Facilities	Written Response	4.2
2562	Government and Regulators	Land Use Restrictions		Written Response	6.7
2563	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
2564	Government and Regulators	Security		Written Response	6.10
2565	Private Individual	Employment		Feedback Form	6.6
2566	Private Individual	Tariffs		Feedback Form	6.2
2567	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2568	Private Individual	Access to Energy		Feedback Form	6.5
2569	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2570	Private Individual	Access to Energy		Feedback Form	6.5
2571	Private Individual	Water (social aspects)		Feedback Form	6.13
2572	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2573	Private Individual	Access to Energy		Feedback Form	6.5
2574	Private Individual	Other Compensation		Feedback Form	6.13
2575	Private Individual	Community Investment Programme		Feedback Form	6.13
2576	Private Individual	Access to Energy		Feedback Form	6.5
2577	Private Individual	Other Compensation		Feedback Form	6.13
2578	Private Individual	Employment		Feedback Form	6.6
2579	Private Individual	Employment		Feedback Form	6.9
2580	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2581	Private Individual		PD - Reinstate & Erosion	Feedback Form	4.4
2582	Private Individual	Employment		Feedback Form	6.6
2583	Private Individual	Community Investment Programme		Feedback Form	6.13
2584	Private Individual	General Construction Queries		Feedback Form	6.9
2585	Private Individual	Support for Project		Feedback Form	6.2
2586	Private Individual	Community Investment Programme		Feedback Form	6.13
2587	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2588	Private Individual	Employment		Feedback Form	6.6
2589	Private Individual	Land Use Restrictions		Feedback Form	6.7
2590	Private Individual		Oil spill modelling	Feedback Form	5.5, 5.14
2591	Private Individual	Employment		Feedback Form	6.6
2592	Private Individual	Access to Energy		Feedback Form	6.5
2593	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2594	Private Individual	Community Relations		Feedback Form	6.9
2595	Private Individual	Support for Project		Feedback Form	6.2
2596	Private Individual	Security		Feedback Form	6.10
2597	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2598	Private Individual	Support for Project		Feedback Form	6.2
2599	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2600	NGO	Tourism		NGO Workshop	6.6
2601	NGO	Consultation		NGO Workshop	6.9
2602	Government and Regulators		Environmental Management Plans	Written Response	8.2
2603	Government and Regulators		Environmental Management Plans	Written Response	8.2
2604	Government and Regulators	Employment	Geohazards	Written Response	5.5, 6.6
2605	Government and Regulators	Consultation		Written Response	6.9
2606	Government and Regulators	ESIA Documentation and Translation		Written Response	6.9
2607	Government and Regulators		Geohazards	Written Response	5.5
2608	Government and Regulators	Employment		Written Response	6.6

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2609	Other Organisation	Water (social aspects)	water environmental	Written Response	5,8 6.8
2610	Other Organisation	Water (social aspects)	water environmental	Written Response	5,8 6.8
2611	Other Organisation	Infrastructure, Transport, Roads		Written Response	6.8
2612	Other Organisation	Infrastructure, Transport, Roads	Noise	Written Response	5.4, 6.8
2613	Other Organisation	Water (social aspects)	Cumulative impacts - environment	Written Response	5.8, 5.11, 6.8
2614	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.14
2615	Other Organisation		water environmental	Written Response	5.14
2616	Other Organisation		water environmental	Written Response	5.14
2617	Other Organisation	Water (social aspects)	water environmental	Written Response	5.8, 6.8
2618	Other Organisation		Anthrax and Disease	Written Response	5.7
2619	Other Organisation		Anthrax	Written Response	5.7, 8.2
2620	Other Organisation	Water (social aspects)	water environmental	Written Response	5.14, 6.8
2621	Other Organisation	Water (social aspects)	water environmental	Written Response	5.8, 6.8
2622	Other Organisation		water environmental	Written Response	5.14
2623	Other Organisation	Baseline		Written Response	6.4
2624	Other Organisation	Baseline		Written Response	6.4, 6.3
2625	Other Organisation	Macroeconomics		Written Response	6.3
2626	Other Organisation	Baseline		Written Response	6.4
2627	Other Organisation	Health	Waste / Waste Water	Written Response	6.10
2628	Other Organisation	Baseline		Written Response	6.4
2629	Other Organisation	Health		Written Response	6.4
2630	Other Organisation	Employment		Written Response	6.4
2631	Other Organisation	Data Collection		Written Response	6.4
2632	Other Organisation	Baseline		Written Response	6.4
2633	Other Organisation	Livelihoods		Written Response	6.4
2634	Other Organisation	Baseline		Written Response	6.4
2635	Other Organisation	ESIA Documentation and Translation		Written Response	6.4
2636	Other Organisation	ESIA Documentation and Translation		Written Response	6.3
2637	Other Organisation	Macroeconomics		Written Response	6.3
2638	Other Organisation	Employment		Written Response	6.6
2639	Other Organisation	Employment		Written Response	6.6
2640	Other Organisation	Employment		Written Response	6.6
2641	Other Organisation	Employment		Written Response	6.6
2642	Other Organisation	Employment		Written Response	6.6
2643	Other Organisation	Employment		Written Response	6.6
2644	Other Organisation	Employment		Written Response	6.6
2645	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2646	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2647	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2648	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2649	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2650	NGO		Route	Written Response	3
2651	NGO		Approach and Methodology	Written Response	3
2652	NGO	Borjomi	water environmental	Written Response	5.14
2653	NGO	Monitoring - Social		Written Response	8.3
2654	NGO		Project Description	Written Response	4
2655	NGO		Project Description	Written Response	4
2656	NGO	Health		Written Response	6.10
2657	NGO	Baseline	water environmental	Written Response	5.8, 6.4
2658	NGO	Baseline	water environmental	Written Response	5.8, 6.4
2659	NGO		Waste / Waste Water	Written Response	5.8
2660	NGO		PD - System Construction	Written Response	4.2
2661	NGO		Anthrax	Written Response	5.7, 8.2
2662	NGO	Consultation		Written Response	6.9
2663	NGO	Consultation		Written Response	6.9
2664	NGO	Consultation		Written Response	6.9
2665	NGO	Consultation		Written Response	6.9
2666	NGO	Consultation		Written Response	6.9
2667	NGO	Consultation		Written Response	6.9
2668	NGO	Consultation		Written Response	6.9
2669	NGO	Consultation		Written Response	6.9
2670	NGO	Consultation		Written Response	6.9
2671	NGO	Consultation		Written Response	6.9
2672	NGO	Consultation		Written Response	6.9
2673	NGO	Land Acquisition and Compensation		Written Response	6.7
2674	NGO	Employment		Written Response	6.6
2675	NGO	Community Investment Programme		Written Response	6.13

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2676	NGO	ESIA Documentation and Translation		Written Response	6.3
2677	Private Individual	Community Investment Programme		Written Response	6.13
2678	NGO	Support for Project		Written Response	6.2
2679	NGO	Safety		Written Response	6.10
2680	NGO	Safety		Written Response	6.10
2681	NGO	Health		Written Response	6.10
2682	NGO	Safety		Written Response	6.10
2683	Private Individual		Project Description	Written Response	4
2684	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2685	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2686	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2687	Other Organisation	Infrastructure, Transport, Roads	Project Description	Written Response	6.8
2688	Other Organisation	Access to Energy		Written Response	6.8
2689	Other Organisation		Waste / Waste Water	Written Response	4.8
2690	Other Organisation		PD - System Construction	Written Response	4.2
2691	Other Organisation	Health		Written Response	6.13
2692	Other Organisation	ESIA Documentation and Translation		Written Response	
2693	Other Organisation	Demography and Ethnicity		Written Response	6.9
2694	Other Organisation	Security		Written Response	6.10
2695	Other Organisation	Community Investment Programme		Written Response	6.13
2696	Other Organisation	Cumulative and Residual Impacts	Cumulative impacts - environment	Written Response	6.12, 7.2
2697	Other Organisation	Cumulative and Residual Impacts	Cumulative impacts - environment	Written Response	6.12, 7.2
2698	Other Organisation	Safety		Written Response	6.8, 6.10
2699	Other Organisation	Employment		Written Response	6.6
2700	Other Organisation	Community Relations		Written Response	6.9
2701	Other Organisation	Baseline		Written Response	6.3
2702	Other Organisation	Baseline		Written Response	6.3
2703	Other Organisation	Community Relations		Written Response	6.9
2704	Other Organisation	Baseline		Written Response	6.4
2705	Other Organisation	Employment		Written Response	6.6
2706	Other Organisation	Employment		Written Response	6.6
2707	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2708	Other Organisation		Waste / Waste Water	Written Response	4.8
2709	Other Organisation	Community Relations		Written Response	6.9
2710	Other Organisation	Community Relations		Written Response	6.9
2711	Other Organisation	Employment		Written Response	6.6
2712	Other Organisation	Health		Written Response	6.13
2713	Other Organisation	Community Investment Programme		Written Response	6.13
2714	Other Organisation	Cumulative and Residual Impacts		Written Response	6.12
2715	Other Organisation	Community Relations		Written Response	6.9
2716	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.10, 5.12
2717	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2718	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2719	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2720	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2721	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2722	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2723	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2724	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2725	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2726	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2727	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2728	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2729	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1

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2730	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2731	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2732	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2733	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2734	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2735	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2736	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.10, 5.12
2737	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2738	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2739	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2740	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2741	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2742	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2743	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2744	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2745	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2746	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2747	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2748	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2749	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2750	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2751	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2752	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.10, 5.12
2753	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2754	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.12
2755	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.12
2756	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2757	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2758	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2759	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2760	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2761	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2762	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2763	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2764	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2765	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2766	Other Organisation		Archaeology & Cultural Heritage	Written Response	7.2
2767	Other Organisation		Archaeology & Cultural Heritage	Written Response	8.2
2768	Other Organisation		Archaeology & Cultural Heritage	Written Response	8.2
2769	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1

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2770	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.10, 8.2
2771	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.10, 8.2
2772	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.10, 8.2
2773	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2774	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2775	Private Individual	Access to Energy		Written Response	6.5
2776	Private Individual	Community Investment Programme		Written Response	6.13
2777	Private Individual	Community Investment Programme		Written Response	6.13
2778	NGO	Baseline		Written Response	6.9
2779	NGO	Consultation		Written Response	6.9
2780	NGO	Baseline		Written Response	5.14, 6.4
2781	NGO	Data collection		Written Response	6.9
2782	NGO	Access to Energy		Written Response	6.5
2783	NGO	Previous construction experience		Written Response	6.9
2784	NGO	Previous construction experience		Written Response	6.9
2785	NGO	Previous construction experience		Written Response	6.9
2786	NGO	Previous construction experience		Written Response	6.9
2787	NGO	Land Acquisition and Compensation		Written Response	6.7
2788	NGO	Government Relations		Written Response	6.9
2789	NGO	Community Investment Programme		Written Response	6.13
2790	NGO	Government Relations		Written Response	6.7
2791	NGO	Consultation		Written Response	6.9
2792	NGO	Land Acquisition and Compensation		Written Response	6.7
2793	NGO	Government Relations		Written Response	6.9
2794	NGO	Government Relations		Written Response	6.13
2795	NGO	Land Acquisition and Compensation		Written Response	6.7
2796	NGO	Government Relations		Written Response	6.9, 6.3
2797	NGO	Consultation		Written Response	6.9
2798	NGO	Other Compensation		Written Response	6.7, 6.9
2799	NGO	Previous construction experience		Written Response	6.9
2800	NGO	Previous construction experience		Written Response	6.9
2801	NGO	Previous construction experience		Written Response	6.9
2802	NGO	Previous construction experience		Written Response	6.9
2803	NGO	Previous construction experience		Written Response	6.9
2804	NGO	Previous construction experience		Written Response	6.9
2805	NGO	Consultation		Written Response	6.9
2806	NGO	Consultation		Written Response	6.9
2807	NGO	Consultation		Written Response	6.9
2808	NGO	Consultation		Written Response	6.9
2809	NGO	Data collection		Written Response	6.3
2810	NGO	Data collection		Written Response	6.3
2811	NGO	Community Investment Programme		Written Response	6.9
2812	NGO	Access to Energy		Written Response	6.5
2813	NGO	Previous construction experience		Written Response	6.9
2814	NGO	Previous construction experience		Written Response	6.9
2815	NGO	Employment		Written Response	6.6
2816	NGO	Previous construction experience		Written Response	6.9
2817	NGO	Land Acquisition and Compensation		Written Response	6.7
2818	NGO	Land Acquisition and Compensation		Written Response	6.7
2819	NGO	Land Acquisition and Compensation		Written Response	6.7
2820	NGO	Safety	Cumulative impacts - environment	Written Response	6.10, 7.2
2821	NGO	Consultation		Written Response	6.9

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2822	NGO	Issues around Borjomi		Written Response	5.14
2823	NGO	ESIA Documentation and Translation		Written Response	6.9
2824	NGO	Consultation		Written Response	6.9
2825	NGO	Consultation		Written Response	6.9
2826	NGO	Consultation		Written Response	6.9
2827	NGO	Consultation		Written Response	6.9
2828	NGO	Consultation		Written Response	6.9
2829	NGO	Consultation		Written Response	6.9
2830	NGO	Consultation		Written Response	6.9
2831	NGO	Consultation		Written Response	6.9
2832	NGO	Consultation		Written Response	6.9
2833	NGO	Land Acquisition and Compensation		Written Response	6.7
2834	NGO	Consultation		Written Response	6.9
2835	NGO	ESIA Documentation and Translation		Written Response	6.9
2836	NGO	Consultation		Written Response	6.9
2837	NGO	Consultation		Written Response	6.9
2838	NGO	Data collection		Written Response	6.3
2839	NGO	Consultation		Written Response	6.9
2840	NGO	Consultation		Written Response	6.9
2841	NGO	Consultation		Written Response	6.9
2842	NGO	Consultation		Written Response	6.3
2843	NGO	Consultation		Written Response	6.9
2844	NGO	Consultation		Written Response	6.9
2845	NGO	Consultation		Written Response	6.9
2846	NGO	Consultation		Written Response	6.9
2847	NGO	Consultation		Written Response	6.9
2848	NGO	Data collection		Written Response	6.3
2849	NGO	Data collection		Written Response	6.3
2850	NGO	Employment		Written Response	6.6
2851	NGO	Access to Energy		Written Response	6.5
2852	NGO	Community Investment Programme		Written Response	6.13
2853	NGO	Access to Energy		Written Response	6.5
2854	NGO	Access to Energy		Written Response	6.5
2855	NGO	Access to Energy		Written Response	6.5
2856	NGO	Access to Energy		Written Response	6.5
2857	NGO	Community Investment Programme		Written Response	6.13
2858	NGO	Community Investment Programme		Written Response	6.13
2859	NGO	Water (social aspects)		Written Response	6.8
2860	NGO	Employment		Written Response	6.9
2861	NGO	Employment		Written Response	6.9
2862	NGO	Employment		Written Response	6.6
2863	NGO	Employment		Written Response	6.6
2864	NGO	Employment		Written Response	6.6
2865	NGO	Employment		Written Response	6.9
2866	NGO	Land Acquisition and Compensation		Written Response	6.7
2867	NGO	Land Acquisition and Compensation		Written Response	6.7
2868	NGO	Land Acquisition and Compensation		Written Response	6.7
2869	NGO	Land Acquisition and Compensation		Written Response	6.7
2870	NGO	Land Acquisition and Compensation		Written Response	6.7
2871	NGO	Reinstatement	Oil Spill Mitigation	Written Response	5.14, 6.7, 6.7
2872	NGO	Land Acquisition and Compensation		Written Response	6.7
2873	NGO	Land Acquisition and Compensation		Written Response	6.7
2874	NGO	Land Acquisition and Compensation		Written Response	6.7
2875	NGO	Safety		Written Response	6.10
2876	NGO	Security		Written Response	6.10
2877	NGO	Safety		Written Response	6.10
2878	NGO	Issues around Borjomi		Written Response	5.14
2879	NGO	Baseline	water environmental	Written Response	5.11, 6.4
2880	NGO	Government Relations		Written Response	6.9
2881	NGO	Consultation		Written Response	6.9
2882	NGO	Consultation		Written Response	6.9
2883	NGO	Land Acquisition and Compensation		Written Response	6.7
2884	NGO	Consultation		Written Response	6.9
2885	NGO	Baseline	water environmental	Written Response	5.11, 5.14, 6.4
2886	NGO	ESIA Documentation and Translation		Written Response	6.9

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
2887	Private Individual	Employment		Feedback Form	6.6
2888	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2889	Private Individual	Consultation		Feedback Form	6.9
2890	Private Individual	Employment		Feedback Form	6.6
2891	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2892	Private Individual	Employment		Feedback Form	6.6
2893	Private Individual	Consultation		Feedback Form	6.9
2894	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2895	Private Individual	Consultation		Feedback Form	6.9
2896	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2897	Private Individual	Community Investment Programme		Feedback Form	6.13
2898	Private Individual	Macroeconomics		Feedback Form	6.2
2899	Private Individual	Employment		Feedback Form	6.6
2900	Private Individual	Procurement		Feedback Form	6.6
2901	Private Individual		PD - Project Design Basis	Feedback Form	4.1
2902	Private Individual	Consultation		Feedback Form	6.9, 6.6
2903	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2904	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2905	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2906	Private Individual	Safety		Feedback Form	6.10
2907	Private Individual	Employment		Feedback Form	6.6
2908	Private Individual	Consultation		Feedback Form	6.9
2909	Private Individual	Employment		Feedback Form	6.6
2910	Private Individual	Employment		Feedback Form	6.6
2911	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2912	Private Individual		Construction - environment	Feedback Form	8.2
2913	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2914	Private Individual	Employment		Feedback Form	6.6
2915	Private Individual	Consultation		Feedback Form	6.9
2916	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2917	Private Individual		Environmental Management Plans	Feedback Form	8.2
2918	Private Individual	Employment		Feedback Form	6.6
2919	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2920	Private Individual	Consultation		Feedback Form	6.9
2921	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2922	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2923	Private Individual		Construction - Environment	Feedback Form	8.2
2924	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2925	Private Individual	Employment		Feedback Form	6.6
2926	Private Individual	Consultation		Feedback Form	6.9
2927	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2928	Private Individual		Construction - Environment	Feedback Form	5.14, 8.2
2929	Private Individual	Employment		Feedback Form	6.6, 6.8
2930	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2931	Private Individual	Consultation		Feedback Form	6.9
2932	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2933	Private Individual		Environmental Monitoring	Feedback Form	5.12, 8.2
2934	Private Individual	Employment		Feedback Form	6.6
2935	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2936	Private Individual	Consultation		Feedback Form	6.9
2937	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2938	Private Individual	Employment		Feedback Form	6.6
2939	Private Individual	Other Compensation		Feedback Form	6.8
2940	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2941	Private Individual	Consultation		Feedback Form	6.9
2942	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
2943	Private Individual	Employment		Feedback Form	6.6
2944	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2945	Private Individual		Construction - Environment	Feedback Form	5.7, 8.2
2946	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2947	Private Individual	Access to Energy		Feedback Form	6.5
2948	Private Individual	Access to Energy		Feedback Form	6.5
2949	Private Individual	Community Investment Programme	Environmental Investment Programme	Feedback Form	8.2, 5.11, 6.13
2950	Private Individual	Previous construction experience		Feedback Form	6.9
2951	Private Individual	Previous construction experience		Feedback Form	6.9
2952	Private Individual	Water (social aspects)	Environmental Investment Programme	Feedback Form	6.8, 8.2
2953	Private Individual	Access to Energy	Environmental Investment Programme	Feedback Form	6.5, 8.2
2954	Private Individual	Infrastructure, Transport, Roads	Environmental Investment Programme	Feedback Form	6.8, 8.2
2955	Private Individual	Community Investment Programme		Feedback Form	6.13
2956	Private Individual	Community Investment Programme		Feedback Form	6.13
2957	Private Individual	Previous construction experience		Feedback Form	6.9
2958	Private Individual	Health		Feedback Form	6.10
2959	Private Individual	Land Acquisition and Compensation		Road show	6.7
2960	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
2961	Private Individual	Procurement		Public Meeting	6.6
2962	Private Individual	Monitoring - Social	Environmental Monitoring	Public Meeting	8.2, 8.3
2963	NGO	Safety	Environmental Monitoring	Public Meeting	6.10, 8.2
2964	NGO	Health		Public Meeting	6.10
2965	NGO	International Standards and Legal Compliance (social)		Public Meeting	6.11
2966	Private Individual	Access to Energy		Feedback Form	6.5
2967	Private Individual	Employment		Feedback Form	6.6
2968	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2969	Private Individual		Route	Feedback Form	6.7
2970	Private Individual	Procurement		Feedback Form	6.6
2971	Private Individual	Safety		Feedback Form	6.10
2972	Private Individual		Soil	Feedback Form	5.6
2973	Private Individual		Soil	Feedback Form	5.6
2974	Private Individual		PD - Reinstate & Erosion	Feedback Form	4.4
2975	Private Individual	Support for Project		Feedback Form	6.13
2976	Private Individual	Employment		Feedback Form	6.6
2977	Private Individual		Construction - Environment	Feedback Form	5.11
2978	Private Individual		Soil	Feedback Form	5.6
2979	Private Individual	Access to Energy		Feedback Form	6.5
2980	Private Individual	Community Investment Programme		Feedback Form	6.13
2981	Private Individual	Community Investment Programme		Feedback Form	6.13
2982	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2983	Private Individual	Access to Energy		Feedback Form	6.5
2984	Private Individual	Employment		Feedback Form	6.6
2985	Private Individual	Community Investment Programme		Feedback Form	6.13
2986	Private Individual	Community Investment Programme		Feedback Form	6.13
2987	NGO	Employment		Written Response	6.9
2988	Number not used				
2989	Number not used				
2990	Number not used				
2991	Number not used				
2992	Number not used				
2993	Number not used				
2994	Number not used				
2995	Number not used				
2996	Number not used				
2997	Number not used				
2998	Number not used				
2999	Number not used				
3000	Government and Regulators	Water (social aspects)	water environmental	Written Response	5.5, 6.8

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
3001	Government and Regulators	Water (social aspects)	water environmental	Written Response	5.14, 6.8
3002	Government and Regulators		water environmental	Written Response	5.14
3003	Government and Regulators	Water (social aspects)	water environmental	Written Response	5.8, 6.8
3004	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
3005	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
3006	Government and Regulators	Issues around Borjomi		Written Response	5.14
3007	Government and Regulators	Issues around Borjomi		Written Response	5.14
3008	Government and Regulators	Issues around Borjomi		Written Response	5.14
3009	Government and Regulators	Water (social aspects)		Written Response	6.8
3010	Government and Regulators	Water (social aspects)		Written Response	6.8
3011	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.14
3012	Government and Regulators	Water (social aspects)		Written Response	6.8
3013	Government and Regulators	Security	Environmental Risk Assessment	Written Response	6.10
3014	Government and Regulators	Previous Construction Experience		Written Response	6.9
3015	Government and Regulators		Cumulative Impacts - Environment	Written Response	7.2
3016	Government and Regulators	Water (social aspects)		Written Response	6.8
3017	Government and Regulators	Water (social aspects)		Written Response	6.8
3018	Government and Regulators	Water (social aspects)		Written Response	6.8
3019	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3020	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3021	Government and Regulators		Geohazards	Written Response	5.5
3022	Government and Regulators		Route	Written Response	3
3023	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3024	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3025	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3026	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3027	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3028	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3029	Government and Regulators		Unplanned events	Written Response	7.2
3030	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3031	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3032	Government and Regulators		Unplanned events	Written Response	7.2
3033	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
3034	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
3035	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3036	Government and Regulators		Soil	Written Response	5.6
3037	Government and Regulators		Consultation	Written Response	3
3038	Government and Regulators		Soil	Written Response	5.6
3039	Government and Regulators		Soil	Written Response	5.6
3040	Government and Regulators		Erosion	Written Response	4.4

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
3041	Government and Regulators		Approach & Methodology	Written Response	3
3042	Government and Regulators		Construction - Environment	Written Response	4.5
3043	Government and Regulators		Approach & Methodology	Written Response	3
3044	Government and Regulators		Route	Written Response	3
3045	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3046	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3047	Government and Regulators		Approach & Methodology	Written Response	3
3048	Government and Regulators		Erosion	Written Response	4.4
3049	Government and Regulators		Geohazards	Written Response	5.5
3050	Government and Regulators		water environmental	Written Response	5.8
3051	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
3052	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3053	Government and Regulators		Erosion	Written Response	4.4
3054	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3055	Government and Regulators		Erosion	Written Response	4.4
3056	Government and Regulators		Approach & Methodology	Written Response	3
3057	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3058	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3059	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3060	Government and Regulators		Climate	Written Response	5.2
3061	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3062	Government and Regulators		Geohazards	Written Response	5.5
3063	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3064	Government and Regulators		Erosion	Written Response	4.4
3065	Government and Regulators		Environmental Monitoring	Written Response	8.2
3066	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3067	Government and Regulators		Project Description	Written Response	4
3068	Government and Regulators		Geohazards	Written Response	5.5
3069	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3070	Government and Regulators		Geohazards	Written Response	5.5
3071	Government and Regulators		Project Description	Written Response	4
3072	Government and Regulators		Geohazards	Written Response	5.5
3073	Government and Regulators		Oil Spill Mitigation	Written Response	4.9
3074	Government and Regulators		Erosion	Written Response	4.4
3075	Government and Regulators		Project Description	Written Response	4
3076	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
3077	Government and Regulators	Infrastructure, Transport, Roads	PD - Project Design Basis	Written Response	4.1
3078	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3079	Government and Regulators		Waste / Waste water	Written Response	4.8
3080	Government and Regulators		Geohazards	Written Response	5.5

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
3081	Government and Regulators		Project Alternatives	Written Response	3
3082	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
3083	Government and Regulators		Landscape / visual impacts	Written Response	5.8
3084	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.9
3085	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.14
3086	Government and Regulators	Tourism	Archaeology & Cultural Heritage	Written Response	5.1, 6.6
3087	Government and Regulators		Landscape / visual impacts	Written Response	5.9
3088	Government and Regulators		Project Alternatives	Written Response	3
3089	Government and Regulators		Approach & Methodology	Written Response	3
3090	Government and Regulators		Geohazards	Written Response	5.5
3091	Government and Regulators		Project Description	Written Response	4
3092	Government and Regulators		Approach & Methodology	Written Response	3
3093	Government and Regulators	Consultation	Approach & Methodology	Written Response	6.9
3094	Government and Regulators		Soil	Written Response	5.6
3095	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
3096	Government and Regulators		water environmental	Written Response	5.8
3097	Government and Regulators		Landscape / visual impacts	Written Response	5.9
3098	Government and Regulators		Unplanned events	Written Response	4.9
3099	Government and Regulators		Geohazards	Written Response	5.5
3100	Government and Regulators		Cumulative Impacts - Environment	Written Response	7.2
3101	Government and Regulators		Geohazards	Written Response	5.5
3102	Government and Regulators		Cumulative Impacts - Environment	Written Response	7
3103	Government and Regulators		Cumulative Impacts - Environment	Written Response	7
3104	Government and Regulators		Project Description	Written Response	4
3105	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3106	Government and Regulators		Geohazards	Written Response	5.5
3107	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
3108	Government and Regulators		Geohazards	Written Response	5.5
3109	Government and Regulators		Project Description	Written Response	5.11
3110	Government and Regulators		Geohazards	Written Response	5.5
3111	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.5, 5.8
3112	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3113	Government and Regulators		Soil	Written Response	5.6
3114	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.6
3115	Government and Regulators		Construction - Environment	Written Response	7
3116	Government and Regulators		Project Description	Written Response	4
3117	Government and Regulators		Climate	Written Response	5.2
3118	Government and Regulators		Route	Written Response	3
3119	Government and Regulators		Climate	Written Response	5.2
3120	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
3121	Government and Regulators		Oil Spill Modelling	Written Response	5.5
3122	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3123	Government and Regulators		Oil Spill Modelling	Written Response	5.14
3124	Government and Regulators		Route	Written Response	3
3125	Government and Regulators		Project Alternatives	Written Response	3
3126	Government and Regulators	Water (social aspects)		Written Response	6.13
3127	Government and Regulators	Water (social aspects)		Written Response	6.13
3128	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.8
3129	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.13
3130	Government and Regulators	Water (social aspects)		Written Response	6.13
3131	Government and Regulators	Procurement		Written Response	6.6
3132	Government and Regulators	Procurement		Written Response	6.6
3133	Government and Regulators	Community Investment Programme		Written Response	6.13
3134	Government and Regulators	Procurement		Written Response	6.6
3135	NGO	Community Relations	Oil Spill Modelling	Written Response	6.9
3136	NGO		Oil Spill Modelling	Written Response	4.9
3137	NGO	Security		Written Response	6.10, 6.10
3138	NGO		Route	Written Response	3
3139	Government and Regulators	Water (social aspects)		Written Response	6.13
3140	Other Organisation		PD - Project Design Basis	Feedback Form	4.1
3141	Private Individual		Construction - Environment	Feedback Form	8.2
3142	Private Individual	Community Investment Programme		Road Show	6.7, 6.14
3143	Private Individual	Community Investment Programme		Road Show	6.7, 6.14
3144	Other Organisation		water environmental	Written Response	5.8, 2613a
3145	Government and Regulators		Waste / Waste Water	Written Response	5.8
3146	Government and Regulators		Fish / fisheries	Written Response	5.11
3147	Other Organisation		Project Description	Written Response	4
3148	Other Organisation		Waste / Waste water	Written Response	4.8
3149	Other Organisation		Cumulative Impacts - Environment	Written Response	5.11, 7.2
3150	Other Organisation		Project Description	Written Response	4
3151	Other Organisation		PD - Testing & Commissioning	Written Response	4.3
3152	Other Organisation		Emissions / Dust	Written Response	5.3
3153	Other Organisation		Unplanned events	Written Response	5.5
3154	Other Organisation		Project Alternatives	Written Response	3
3155	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.5, 5.6, 5.8
3156	Other Organisation		Seismicity	Written Response	5.5
3157	Other Organisation		Soil	Written Response	5.8
3158	Other Organisation		Geohazards	Written Response	5.5, 5.8
3159	Other Organisation		Erosion	Written Response	4.4
3160	Other Organisation		Geohazards	Written Response	5.5
3161	Other Organisation		Soil	Written Response	5.6
3162	Other Organisation		Flora and Fauna	Written Response	5.11
3163	Other Organisation		Protected Areas	Written Response	5.11, 5.14
3164	Other Organisation		water environmental	Written Response	5.5
3165	Other Organisation		Environmental Management Plans	Written Response	8
3166	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.5, 5.8
3167	Other Organisation		Soil	Written Response	5.6
3168	Other Organisation		Geohazards	Written Response	5.5
3169	Other Organisation		Erosion	Written Response	4.4
3170	Other Organisation		water environmental	Written Response	5.8
3171`	Other Organisation		water environmental	Written Response	5.8
3172	Other Organisation		Oil spill modelling	Written Response	5.5
3173	Other Organisation		Waste / Waste Water	Written Response	4.8
3174	Other Organisation		Flora and Fauna	Written Response	5.11
3175	Other Organisation		Forests	Written Response	5.11
3176	Other Organisation		Flora and Fauna	Written Response	5.11

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
3177	Other Organisation		Flora and Fauna	Written Response	5.5
3178	Other Organisation		water environmental	Written Response	5.14
3179	Other Organisation		Route	Written Response	5.8
3180	Other Organisation		water environmental	Written Response	5.14
3181	Other Organisation		Emissions / Dust	Written Response	5.3, 8.2
3182	Other Organisation		Noise	Written Response	5.3, 5.4
3183	Other Organisation		Oil Spill Modelling	Written Response	5.5
3184	Other Organisation		Cumulative Impacts - Environment	Written Response	5.11
3185	Other Organisation		Oil Spill Modelling	Written Response	5.5, 5.14
3186	Other Organisation		Cumulative Impacts - Environment	Written Response	5.11
3187	Other Organisation		legal compliance (standards) - environment	Written Response	8.2
3188	Other Organisation		Approach & Methodology	Written Response	3
3189	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.5
3190	Other Organisation		legal compliance (standards) - environment	Written Response	8.2
3191	Other Organisation		water environmental	Written Response	5.8
3192	Other Organisation		Noise	Written Response	5.4
3193	Other Organisation		Flora and Fauna	Written Response	5.11
3194	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3195	Other Organisation		Route	Written Response	5.8, 5.14
3196	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3197	Other Organisation		Oil spill modelling	Written Response	5.5
3198	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3199	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.5
3200	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3201	Other Organisation		Cumulative Impacts - Environment	Written Response	5.11, 7.2
3202	Other Organisation		Climate	Written Response	5.2
3203	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3204	Other Organisation		Approach & Methodology	Written Response	5.2
3205	Other Organisation		Oil Spill Modelling	Written Response	5.5, 5.14
3206	Other Organisation		Emissions / Dust	Written Response	5.2, 5.3
3207	Other Organisation		Oil Spill Mitigation	Written Response	4.1
3208	Other Organisation		Route	Written Response	3
3209	Other Organisation		Approach & Methodology	Written Response	3
3210	Other Organisation		Oil Spill Mitigation	Written Response	4.1
3211	Other Organisation		Project Alternatives	Written Response	3
3212	Other Organisation		Project Alternatives	Written Response	3
3213	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3214	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3215	Other Organisation		legal compliance (standards) - environment	Written Response	8.2
3216	Other Organisation		PD - Ops Control & Maintenance	Written Response	4.5
3217	Other Organisation		Route	Written Response	3

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
31	Private Individual	Employment		Road Show	6.6
32	Private Individual	Community Investment Programme		Road Show	6.13
33	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
34	Private Individual	Employment		Road Show	6.6
35	Private Individual	Employment		Road Show	6.6
36	Private Individual	Employment		Road Show	6.6
37	Private Individual	Safety		Road Show	6.10
38	Private Individual	Land Use Restrictions		Road Show	6.7
39	Private Individual	Land Acquisition and Compensation		Road Show	6.7
40	Private Individual	Employment		Road Show	6.6
41	Private Individual	Community Investment Programme		Road Show	6.13
42	Government and Regulators	Land Acquisition and Compensation		Road Show	6.7
43	Private Individual		PD - Project Design Basis	Road Show	4.1
44	Government and Regulators	Community Investment Programme		Road Show	6.13
45	Private Individual	Employment		Road Show	6.6
46	Private Individual	Land Acquisition and Compensation		Road Show	6.7
47	Private Individual	Land Acquisition and Compensation		Road Show	6.7
48	Government and Regulators	Employment		Road Show	6.6
49	Private Individual	Land Acquisition and Compensation		Road Show	6.7
50	Private Individual	Land Acquisition and Compensation		Road Show	6.7
51	Government and Regulators	Previous Construction Experience		Road Show	6.9
52	Private Individual	Community Relations		Road Show	6.7
53	Private Individual	Land Acquisition and Compensation		Road Show	6.7
54	Government and Regulators	Consultation		Road Show	6.9
55	Private Individual	Land Acquisition and Compensation		Road Show	6.7
56	Private Individual		Route	Road Show	3
57	Government and Regulators	Community Investment Programme		Road Show	6.13
58	Private Individual	Other Compensation		Road Show	6.13
59	Private Individual	Access to Energy		Road Show	6.5
60	Private Individual		PD - Project Schedule	Road Show	4.2
61	Private Individual	Employment		Road Show	6.6
62	Private Individual		Air Quality	Road Show	8.2
63	Private Individual	Community Investment Programme		Road Show	6.13
64	Private Individual	Land Acquisition and Compensation		Road Show	6.7
65	Private Individual	Land Acquisition and Compensation		Road Show	6.7
66	Private Individual		Anthrax	Road Show	5.7
67	Private Individual		Anthrax	Road Show	5.7
68	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
69	Private Individual	Community Investment Programme		Road Show	6.13
70	Private Individual	Community Relations		Road Show	6.9
71	Private Individual	Tariffs		Road Show	6.11
72	Private Individual	Employment		Road Show	6.6
73	Private Individual	Employment		Road Show	6.6
74	Private Individual	Employment		Road Show	6.6
75	Private Individual	Land Acquisition and Compensation		Road Show	6.7
76	Private Individual	Community Investment Programme		Road Show	6.13
77	Private Individual	Employment		Road Show	6.6
78	Private Individual	Employment		Road Show	6.6
79	Private Individual	Community Investment Programme		Road Show	6.13
80	Private Individual	Land Acquisition and Compensation		Road Show	6.7
81	Private Individual	Procurement		Road Show	6.6
82	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
83	Private Individual	Community Investment Programme		Road Show	6.13
84	Private Individual	Employment		Road Show	6.6

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85	Private Individual	Procurement		Road Show	6.6
86	Private Individual	Community Investment Programme		Road Show	6.13
87	Private Individual	Community Investment Programme		Road Show	6.13
88	Private Individual	Water (social aspects)	Hydrology water supply systems	Road Show	5.8, 6.8
89	Private Individual	Land Acquisition and Compensation		Road Show	6.7
90	Private Individual	Land Acquisition and Compensation		Road show	6.7
91	Private Individual	Land Acquisition and Compensation		Road show	6.7
92	Private Individual	Land Acquisition and Compensation		Road show	6.7
93	Private Individual	Land Acquisition and Compensation		Road show	6.7
94	Private Individual	Land Acquisition and Compensation		Road show	6.7
95	Private Individual	Infrastructure, Transport, Roads		Road show	6.8
96	Private Individual	Community Investment Programme		Road Show	6.13
97	Private Individual	Safety	PD - Ops Control & Maintenance	Road Show	6.10
98	Private Individual	Employment		Road Show	6.6
99	Private Individual	Access to Energy		Road Show	6.5
100	Private Individual	Land Acquisition and Compensation		Road Show	6.7
101	Private Individual	Community Investment Programme	Archaeology & Cultural Heritage	Road show	5.1, 6.13
102	Private Individual	Land Acquisition and Compensation		Road Show	6.7
103	Private Individual	Employment		Road Show	6.6
104	Private Individual	Consultation		Road Show	6.9
105	Private Individual	Employment		Road Show	6.6
106	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
107	Private Individual	Consultation		Road Show	6.9
108	Private Individual	Previous Construction Experience		Road Show	6.9
109	Private Individual	Community Investment Programme		Road Show	6.13
110	Private Individual	Employment		Road Show	6.6
111	Private Individual	Community Investment Programme		Road Show	6.13
112	Private Individual	Land Acquisition and Compensation		Road show	6.7, 6.14
113	Private Individual	Land Acquisition and Compensation		Road show	6.7
114	Private Individual	Land Acquisition and Compensation		Road show	6.7, 6.10
115	Private Individual	Access to Energy		Road Show	6.5
116	Private Individual	Land Acquisition and Compensation		Road show	6.7
117	Private Individual	Other Compensation		Road Show	6.9
118	Private Individual	Access to Energy		Road show	6.5
119	Private Individual		PD - System Construction	Road show	4.2
120	Private Individual	Land Acquisition and Compensation		Road show	6.7
121	Private Individual	Land Acquisition and Compensation		Road show	6.7
122	Private Individual		Route	Road show	3
123	Private Individual	Employment		Road show	6.6
124	Private Individual	Land Acquisition and Compensation		Road show	6.7
125	Private Individual	Employment		Road show	6.6
126	Private Individual	Land Acquisition and Compensation		Road show	6.7
127	Private Individual	Employment		Road show	6.6
128	Private Individual	Land Acquisition and Compensation		Road show	6.7
129	Private Individual	Land Acquisition and Compensation		Road show	6.7
130	Private Individual	Community Investment Programme		Road show	6.13
131	Private Individual	Community Investment Programme		Road show	6.13
132	Private Individual	Access to Energy		Road show	6.5
133	Private Individual	Community Investment Programme		Road Show	6.13

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134	Private Individual	Employment		Road Show	6.6
135	Private Individual		Forests	Road show	5.11
136	Private Individual	Community Relations		Road Show	6.9
137	Private Individual	Employment		Road show	6.6
138	Private Individual	Access to Energy		Road Show	6.5
139	Private Individual	Employment		Road Show	6.6
140	Private Individual	Employment		Road show	6.6
141	Private Individual	Land Acquisition and Compensation		Road Show	6.7
142	Private Individual		Protected Areas	Road show	5.11, 5.12
143	Private Individual	Land Acquisition and Compensation		Road Show	6.7
144	Private Individual		PD - Testing & Commissioning	Road Show	4.3
145	Private Individual	Community Relations		Road show	6.9
146	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
147	Private Individual		PD - System Construction	Road Show	4.2
148	Private Individual	Land Acquisition and Compensation		Road Show	6.7
149	Private Individual	Community Relations		Road show	6.9
150	Private Individual	Land Acquisition and Compensation		Road Show	6.7
151	Private Individual	Procurement		Road Show	6.6
152	Private Individual	Access to Energy		Road Show	6.5
153	Private Individual	Community Investment Programme		Road Show	6.13
154	Private Individual	International Standards and Legal Compliance (social)		Road show	6.3
155	Private Individual	Tariffs		Road Show	6.11
156	Private Individual	Safety	PD - Ops Control & Maintenance	Road Show	6.10
157	Private Individual	Community Investment Programme		Road Show	6.13
158	Private Individual	Land Acquisition and Compensation		Road Show	6.7
159	Private Individual	Land Acquisition and Compensation		Road Show	6.7
160	Private Individual	Employment		Road Show	6.6
161	Government and Regulators	Community Investment Programme		Road show	6.13
162	Government and Regulators	Community Investment Programme		Road show	6.13
163	NGO	Consultation		Road show	6.9
164	NGO	Consultation		Road show	6.9
165	Private Individual	Community Investment Programme		Road show	6.13
166	Private Individual	ESIA Documentation and Translation		Road show	6.3
167	Private Individual		PD - System Construction	Road Show	4.2
168	Private Individual	Land Acquisition and Compensation		Road Show	6.7
169	Private Individual	Community Investment Programme		Road show	6.13
170	Private Individual	Employment		Road Show	6.6
171	Private Individual	Safety	PD - Ops Control & Maintenance	Road show	6.10
172	Private Individual	Employment		Road Show	6.6
173	Private Individual	Community Investment Programme		Road show	6.13
174	Private Individual	Community Investment Programme		Road Show	6.13
175	Private Individual	Procurement		Road show	6.6
176	Private Individual		PD - Outline of Pipeline & Facilities	Road Show	4.2
177	Private Individual	Water (social aspects)	water environmental	Road Show	5.8, 6.8
178	Private Individual	Community Investment Programme		Road Show	6.13
179	Private Individual		Archaeology & Cultural Heritage	Road Show	5.1
180	Private Individual		Archaeology & Cultural Heritage	Road Show	5.1
181	Private Individual		Archaeology & Cultural Heritage	Road Show	5.1
182	Private Individual	Community Investment Programme		Road Show	6.13
183	Private Individual		Forests	Road show	5.11, 5.12
184	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
185	Private Individual	Access to Energy		Road Show	6.5
186	Private Individual	Community Relations		Road Show	6.9

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187	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
188	Private Individual	Infrastructure, Transport, Roads		Road Show	6.8
189	Private Individual		Construction - Environment	Road show	5.14
190	Private Individual	Procurement		Road Show	6.6
191	Private Individual	Access to Energy		Road Show	6.5
192	Private Individual	Land Acquisition and Compensation		Road show	6.7
193	Private Individual		PD - System Construction	Road Show	4.2
194	Private Individual	Land Acquisition and Compensation		Road show	6.7
195	Private Individual		PD - System Construction	Road Show	4.2
196	Private Individual		PD - Outline of Pipeline & Facilities	Road show	4.2
197	Private Individual		Seismicity	Road Show	5.5
198	Private Individual	Land Acquisition and Compensation		Road show	6.7
199	Private Individual	Community Investment Programme		Road Show	6.13
200	Private Individual	Community Investment Programme		Road show	6.13
201	Private Individual	Access to Energy		Road show	6.5
202	Private Individual	Water (social aspects)		Road show	6.8
203	Private Individual	Tariffs		Road show	6.11
204	Private Individual		PD - Project Design Basis	Road show	4.1
205	Private Individual	Land Use Restrictions		Road show	6.7
206	Private Individual	Procurement		Road show	6.6
207	Private Individual	Land Use Restrictions		Road show	6.7
208	Private Individual	Water (social aspects)		Road show	6.8
209	Private Individual	Community Investment Programme		Road show	6.13
210	Private Individual	Infrastructure, Transport, Roads		Road show	6.8
211	Private Individual	Land Use Restrictions		Road show	6.7
212	Private Individual	Health		Road show	6.10
213	Private Individual	Safety	PD - Ops Control & Maintenance	Road show	6.10
214	Private Individual	Security		Road show	6.10
215	Private Individual	Infrastructure, Transport, Roads		Road show	6.8
216	Private Individual	Employment		Road show	6.6
217	Private Individual	Land Acquisition and Compensation		Road show	6.7
218	Private Individual		PD - Project Schedule	Road show	4.2
219	Private Individual	Employment		Road show	6.6
220	Private Individual	Land Acquisition and Compensation		Road show	6.7
221	Private Individual	Employment		Road show	6.6
222	Private Individual	Other Compensation	Unplanned Events	Road show	5.5, 6.1
223	Private Individual	Community Investment Programme		Road show	6.13
224	Private Individual	Community Investment Programme		Road show	6.13
225	Private Individual	Infrastructure, Transport, Roads		Road show	6.8
226	Private Individual	Community Investment Programme		Road show	6.13
227	Private Individual	Land Use Restrictions		Road show	6.7
228	Private Individual	Community Investment Programme		Road show	6.13
229	Private Individual	Community Investment Programme		Road show	6.13
230	Private Individual	Land Acquisition and Compensation		Road show	6.7
231	Private Individual		PD - System Construction	Road Show	4.2
232	Private Individual	ESIA Documentation and Translation		Road Show	6.3
233	Private Individual	Land Acquisition and Compensation		Road show	6.7
234	Private Individual		PD - Project Design Basis	Road Show	4.1
235	Private Individual	ESIA Documentation and Translation		Road Show	6.3
236	Private Individual	Community Investment Programme		Road show	6.13
237	Private Individual	Employment		Road show	6.6
238	Private Individual	Community Investment Programme		Road show	6.13
239	Private Individual	ESIA Documentation and Translation		Road Show	6.3

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240	Private Individual	Community Investment Programme		Road show	6.13
241	Private Individual	Community Investment Programme		Road show	6.13
242	Private Individual	Community Relations		Road Show	6.9
243	Private Individual	ESIA Documentation and Translation		Road Show	6.3
244	Private Individual	Procurement		Road show	6.6
245	Government and Regulators	Water (social aspects)	Route	Road Show	5.8, 6.8
246	Private Individual	Employment		Road Show	6.6
247	Private Individual	Community Relations		Road Show	6.9
248	Private Individual	Water (social aspects)	water environmental	Road Show	5.8, 5.14, 6.8
249	Private Individual	Security		Road Show	6.10
250	Private Individual	Land Acquisition and Compensation		Road Show	6.7
251	Private Individual	Employment		Road Show	6.6
252	Government and Regulators	Employment		Road Show	6.6
253	Private Individual	Procurement		Road Show	6.6
254	Private Individual	Employment		Road Show	6.6
255	Private Individual		Seismicity	Road Show	5.5
256	Private Individual	Procurement		Road Show	6.6
257	Private Individual	Employment		Road Show	6.6
258	Private Individual	ESIA Documentation and Translation		Road Show	6.3
259	Number not used				
260	Number not used				
261	Number not used				
262	Government and Regulators		Oil Spill Modelling	Written Response	5.5
263	Government and Regulators	Water (social aspects)	Oil Spill Modelling	Written Response	5.5, 5.8, 6.8
264	Government and Regulators		Oil Spill Modelling	Written Response	5.14
265	Government and Regulators		Oil Spill Modelling	Written Response	5.14
266	Government and Regulators		Oil Spill Modelling	Written Response	5.14
267	Government and Regulators		Oil Spill Modelling	Written Response	5.14
268	Government and Regulators		Oil Spill Modelling	Written Response	5.14
269	Government and Regulators	Water (social aspects)	Oil Spill Modelling	Written Response	4.10, 5.8, 6.8
270	Government and Regulators	Water (social aspects)	Oil Spill Modelling	Written Response	5.5, 6.8
271	Government and Regulators	Water (social aspects)	Oil Spill Modelling	Written Response	5.5, 5.8, 6.8
272	Government and Regulators		Oil Spill Modelling	Written Response	4.10, 5.14
273	Government and Regulators		Oil Spill Modelling	Written Response	5.14
274	Government and Regulators		Oil Spill Modelling	Written Response	5.5
275	Government and Regulators		Oil Spill Modelling	Written Response	5.14
276	Government and Regulators		Oil Spill Modelling	Written Response	5.14
277	Government and Regulators		Oil Spill Modelling	Written Response	5.14
278	Government and Regulators		Flora	Written Response	5.11
279	Government and Regulators		Flora	Written Response	5.11
280	Government and Regulators		Flora	Written Response	5.11
281	Government and Regulators		Forestry	Written Response	5.11
282	Government and Regulators		Forestry	Written Response	5.11
283	Government and Regulators		Flora	Written Response	5.11
284	Government and Regulators		Flora	Written Response	5.11
285	Government and Regulators		Flora and Fauna	Written Response	5.11
286	Government and Regulators		Flora and Fauna	Written Response	5.11
287	Government and Regulators		Flora	Written Response	5.11

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288	Government and Regulators		Flora	Written Response	5.11
289	Government and Regulators		Flora	Written Response	5.11
290	Government and Regulators		Flora	Written Response	5.11
291	Government and Regulators	Tourism	Flora and Fauna	Written Response	5.11, 6.6
292	Government and Regulators		Flora	Written Response	5.11
293	Government and Regulators		Flora	Written Response	5.11
294	Government and Regulators		Flora	Written Response	5.11
295	Government and Regulators		Flora	Written Response	5.11
296	Government and Regulators		Flora and Fauna	Written Response	5.11
297	Government and Regulators	Tourism	Landscape / Visual impacts	Written Response	5.9, 6.6
298	Government and Regulators		Flora and Fauna	Written Response	5.11
299	Government and Regulators		Flora and Fauna	Written Response	5.11
300	Government and Regulators		Environmental Monitoring	Written Response	8.2
301	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
302	Government and Regulators		HydroGeology / Geomorphology	Written Response	4.10
303	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
304	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
305	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
306	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
307	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5, 4.10
308	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
309	Government and Regulators	Water (social aspects)	HydroGeology / Geomorphology	Written Response	5.5, 5.8, 6.8
310	Government and Regulators	Water (social aspects)	Oil Spill Modelling	Written Response	5.5, 6.8
311	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
312	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
313	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
314	Government and Regulators		Oil Spill Modelling	Written Response	5.14
315	Government and Regulators	Baseline	Oil Spill Modelling	Written Response	5.5, 5.8, 6.4
316	Government and Regulators		Oil Spill Modelling	Written Response	5.14
317	Government and Regulators		Air Quality	Written Response	5.3
318	Government and Regulators		Waste / Waste Water	Written Response	5.6
319	Government and Regulators	Infrastructure, Transport, Roads	Noise	Written Response	5.4, 6.8
320	Government and Regulators		Noise	Written Response	5.4
321	Government and Regulators		Air quality	Written Response	5.3
322	Government and Regulators		Noise	Written Response	5.4
323	Government and Regulators		AGIs - Environment	Written Response	4.5
324	Government and Regulators		Oil Spill Modelling	Written Response	4.1
325	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5, 5.8
326	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
327	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8, 5.14

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328	Government and Regulators		Oil Spill Modelling	Written Response	5.14
329	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
330	Government and Regulators		Oil Spill Modelling	Written Response	4.1
331	Government and Regulators		Oil Spill Modelling	Written Response	5.14
332	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
333	Government and Regulators		Oil Spill Modelling	Written Response	5.14
334	Government and Regulators		Oil Spill Modelling	Written Response	5.14, 5.8
335	Government and Regulators		Oil Spill Modelling	Written Response	5.8, 5.14
336	Government and Regulators		Oil Spill Modelling	Written Response	5.14
337	Government and Regulators		Oil Spill Modelling	Written Response	5.14
338	Government and Regulators		Oil Spill Modelling	Written Response	5.14
339	Government and Regulators	Tourism	Forests	Other Meeting	5.11, 6.6
340	Government and Regulators		Route	Other Meeting	3
341	Government and Regulators		Forests	Other Meeting	5.11
342	Government and Regulators		Flora and Fauna	Other Meeting	5.11
343	Government and Regulators		HydroGeology / Geomorphology	Other Meeting	5.5
344	Government and Regulators		HydroGeology / Geomorphology	Other Meeting	4.10
345	Government and Regulators		HydroGeology / Geomorphology	Other Meeting	5.5
346	Government and Regulators		Forests	Other Meeting	5.11
347	Government and Regulators	Tourism	Protected Areas	Other Meeting	5.12, 5.11, 5.8, 6.6
348	Government and Regulators		Route	Other Meeting	3
349	Government and Regulators		Flora and Fauna	Other Meeting	5.11
350	Government and Regulators		Forests	Other Meeting	5.11
351	Government and Regulators		Forests	Other Meeting	5.11
352	Government and Regulators	Tourism	Landscape / Visual impacts	Other Meeting	5.9, 6.6
353	Government and Regulators		Protected Areas	Other Meeting	5.12, 4.10
354	Government and Regulators		Protected Areas	Other Meeting	5.12, 5.11
355	Government and Regulators		Forests	Other Meeting	5.11
356	Government and Regulators		Protected Areas	Other Meeting	5.12
357	Government and Regulators		Protected Areas	Other Meeting	5.12, 8.2
358	Government and Regulators		Protected Areas	Other Meeting	5.12
359	Government and Regulators		Protected Areas	Other Meeting	5.12, 5.5
360	Government and Regulators		Protected Areas	Other Meeting	5.12
361	Private Company		HydroGeology / Geomorphology	Other Meeting	5.14
362	Private Company		HydroGeology / Geomorphology	Other Meeting	5.14
363	Private Company	Issues around Borjomi		Other Meeting	5.14
364	Private Company		HydroGeology / Geomorphology	Other Meeting	5.14
365	Independent Report	Issues around Borjomi		Written Response	5.14
366	Government and Regulators		Forests	Written Response	5.11
367	Government and Regulators		Forests	Other Meeting	5.11, 4.10
368	Government and Regulators		Forests	Other Meeting	5.11

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369	Government and Regulators		Forests	Other Meeting	5.11
370	Government and Regulators	Tourism	Forests	Other Meeting	5.11, 6.6
371	Government and Regulators		Forests	Other Meeting	5.11, 8.2
372	Government and Regulators	Tourism	Forests	Other Meeting	5.11, 6.6
373	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5, 5.8
374	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5, 5.8, 5.14
375	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
376	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
377	Private Individual	Employment		Public Meeting	6.6
378	Private Individual	Health		Public Meeting	6.10
379	Private Individual		Air Quality	Public Meeting	5.3
380	Private Individual		Waste / Waste Water	Public Meeting	4.8
381	Private Individual	Health		Public Meeting	6.10
382	Private Individual		Project Description	Public Meeting	4
383	Private Individual	Health		Public Meeting	6.10
384	Private Individual		Project Description	Public Meeting	4
385	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
386	Private Individual	Safety	Project Description	Public Meeting	6.10,4
387	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
388	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
389	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
390	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
391	Private Individual		Archaeology & Cultural Heritage	Public Meeting	5.1
392	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
393	Private Individual	Security		Public Meeting	6.10
394	Private Individual	Community Investment Programme		Public Meeting	6.13
395	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
396	Government and Regulators	Consultation	Legal Compliance (standards) - environment	Written Response	5.11, 6.9
397	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
398	Government and Regulators	Community Relations		Written Response	6.9
399	Private Individual	Community Investment Programme		Public Meeting	6.13
400	Government and Regulators	Consultation	Legal Compliance (standards) - environment	Written Response	4.1, 6.9
401	Private Individual	Land Acquisition and Compensation		Public Meeting	6.12, 6.7
402	Private Individual	Land Acquisition and Compensation	PD - Project Design Basis	Public Meeting	6.7
403	Private Individual	Employment		Public Meeting	6.6
404	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
405	Private Individual	Land Use Restrictions		Public Meeting	6.7
406	Private Individual		Project Description	Public Meeting	4
407	Private Individual		Project Description	Public Meeting	4
408	Private Individual	Safety	Oil Spill Mitigation	Public Meeting	5.14, 6.1
409	Private Individual		Environmental Investment Programme	Public Meeting	8.2
410	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
411	Private Individual		HydroGeology / Geomorphology	Public Meeting	5.14, 5.8
412	Private Individual	Community Relations		Public Meeting	6.9
413	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
414	NGO	Community Investment Programme		Public Meeting	6.13
415	Private Individual	Employment		Public Meeting	6.6
416	NGO	Employment		Public Meeting	6.6
417	NGO	Land Acquisition and Compensation		Public Meeting	6.7

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418	NGO	Community Investment Programme		Public Meeting	6.13
419	NGO	Land Acquisition and Compensation		Public Meeting	6.7
420	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
421	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
422	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
423	NGO	Safety		Public Meeting	6.10
424	NGO		Emissions / Dust	Public Meeting	8.2
425	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
426	Private Individual	Community Relations		Public Meeting	6.9
427	NGO	Health		Public Meeting	6.10
428	NGO	ESIA Documentation and Translation		Public Meeting	6.4
429	NGO	Health		Public Meeting	6.10
430	NGO	Infrastructure, Transport, Roads		Public Meeting	6.8
431	NGO		Waste / Waste Water	Public Meeting	4.8
432	Private Individual	Consultation		Public Meeting	6.9
433	NGO	Health		Public Meeting	6.10
434	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
435	NGO	Health		Public Meeting	6.10
436	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
437	NGO	Land Acquisition and Compensation		Public Meeting	6.7
438	NGO	Safety		Public Meeting	6.10
439	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
440	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
441	NGO	Health		Public Meeting	6.10
442	Private Individual	Employment		Public Meeting	6.6
443	Private Individual	Employment		Public Meeting	6.6
444	NGO		Anthrax and Disease	Public Meeting	5.7
445	Private Individual		Project Description	Public Meeting	4
446	Private Individual	Consultation		Public Meeting	6.9
447	NGO	Health		Public Meeting	6.10
448	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
449	Private Individual	Consultation		Public Meeting	6.9
450	Private Individual		Project Description	Public Meeting	4
451	Private Individual	Safety	Project Description	Public Meeting	6.10,4
452	Private Individual	Consultation		Public Meeting	6.9
453	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
454	Private Individual		Archaeology & Cultural Heritage	Public Meeting	5.1
455	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
456	Private Individual	Consultation		Public Meeting	6.9
457	Private Individual	Consultation		Public Meeting	6.9
458	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
459	Private Individual	Consultation		Public Meeting	6.9
460	Private Individual	Employment		Public Meeting	6.6
461	Private Individual	Safety	Project Alternatives	Public Meeting	3.0
462	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
463	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.8, 5.14
464	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
465	Government and Regulators		Oil Spill Modelling	Written Response	5.14
466	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
467	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
468	Private Individual	Employment		Public Meeting	6.6
469	Private Individual	Health		Public Meeting	6.10
470	Government and Regulators		Oil Spill Modelling	Written Response	5.14
471	Private Individual	Security		Public Meeting	6.10
472	Government and Regulators		Oil Spill Modelling	Written Response	5.14

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
473	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
474	Private Individual	Cumulative and Residual Impacts		Public Meeting	6.12
475	Government and Regulators		Geohazards	Written Response	5.8
476	Government and Regulators		Geohazards	Written Response	5.5
477	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
478	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
479	Private Individual	Community Investment Programme		Public Meeting	6.13
480	Private Individual		Environmental Management Plans	Public Meeting	5.8
481	Private Individual	Employment		Public Meeting	6.6
482	Government and Regulators		Geohazards	Written Response	5.5
483	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
484	Private Individual	Employment		Public Meeting	6.6
485	Private Individual		Project Description	Public Meeting	4
486	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
487	Private Individual	Employment		Public Meeting	6.6
488	Private Individual	Employment		Public Meeting	6.6
489	Number not used				
490	Private Individual	Employment		Public Meeting	6.6
491	Private Individual			Public Meeting	6.7
492	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
493	Private Individual		Environmental Monitoring	Public Meeting	8.2
494	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
495	Private Individual		Route	Public Meeting	3
496	Number not used				
497	Private Individual	Monitoring - Social		Public Meeting	8.3
498	Private Individual		Erosion	Public Meeting	3
499	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
500	Private Individual		Construction - Environment	Public Meeting	5.3, 5.6, 5.11
501	Private Individual		Flora and Fauna	Public Meeting	5.11
502	Private Individual	Security		Public Meeting	6.10
503	Private Individual		Project Description	Public Meeting	4
504	Private Individual	Community Investment Programme		Public Meeting	6.13
505	Private Individual	Tariffs		Public Meeting	6.11
506	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
507	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
509	Private Individual		Project Description	Public Meeting	4
510	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
511	Number not used				
512	Government and Regulators		Geohazards	Written Response	5.5
513	Government and Regulators		Landscape / Visual impacts	Written Response	5.9
514	Government and Regulators		Geohazards	Written Response	5.5
515	Government and Regulators		Oil Spill Modelling	Written Response	5.14
516	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
517	Government and Regulators		Oil Spill Modelling	Written Response	5.14
518	Private Individual	Reinstatement	Forests	Public Meeting	5.11
519	Government and Regulators		Route	Written Response	3
520	Government and Regulators		Project Description	Written Response	4
521	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
522	Government and Regulators		Flora and Fauna	Written Response	5.11
523	Private Individual	Safety	Project Description	Public Meeting	6.10,4
524	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
525	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
526	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
527	Private Individual	Employment		Public Meeting	6.6
528	Private Individual	Community Investment Programme		Public Meeting	6.9, 6.14
529	Private Individual		Project Description	Public Meeting	4
530	Private Individual		Project Description	Public Meeting	4
531	Private Individual		Seismicity	Public Meeting	5.5
532	Private Individual		water environmental	Public Meeting	5.14
533	Private Individual		Oil Spill Mitigation	Public Meeting	5.14
534	Private Individual	Tourism		Public Meeting	6.6
535	Private Individual		Environmental Management Plans	Public Meeting	8.2
536	Private Individual	Health		Public Meeting	6.10
537	NGO		Legal Compliance (standards) - environment	NGO Workshop	4
538	Private Individual		Archaeology & Cultural Heritage	Feedback Form	5.1
539	NGO		Project Description	NGO Workshop	4
540	NGO		Project Description	NGO Workshop	4
541	NGO		Project Description	NGO Workshop	4
542	Private Individual	Community Relations		Feedback Form	6.9
543	NGO		Flora and Fauna	NGO Workshop	5.11
544	NGO		HydroGeology / Geomorphology	NGO Workshop	5.5
545	Private Individual	Employment		Public Meeting	6.6
546	Private Individual	Safety	Project Description	Feedback Form	4, 6.10, 8.2
547	NGO		Archaeology & Cultural Heritage	NGO Workshop	5.1
548	Private Individual	Safety	Cumulative Impacts - Environment	Feedback Form	5.11, 7.2, 6.10
549	NGO		Archaeology & Cultural Heritage	NGO Workshop	5.1
550	NGO		Soil	NGO Workshop	5.6
551	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
552	NGO	Water (social aspects)		NGO Workshop	6.8
553	Private Individual	Macroeconomics		Feedback Form	6.3
554	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
555	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
556	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
557	Private Individual	Procurement		Feedback Form	6.6
558	Private Individual	Water (social aspects)		Public Meeting	6.8
559	Private Individual		Flora and Fauna	Public Meeting	5.11
560	Private Individual	Reinstatement	Forests	Public Meeting	5.11, 6.9
561	Private Individual	Employment		Feedback Form	6.6
562	Private Individual		Environmental Management Plans	Public Meeting	8.2
563	Private Individual	Employment		Public Meeting	6.6
564	Private Individual	Employment		Feedback Form	6.6
565	Private Individual	Reinstatement	Forests	Public Meeting	6.9
566	NGO		Flora and Fauna	NGO Workshop	5.11
567	Private Individual	Tariffs		Public Meeting	6.11
568	Private Individual	Employment		Feedback Form	6.6
569	Private Individual		Archaeology & Cultural Heritage	Public Meeting	5.1
570	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
571	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
572	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
573	Private Individual	Community Investment Programme		Public Meeting	6.13
574	Private Individual	Community Investment Programme		Public Meeting	6.13
575	Private Individual		Archaeology & Cultural Heritage	Public Meeting	5.1
576	Private Individual	Community Relations		Public Meeting	6.9
577	Private Individual		Route	Feedback Form	3
578	Private Individual		Seismicity	Public Meeting	6.4
579	Private Individual	Safety	Project Description	Public Meeting	4, 6.10, 8.2
580	Private Individual	Community Investment Programme		Public Meeting	6.13
581	Private Individual		Project Description	Feedback Form	4
582	Private Individual		Route	Public Meeting	5.8

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
583	Private Individual	Employment		Public Meeting	6.6
584	Private Individual	Employment		Public Meeting	6.6
585	NGO		Archaeology & Cultural Heritage	NGO Workshop	5.1
586	NGO		Flora and Fauna	NGO Workshop	5.11
587	NGO		Waste / Waste Water	NGO Workshop	4.8
588	Private Individual		Forests	Public Meeting	5.11
589	Private Individual		Environmental Management Plans	Public Meeting	8
590	Private Individual		Archaeology & Cultural Heritage	Public Meeting	5.1
591	Private Individual	Community Investment Programme		Public Meeting	6.13
592	Private Individual	Access to Energy		Public Meeting	6.5
593	Government and Regulators	Reinstatement	Forests	NGO Workshop	5.11, 6.7
594	Private Individual	Infrastructure, Transport, Roads		Public Meeting	6.8
595	NGO		Archaeology & Cultural Heritage	NGO Workshop	5.1
596	Private Individual	Support for Project		Feedback Form	6.2
597	Private Individual	Employment		Public Meeting	6.6
598	Private Individual	Employment		Feedback Form	6.6
599	Private Individual	Community Investment Programme		Public Meeting	6.13
600	Private Individual	Employment		Public Meeting	6.6
601	Private Individual	Support for Project		Feedback Form	6.2
602	Private Individual		PD - Project Schedule	Public Meeting	4.2
603	Private Individual		Project Description	Public Meeting	4
604	Private Individual	Support for Project		Feedback Form	6.2
605	Private Individual	Security		Public Meeting	6.10
606	Private Individual	Community Relations		Public Meeting	6.9
607	Private Individual	Support for Project		Feedback Form	6.2
608	Private Individual	Safety		Public Meeting	6.10
609	Private Individual	Employment		Feedback Form	6.6
610	Private Individual	Employment		Public Meeting	6.6
611	Private Individual	Support for Project		Feedback Form	6.2
612	Private Individual	Support for Project		Feedback Form	6.2
613	Private Individual		Route	Public Meeting	5.8, 5.14
614	NGO		Landscape / Visual impacts	NGO Workshop	8.2
615	Private Individual	Support for Project		Feedback Form	6.2
616	Private Individual	Community Investment Programme		Public Meeting	6.13
617	NGO		Support for Project	NGO Workshop	4
618	NGO	Land Acquisition and Compensation		NGO Workshop	6.7
619	NGO		Anthrax and Disease	NGO Workshop	5.7
620	Private Individual	Tourism		Public Meeting	6.10, 6.6
621	Private Individual	Support for Project		Feedback Form	6.2
622	NGO		Flora and Fauna	NGO Workshop	5.11
623	Private Individual	Livelihoods		Feedback Form	6.13
624	Private Individual	Water (social aspects)		Public Meeting	6.8
625	Private Individual	Support for Project		Feedback Form	6.2
626	Private Individual	Employment		Public Meeting	6.6
627	Private Individual	Support for Project		Feedback Form	6.2
628	Private Individual	Support for Project		Feedback Form	6.2
629	Private Individual		Archaeology & Cultural Heritage	Public Meeting	5.1
630	Private Individual	Support for Project		Feedback Form	6.2
631	Private Individual	Livelihoods		Feedback Form	6.2
632	Private Individual	Consultation		Public Meeting	6.9
633	Private Individual	Employment		Feedback Form	6.6
634	NGO	Tourism		NGO Workshop	6.6
635	Private Individual	Employment		Feedback Form	6.6
636	Private Individual	Community Investment Programme		Public Meeting	6.13
637	Private Individual	Livelihoods		Feedback Form	6.2
638	Private Individual	Employment		Feedback Form	6.6
639	NGO	Procurement		Public Meeting	6.6
640	Private Individual	Employment		Feedback Form	6.6
641	Private Individual	Support for Project		Feedback Form	6.2
642	Private Individual	Support for Project		Feedback Form	6.2
643	Private Individual	Support for Project		Feedback Form	6.2
644	Private Individual	Employment		Feedback Form	6.6
645	Private Individual	Support for Project		Feedback Form	6.2
646	Private Individual	Employment		Feedback Form	6.6
647	Private Individual	Employment		Public Meeting	6.6
648	NGO		Archaeology & Cultural Heritage	Public Meeting	5.1
649	Private Individual	Employment		Feedback Form	6.6

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
650	Private Individual	ESIA Documentation and Translation		Public Meeting	5.1, 6.6
651	Private Individual	Access to Energy		Feedback Form	6.5
652	Private Individual	Community Investment Programme		Feedback Form	6.13
653	Private Individual	Support for Project		Feedback Form	6.2
654	Private Individual	Employment		Public Meeting	6.6
655	Private Individual		Archaeology & Cultural Heritage	Feedback Form	5.1
656	Private Individual	Tariffs		Public Meeting	6.11
657	Private Individual	Employment		Public Meeting	6.6
658	Private Individual		Construction - Environment	Feedback Form	5.11
659	Private Individual	Employment		Feedback Form	6.6
660	Private Individual		Route	Public Meeting	5.8
661	Private Individual		Climate	Written Response	5.3, 5.2
662	Private Individual	Tourism		Public Meeting	6.6
663	Private Individual	Support for Project		Feedback Form	6.2
664	Private Individual	Land Use Restrictions		Written Response	6.7
665	Private Individual	ESIA Documentation and Translation		Written Response	6.3
666	Private Individual	Employment		Feedback Form	6.6
667	Private Individual	Employment		Written Response	6.6
668	Private Individual		Project Description	Written Response	4
669	Private Individual	Access to Energy		Feedback Form	6.5
670	Private Individual	Land Acquisition and Compensation		Telephone	6.7
671	Private Individual	Land Acquisition and Compensation		Telephone	6.7
672	Private Individual	Safety	Project Description	Feedback Form	6.10,4
673	Private Individual	Consultation		Telephone	6.9
674	Private Individual	Land Acquisition and Compensation		Telephone	6.7
675	Private Individual	Employment		Feedback Form	6.6
676	Private Individual	Land Acquisition and Compensation		Telephone	6.7
677	Private Individual		Project Description	Telephone	4
678	Private Individual	Employment		Telephone	6.6
679	Private Individual	Employment		Telephone	6.6
680	Private Individual		Environmental Management Plans	Feedback Form	8.2
681	Private Individual	Consultation		Telephone	6.9
682	Private Individual		Seismicity	Feedback Form	5.5
683	Private Individual	Employment		Telephone	6.6
684	Private Individual	Procurement		Telephone	6.6
685	Private Individual		AGIs - Environment	Feedback Form	5.4
686	Private Individual	Employment		Telephone	6.6
687	NGO	Community Investment Programme		Feedback Form	6.13
688	Private Individual		Legal Compliance (standards) - environment	Feedback Form	3
689	Private Individual	Livelihoods		Feedback Form	6.2
690	Private Individual	Land Acquisition and Compensation		Telephone	6.7
691	Private Individual		Flora	Feedback Form	5.11
692	Government and Regulators		Fish / fisheries	Feedback Form	5.11
693	Private Individual	Land Acquisition and Compensation		Telephone	6.7
694	Private Individual	Employment		Feedback Form	6.6
695	Private Individual	Land Acquisition and Compensation		Telephone	6.7
696	Private Individual	Support for Project		Feedback Form	6.2
697	Private Individual	Consultation		Telephone	6.9
698	Private Individual	Tariffs		Feedback Form	6.11
699	Private Individual	Security		Feedback Form	6.10
700	Private Individual		PD - Ops Control & Maintenance	Feedback Form	4.5
701	Private Individual	Employment		Feedback Form	6.6
702	Number not used				
703	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
704	NGO		Project Description	Written Response	4
705	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
706	NGO		Project Description	Written Response	4
707	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
708	Private Individual		AGIs - Environment	Written Response	5.3, 5.9
709	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
710	Private Individual		Project Alternatives	Written Response	3
711	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
712	Private Individual		Project Alternatives	Written Response	3
713	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
714	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
715	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
716	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
717	Government and Regulators		HydroGeology / Geomorphology	Written Response	4.10
718	Government and Regulators		HydroGeology / Geomorphology	Written Response	4.10
719	Government and Regulators		HydroGeology / Geomorphology	Written Response	4.10
720	NGO	Procurement		Written Response	6.6
721	NGO	Land Acquisition and Compensation		Written Response	6.7
722	NGO	Procurement		Written Response	6.6
723	NGO	Consultation		NGO workshop	6.9
724	Government and Regulators	Consultation		NGO workshop	6.9
725	NGO	Consultation		NGO workshop	6.9
726	Private Individual	Consultation		NGO workshop	6.9
727	NGO	Consultation		NGO workshop	6.9
728	Private Individual	Consultation		NGO workshop	6.9
729	Private Individual	Consultation		NGO workshop	6.9
730	NGO	Consultation		NGO workshop	6.9
731	NGO	Community Relations		NGO workshop	6.9
732	NGO	Consultation		NGO workshop	6.6
733	NGO	Community Investment Programme		NGO workshop	6.13
734	Government and Regulators	Community Investment Programme		NGO workshop	6.13
735	Government and Regulators	Community Investment Programme		NGO workshop	6.13
736	Government and Regulators		Archaeology & Cultural Heritage	NGO workshop	5.1
737	NGO	Employment		NGO workshop	6.6
738	Government and Regulators	Employment		NGO workshop	6.6
739	Government and Regulators	Employment		NGO workshop	6.6
740	NGO	Community Investment Programme		NGO workshop	6.13
741	Other Organisation	Employment		NGO workshop	6.6
742	Other Organisation	Employment		NGO workshop	6.6
743	Government and Regulators	Community Investment Programme		NGO workshop	6.13
744	Other Organisation	Employment		NGO workshop	6.6
745	NGO	Community Investment Programme		NGO workshop	6.13
746	NGO	Baseline		NGO workshop	6.4
747	NGO	Consultation		NGO workshop	6.9
748	NGO	Health		NGO workshop	6.10
749	NGO	Employment		NGO workshop	6.6
750	NGO	Baseline		NGO workshop	6.4
751	Government and Regulators	Health		NGO workshop	6.10
752	Government and Regulators		Waste / Waste Water	NGO workshop	5.8
753	NGO	Employment		NGO workshop	6.6
754	NGO	Health		NGO workshop	6.10
755	NGO	Employment		NGO workshop	6.6
756	NGO		Environmental Management Plans	NGO workshop	8.2
757	Government and Regulators	Health		NGO workshop	6.10
758	NGO	Consultation		NGO workshop	6.9
759	Government and Regulators		Environmental Management Plans	NGO workshop	8.2
760	NGO	Land Acquisition and Compensation		NGO workshop	6.7
761	Government and Regulators	Other Compensation	Oil Spill Modelling	NGO workshop	4.1, 5.8, 5.14, 6.10
762	NGO	Land Acquisition and Compensation		NGO workshop	6.7

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
763	Government and Regulators	Water (social aspects)		NGO workshop	6.8
764	NGO	Employment		NGO workshop	6.6
765	NGO	Community Relations		NGO workshop	6.9
766	Government and Regulators	Support for Project		NGO workshop	6.2
767	NGO	Data Collection		NGO workshop	6.3
768	NGO	Community Relations		NGO workshop	6.9
769	NGO	Employment		NGO workshop	6.6
770	Independent Report		Support for Project	Written Response	6.2
771	Independent Report		Route	Written Response	3
772	Independent Report		Route	Written Response	3
773	Independent Report		Route	Written Response	3
774	Independent Report		Environmental Management Plans	Written Response	8
775	Independent Report		Route	Written Response	3
776	Independent Report		HydroGeology / Geomorphology	Written Response	5.14
777	Independent Report		Erosion	Written Response	4.4
778	Independent Report		Flora and Fauna	Written Response	5.11
779	Independent Report		water environmental	Written Response	5.5
780	Independent Report		Flora and Fauna	Written Response	5.11
781	Independent Report		Flora and Fauna	Written Response	5.11
782	Independent Report		Route	Written Response	3
783	Independent Report		Archaeology & Cultural Heritage	Written Response	5.1
784	Independent Report		Route	Written Response	3
785	Independent Report	Borjomi	Route	Written Response	3
786	Independent Report		Route	Written Response	3
787	Independent Report		Flora and Fauna	Written Response	5.11
788	Independent Report		Project Description	Written Response	4
789	Independent Report		Project Description	Written Response	4
790	Independent Report		Project Description	Written Response	4
791	Independent Report		Project Description	Written Response	4
792	Independent Report		AGIs - Environment	Written Response	4.5
793	Independent Report		Environmental Management Plans	Written Response	8
794	Independent Report		Construction - Environment	Written Response	4.2
795	Independent Report		Construction - Environment	Written Response	4.2
796	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5, 5.8, 5.14
797	Government and Regulators		Oil Spill Modelling	Written Response	5.14
798	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.9
799	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
800	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
801	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
802	Government and Regulators		HydroGeology / Geomorphology	Written Response	4.10
803	Government and Regulators		Climate	Written Response	5.2
804	Government and Regulators		Forests	Written Response	5.11
805	Government and Regulators		Forests	Written Response	5.11
806	Government and Regulators		HydroGeology / Geomorphology	Written Response	4.10, 5.11
807	NGO		Legal Compliance (standards) - environment	Written Response	4.10
808	Private Individual	Employment		Feedback Form	6.6
809	NGO	Consultation	Environmental Monitoring	Written Response	8.2, 8.3
810	Number not used				
811	Government and Regulators		AGIs - Environment	Written Response	4.5
812	Other Organisation		Anthrax and Disease	Written Response	5.7
813	Other Organisation		Anthrax and Disease	Written Response	5.7
814	Other Organisation		Anthrax and Disease	Written Response	5.7
815	Other Organisation		Anthrax and Disease	Written Response	5.7
816	Private Individual	Community Investment Programme		Written Response	6.13
817	Private Individual	Community Investment Programme		Written Response	6.13
818	Private Individual	Land Acquisition and Compensation		Telephone	6.7
819	Number not used				

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
820	NGO		Oil Spill Modelling	Written Response	4.9
821	NGO		Oil Spill Modelling	Written Response	4.9
822	NGO		Unplanned Events	Written Response	4.9
823	NGO		Oil Spill Modelling	Written Response	4.9
824	NGO		Oil Spill Modelling	Written Response	4.9
825	NGO		Oil Spill Modelling	Written Response	4.9
826	NGO		Oil Spill Modelling	Written Response	4.9
827	NGO		Oil Spill Modelling	Written Response	4.9
828	NGO		Oil Spill Modelling	Written Response	4.9
829	NGO		Oil Spill Modelling	Written Response	5.14
830	NGO		Geohazards	Written Response	5.5
831	NGO		Geohazards	Written Response	5.5
832	NGO		Construction - Environment	Written Response	4.5
833	NGO		Construction - Environment	Written Response	4.5
834	NGO		Soil	Written Response	5.6
835	NGO		Geohazards	Written Response	5.5
836	NGO		Unplanned Events	Written Response	4.8
837	NGO		Surface Water (rivers and lakes)	Written Response	5.5, 5.14
838	NGO		Surface Water (rivers and lakes)	Written Response	5.5, 5.14
839	NGO		Approach & Methodology	Written Response	4.1
840	NGO		HydroGeology / Geomorphology	Written Response	5.8
841	NGO		Soil	Written Response	5.6
842	NGO		Oil Spill Mitigation	Written Response	5.14
843	NGO		Erosion	Written Response	4.4
844	NGO		Geohazards	Written Response	5.5
845	NGO		Geohazards	Written Response	5.5
846	NGO		Geohazards	Written Response	5.5
847	NGO		Geohazards	Written Response	5.5
848	NGO		Geohazards	Written Response	5.5
849	NGO		Oil Spill Mitigation	Written Response	5.14
850	NGO	Community Relations		Written Response	6.9
851	NGO	Community Relations		Written Response	8.3
852	Number not used				
853	NGO		Protected Areas	Written Response	5.12
854	NGO		Flora and Fauna	Written Response	5.11
855	NGO		Protected Areas	Written Response	5.12, 5.14
856	NGO		Forests	Written Response	5.11
857	NGO		Flora	Written Response	5.11
858	NGO		Cumulative Impacts - Environment	Written Response	5.11, 7.2
859	Number not used				
860	NGO		Forests	Written Response	5.11
861	Number not used				
862	Number not used				
863	NGO		PD - Project Design Basis	Written Response	4.1
864	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
865	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
866	NGO		PD - Reinstate & Erosion	Written Response	4.4
867	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
868	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
869	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
870	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
871	NGO		PD - Project Design Basis	Written Response	4.1
872	Government and Regulators		Climate	Written Response	5.2
873	NGO		PD - Wastes & Emissions	Written Response	4.5
874	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
875	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
876	NGO		PD - System Construction	Written Response	4.2
877	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
878	NGO		PD - System Construction	Written Response	4.2
879	NGO		PD - Wastes	Written Response	4.8
880	Government and Regulators		Oil Spill Modelling	Written Response	4.9
881	NGO		PD - System Construction	Written Response	4.2
882	NGO		PD - System Construction	Written Response	4.2

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883	Government and Regulators		Oil Spill Modelling	Written Response	5.5
884	NGO		PD - System Construction	Written Response	4.2
885	NGO		PD - System Construction	Written Response	4.2
886	Government and Regulators		Oil Spill Modelling	Written Response	5.14
887	NGO		PD - Wastes	Written Response	4.8
888	Government and Regulators		Oil Spill Modelling	Written Response	4.9
889	NGO		PD - Project Schedule	Written Response	4.2
890	Government and Regulators		Oil Spill Modelling	Written Response	5.14
891	NGO		Construction - Environment	Written Response	4.5
892	Government and Regulators		Oil Spill Mitigation	Written Response	4.1, 5.14
893	NGO		PD - Testing & Commissioning	Written Response	4.3
894	NGO		PD - System Construction	Written Response	4.2
895	NGO		PD - System Construction	Written Response	4.2
896	NGO		PD - System Construction	Written Response	4.2
897	NGO		PD - Ops Control & Maintenance	Written Response	4.5
898	NGO		PD - Reinstate & Erosion	Written Response	4.4
899	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
900	NGO		PD - System Construction	Written Response	4.2
901	NGO		PD - System Construction	Written Response	4.2
902	NGO		PD - Wastes & Emissions	Written Response	4.5
903	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
904	NGO		PD - Reinstate & Erosion	Written Response	4.4
905	Government and Regulators		Air Quality	Written Response	5.3
906	Other Organisation	Macroeconomics		Written Response	6.3
907	Government and Regulators	ESIA Documentation and Translation		Written Response	6.3
908	Other Organisation	Data Collection		Written Response	6.3
909	Government and Regulators	Employment		Written Response	6.6
910	Other Organisation	Data Collection		Written Response	6.4
911	Other Organisation	Baseline		Written Response	6.4
912	Other Organisation	Demography and Ethnicity		Written Response	6.9
913	Government and Regulators	Community Investment Programme		Written Response	6.13
914	Government and Regulators	Employment		Written Response	6.6
915	Other Organisation	Baseline		Written Response	6.4
916	Government and Regulators	Employment		Written Response	6.6
917	Other Organisation	Land Acquisition and Compensation		Written Response	6.7, 6.6
918	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
919	Other Organisation	Employment		Written Response	6.6
920	Government and Regulators	Consultation		Written Response	6.9
921	Other Organisation	Employment		Written Response	6.6
922	Government and Regulators	Consultation		Written Response	6.9
923	Other Organisation	Employment		Written Response	6.9
924	Government and Regulators	Health		Written Response	6.10
925	Other Organisation	Infrastructure, Transport, Roads		Written Response	6.8
926	Government and Regulators	Community Investment Programme		Written Response	6.13
927	Government and Regulators	Employment		Written Response	6.6
928	Other Organisation	General Construction Queries		Written Response	6.9
929	Government and Regulators	Employment		Written Response	6.6
930	Other Organisation	Data Collection		Written Response	6.3
931	Government and Regulators	Employment		Written Response	6.6
932	Other Organisation	Monitoring - Social		Written Response	8.3
933	Government and Regulators	Employment		Written Response	6.9
934	Other Organisation	Employment		Written Response	6.6

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935	Government and Regulators	Employment		Written Response	6.6
936	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
937	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
938	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
939	Independent Report	Employment		Written Response	6.6
940	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
941	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
942	Other Organisation	Access to Energy		Written Response	6.8
943	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
944	Other Organisation	Health		Written Response	6.10
945	Other Organisation	Community Investment Programme		Written Response	6.13
946	Other Organisation	Baseline		Written Response	6.4, 6.3
947	Independent Report	Community Investment Programme		Written Response	6.7
948	Other Organisation	Data Collection		Written Response	6.3
949	Independent Report	Tourism		Written Response	6.6
950	Other Organisation	Data Collection		Written Response	6.3
951	Other Organisation	Consultation		Written Response	6.9
952	Independent Report	Water (social aspects)		Written Response	6.8
953	Other Organisation	Demography and Ethnicity		Written Response	6.9
954	Other Organisation	Infrastructure, Transport, Roads		Written Response	6.8
955	Independent Report	Community Relations		Written Response	6.10
956	Other Organisation	Consultation		Written Response	6.9
957	Other Organisation	Data Collection		Written Response	6.3
958	Other Organisation		Forests	Written Response	5.11
959	Independent Report	Employment		Written Response	6.6
960	Other Organisation	Livelihoods		Written Response	6.4
961	Independent Report	Procurement		Written Response	6.6
962	Other Organisation	Community Investment Programme		Written Response	6.13
963	Independent Report	Community Investment Programme		Written Response	6.13
964	Other Organisation		Waste / Waste Water	Written Response	4.8
965	Independent Report	Community Investment Programme		Written Response	6.13
966	Other Organisation	International Standards and Legal Compliance (social)		Written Response	6.11
967	Other Organisation	Data Collection		Written Response	6.3
968	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
969	Other Organisation	Community Relations		Written Response	6.6
970	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
971	Other Organisation	Community Relations		Written Response	6.9
972	Other Organisation	Community Investment Programme		Written Response	6.13
973	Independent Report	Infrastructure, Transport, Roads		Written Response	6.8
974	Other Organisation	Community Investment Programme		Written Response	6.13
975	Other Organisation	Employment		Written Response	6.6
976	Other Organisation	Community Relations		Written Response	6.9
977	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
978	NGO	Employment		Written Response	6.6
979	NGO	Community Investment Programme		Written Response	6.13
980	NGO	Employment		Written Response	6.6
981	NGO	Employment		Written Response	6.6
982	Independent Report	Community Investment Programme		Written Response	6.13
983	NGO	Data Collection		Written Response	6.3
984	NGO	Demography and Ethnicity		Written Response	6.3
985	Independent Report	Land Acquisition and Compensation		Written Response	6.7
986	NGO		Archaeology & Cultural Heritage	Written Response	5.1
987	NGO		Archaeology & Cultural Heritage	Written Response	5.5
988	NGO	Consultation		Written Response	6.9
989	Independent Report	ESIA Documentation and Translation		Written Response	6.3

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990	NGO		Landscape / Visual impacts	Written Response	5.11
991	Independent Report	Consultation		Written Response	6.7
992	Independent Report	Monitoring - Social		Written Response	8.3
993	Independent Report	Community Investment Programme		Written Response	6.13
994	Independent Report	Monitoring - Social		Written Response	8.3
995	NGO	General Construction Queries	PD - Reinstate & Erosion	Written Response	4.4
996	NGO	Consultation		Written Response	6.9
997	NGO	Community Investment Programme		Written Response	6.13
998	NGO	Tourism		Written Response	6.6
999	NGO	Community Investment Programme		Written Response	6.13
1000	NGO	Land Acquisition and Compensation		Written Response	6.7
1001	NGO	Employment		Written Response	6.6
1002	NGO	Community Investment Programme	Waste / Waste Water	Written Response	6.13
1003	NGO	Baseline		Written Response	6.4, 6.6
1004	NGO	Community Investment Programme		Written Response	6.13
1005	NGO	Baseline		Written Response	6.4
1006	NGO	Land Acquisition and Compensation		Written Response	6.7
1007	NGO	Baseline		Written Response	6.4
1008	NGO	Access to Energy		Written Response	6.8
1009	NGO	Baseline		Written Response	6.4
1010	NGO	Baseline		Written Response	6.4
1011	NGO	Employment		Written Response	6.6
1012	NGO	ESIA Documentation and Translation	Methodology & Approach	Written Response	4.10, 6.3
1013	NGO	Data Collection	Methodology & Approach	Written Response	4.10, 6.3
1014	NGO	Employment		Written Response	6.6
1015	NGO	Baseline	Methodology & Approach	Written Response	4.10, 6.4
1016	NGO	Consultation		Written Response	6.9
1017	NGO	Community Investment Programme		Written Response	6.13
1018	NGO	Consultation		Written Response	6.9
1019	NGO	Monitoring - Social		Written Response	8.3
1020	NGO	General Construction Queries	Construction - Environment	Written Response	4.10, 5.11, 6.12
1021	NGO	Land Acquisition and Compensation		Written Response	6.7
1022	NGO	Issues around Borjomi		Written Response	5.14
1023	NGO	ESIA Documentation and Translation		Written Response	6.3
1024	NGO	ESIA Documentation and Translation		Written Response	6.3
1025	NGO	Water (social aspects)		Written Response	6.8
1026	NGO	Management Plans	Environmental Management Plans	Written Response	8.2, 8.3
1027	NGO	General Construction Queries		Written Response	6.9
1028	NGO	General Construction Queries		Written Response	6.9
1029	NGO	General Construction Queries	Construction - Environment	Written Response	6.9, 8.2
1030	NGO	General Construction Queries	Construction - Environment	Written Response	6.9
1031	NGO	Cumulative and Residual Impacts		Written Response	6.10, 6.12
1032	NGO	Cumulative and Residual Impacts		Written Response	6.12
1033	NGO	Health		Written Response	6.10
1034	NGO	Baseline		Written Response	6.10
1035	NGO	Water (social aspects)		Written Response	6.8
1036	NGO	Management Plans		Written Response	8.3
1037	NGO	Cumulative and Residual Impacts	Cumulative Impacts - Environment	Written Response	5.11, 7.2, 6.12
1038	NGO	Access to Energy		Written Response	6.8
1039	NGO	Land Acquisition and Compensation		Written Response	6.7
1040	NGO	Land Acquisition and Compensation		Written Response	6.7
1041	NGO	Community Investment Programme		Written Response	6.13
1042	NGO	Borjomi	Oil Spill Mitigation	Written Response	5.14
1043	NGO	Management Plans	Environmental Management Plans	Written Response	8.2, 8.3

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1044	NGO	Monitoring - Social	Environmental Management Plans	Written Response	8.2, 8.3
1045	NGO	Monitoring - Social		Written Response	8.3
1046	NGO	Monitoring - Social		Written Response	6.8,6.13
1047	NGO	Monitoring - Social		Written Response	8.3
1048	NGO		Residual impacts - Environment	Written Response	4.10
1049	NGO		PD - Risk Assessment	Written Response	4.9
1050	NGO	Management plans		Written Response	8.3
1051	NGO	Monitoring - Social		Written Response	8.3
1052	NGO	Infrastructure, Transport, Roads		Written Response	6.8
1053	NGO	Water (social aspects)		Written Response	6.8
1054	NGO	Monitoring - Social	Environmental Management Plans	Written Response	8
1055	NGO	Procurement		Written Response	6.6
1056	NGO	Monitoring - Social	Environmental Management Plans	Written Response	8.2, 8.3
1057	NGO	Management plans	Environmental Management Plans	Written Response	8.3
1058	NGO	Data Collection		Written Response	6.3
1059	NGO	Consultation		Written Response	6.9
1060	NGO	Consultation		Written Response	6.9
1061	NGO		Flora and Fauna	Written Response	5.11, 6.4
1062	NGO	Data Collection		Written Response	6.3
1063	NGO	Management plans	Environmental Management Plans	Written Response	8.2, 8.3
1064	NGO	Consultation		Written Response	6.9
1065	NGO	Consultation		Written Response	6.9
1066	NGO	Consultation		Written Response	6.9
1067	NGO	Consultation		Written Response	6.9
1068	NGO	Consultation		Written Response	6.9
1069	NGO	Consultation		Written Response	6.9
1070	NGO	Consultation		Written Response	6.9
1071	NGO	Consultation		Written Response	6.9
1072	NGO	Management plans		Written Response	8.3
1073	Independent Report	Employment		Written Response	6.4
1074	Government and Regulators	Access to Energy		Written Response	6.5
1075	Private Individual		Forests	Feedback Form	5.11
1076	Private Individual		PD - Reinstate & Erosion	Feedback Form	4.4
1077	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
1078	Private Individual		Erosion	Feedback Form	5.6, 5.11
1079	Private Individual		Erosion	Feedback Form	4.4
1080	Private Individual		Soil	Feedback Form	5.6, 8.2
1081	Private Individual		AGIs - Environment	Feedback Form	5.14
1082	Private Individual		Surface Water (rivers and lakes)	Feedback Form	5.14
1083	Private Individual	Project Support	Project Description	Feedback Form	4, 6.2
1084	Private Individual	Support for Project		Feedback Form	6.2
1085	Private Individual	Support for Project		Feedback Form	6.3
1086	Private Individual	Security	Environmental Security	Feedback Form	6.10
1087	Private Individual		PD - System construction	Feedback Form	4.2
1088	Private Individual		Operation - Environment	Feedback Form	4.5
1089	Private Individual		Unplanned Events	Feedback Form	5.11, 7.2
1090	Private Individual		Seismicity	Feedback Form	5.5
1091	Private Individual		PD - Project Design Basis	Feedback Form	4.1
1092	Private Individual		HydroGeology / Geomorphology	Feedback Form	5.8
1093	Private Individual	Community Investment Programme		Feedback Form	6.13
1094	Private Individual	Community Investment Programme		Feedback Form	6.13
1095	Private Individual	Other Compensation		Feedback Form	6.13
1096	Private Individual	Access to Energy		Feedback Form	6.5
1097	Private Individual	Community Investment Programme		Feedback Form	6.13
1098	Private Individual		AGIs - Environment	Feedback Form	4.5
1099	Private Individual	Support for Project		Feedback Form	6.2
1100	Private Individual	Safety		Feedback Form	6.10
1101	Private Individual	Security		Feedback Form	6.10
1102	Private Individual		Archaeology & Cultural Heritage	Feedback Form	5.1
1103	Private Individual	Support for Project		Feedback Form	6.2
1104	Private Individual		Flora and Fauna	Feedback Form	5.11
1105	Private Individual		Archaeology & Cultural Heritage	Feedback Form	5.1
1106	Private Individual	Support for Project		Feedback Form	6.2
1107	Private Individual	Employment		Feedback Form	6.6
1108	Private Individual	Employment		Feedback Form	6.6

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1109	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1110	Private Individual	Reinstatement		Feedback Form	6.9
1111	Private Individual		Legal Compliance (standards) - environment	Feedback Form	4.5
1112	Private Individual	Employment		Feedback Form	6.6
1113	Private Individual	Employment		Feedback Form	6.6
1114	Private Individual	Safety		Feedback Form	6.10
1115	Private Individual	Support for Project		Feedback Form	6.2
1116	Private Individual	Other Compensation	Flora and Fauna	Feedback Form	5.11, 6.13
1117	Private Individual		Archaeology & Cultural Heritage	Feedback Form	5.1
1118	Private Individual	Support for Project		Feedback Form	6.2
1119	NGO		Legal Compliance (standards) - environment	Written Response	8.2
1120	NGO		Oil Spill Modelling	Written Response	5.14
1121	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1122	Private Individual	Access to Energy		Feedback Form	6.5
1123	Private Individual	Community Investment Programme		Feedback Form	6.13
1124	Private Individual	Employment		Feedback Form	6.6
1125	Private Individual	Employment		Feedback Form	6.6
1126	Private Individual	Other Compensation		Feedback Form	6.13
1127	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1128	Private Individual	Employment		Feedback Form	6.6
1129	Private Individual	Other Compensation		Feedback Form	6.7
1130	Private Individual	Employment		Feedback Form	6.6
1131	Private Individual	Employment		Feedback Form	6.6
1132	Private Individual	Other Compensation		Feedback Form	6.13
1133	Private Individual	Employment		Feedback Form	6.6
1134	Private Individual	Employment		Feedback Form	6.6
1135	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7, 6.8
1136	Private Individual	Employment		Feedback Form	6.6
1137	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1138	Private Individual	Employment		Feedback Form	6.6
1139	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1140	Private Individual	Employment		Feedback Form	6.6
1141	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1142	Private Individual	Community Investment Programme		Feedback Form	6.13
1143	Private Individual	Employment		Feedback Form	6.6
1144	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1145	Private Individual	Community Investment Programme		Feedback Form	6.13
1146	Private Individual	Community Investment Programme		Feedback Form	6.13
1147	Private Individual	Community Investment Programme		Feedback Form	6.13
1148	Private Individual	Employment		Feedback Form	6.6
1149	Private Individual	Government Relations		Feedback Form	6.6
1150	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1151	Private Individual	Access to Energy		Feedback Form	6.5
1152	Private Individual	Employment		Feedback Form	6.10
1153	Private Individual	Community Investment Programme		Feedback Form	6.13
1154	Private Individual	Employment		Feedback Form	6.6
1155	Private Individual	Community Investment Programme		Feedback Form	6.13
1156	Private Individual	Community Investment Programme		Feedback Form	6.13
1157	Private Individual	Community Investment Programme	Noise	Feedback Form	5.4, 6.13
1158	Private Individual	Employment		Feedback Form	6.6
1159	Private Individual	Constuction Camps and Pipeyards		Feedback Form	6.9
1160	Private Individual	Community Investment Programme		Feedback Form	6.13
1161	Private Individual		PD - Reinstate & Erosion	Feedback Form	4.4
1162	Private Individual	Community Investment Programme		Feedback Form	6.13
1163	Private Individual	Employment		Feedback Form	6.6
1164	Private Individual	Employment		Feedback Form	6.6
1165	Private Individual	Employment		Feedback Form	6.6

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1166	Private Individual	Procurement		Feedback Form	6.6
1167	Private Individual	Other Compensation		Feedback Form	6.13
1168	Private Individual		Route	Feedback Form	6.7
1169	Private Individual	Employment		Feedback Form	6.6
1170	Private Individual		Construction - Environment	Feedback Form	4.5
1171	Private Individual	Procurement		Feedback Form	6.6
1172	Private Individual	Employment		Feedback Form	6.6
1173	Private Individual	Community Investment Programme		Feedback Form	6.13
1174	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1175	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1176	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1177	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1178	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1179	Private Individual	Procurement		Feedback Form	6.6
1180	Private Individual	Community Investment Programme		Feedback Form	6.13
1181	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1182	Private Individual	Employment		Feedback Form	6.6
1183	Private Individual	Community Investment Programme	Noise	Feedback Form	5.4, 6.13
1184	Private Individual	Community Investment Programme		Feedback Form	6.13
1185	Private Individual	Water (social aspects)	water environmental	Feedback Form	5.8, 6.8
1186	Private Individual	Other Compensation		Feedback Form	6.13
1187	Private Individual	Community Investment Programme		Feedback Form	6.13
1188	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
1189	Private Individual	Consultation		Feedback Form	6.9
1190	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1191	Private Individual	Government Relations		Feedback Form	6.5
1192	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1193	Private Individual	Water (social aspects)	water environmental	Feedback Form	5.8, 6.8
1194	Private Individual	Community Investment Programme		Feedback Form	6.13
1195	Private Individual	Support for Project		Feedback Form	6.2
1196	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1197	Private Individual	Employment		Feedback Form	6.6
1198	Private Individual	Other Compensation		Feedback Form	6.7, 6.9
1199	Private Individual	Other Compensation		Feedback Form	6.13
1200	Private Individual	Access to Energy		Feedback Form	6.5
1201	Private Individual	Constuction Camps and Pipeyards		Feedback Form	6.9
1202	Private Individual	Employment		Feedback Form	6.6
1203	Private Individual	Employment		Feedback Form	6.6
1204	Private Individual	Employment		Feedback Form	6.6
1205	Private Individual	Access to Energy		Feedback Form	6.5
1206	Private Individual	Employment		Feedback Form	6.6
1207	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1208	Private Individual	Other Compensation		Feedback Form	6.10
1209	Private Individual		Air Quality	Feedback Form	5.3
1210	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1211	Private Individual	Procurement		Feedback Form	6.6
1212	Private Individual	Safety		Feedback Form	6.10
1213	Private Individual	Land Use Restrictions	PD - Reinstate & Erosion	Feedback Form	4.4
1214	Private Individual		Route	Feedback Form	3
1215	Private Individual	Employment		Feedback Form	6.6
1216	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1217	Private Individual	Safety		Feedback Form	6.10
1218	Private Individual	Employment		Feedback Form	6.6
1219	Private Individual	Employment		Feedback Form	6.6
1220	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1221	Private Individual	Employment		Feedback Form	6.6
1222	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1223	Private Individual	Community Relations		Feedback Form	6.9

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1224	Private Individual	Safety		Feedback Form	6.10
1225	Private Individual	Unplanned events		Feedback Form	6.9
1226	Private Individual		Legal Compliance (standards) - environment	Feedback Form	8.2
1227	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1228	Private Individual	Access to Energy		Feedback Form	6.5
1229	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1230	Private Individual	Employment		Feedback Form	6.6
1231	Private Individual	Other Compensation		Feedback Form	6.13
1232	Private Individual	ESIA Documentation and Translation		Feedback Form	6.3
1233	Private Individual	Community Investment Programme		Feedback Form	6.13
1234	Private Individual	Other Compensation	PD - Reinstate & Erosion	Feedback Form	4.4
1235	Private Individual		Fish / fisheries	Feedback Form	5.11
1236	Private Individual	Other Compensation		Feedback Form	6.13
1237	Private Individual		Forests	Feedback Form	5.11
1238	Private Individual	Employment		Feedback Form	6.6
1239	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
1240	NGO		Oil Spill Modelling	Written Response	5.14
1241	NGO		Oil Spill Modelling	Written Response	5.14
1242	NGO	Security		Written Response	6.10
1243	NGO		Route	Written Response	3
1244	Government and Regulators	Community Investment Programme		Written Response	6.13
1245	Government and Regulators	Community Investment Programme		Written Response	6.13
1246	Government and Regulators	Community Investment Programme		Written Response	6.13
1247	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.8
1248	Government and Regulators	Community Investment Programme		Written Response	6.13
1249	Government and Regulators	Community Investment Programme		Written Response	6.13
1250	Government and Regulators	Procurement		Written Response	6.6
1251	Government and Regulators	Procurement		Written Response	6.6
1252	Government and Regulators	Community Investment Programme		Written Response	6.13
1253	Government and Regulators	Procurement		Written Response	6.6
1254	Independent Report	Data Collection		Written Response	6.3
1255	Independent Report	Macroeconomics		Written Response	6.3
1256	Independent Report	Baseline		Written Response	6.4
1257	Independent Report	Data Collection		Written Response	6.3
1258	Independent Report	Macroeconomics		Written Response	6.3
1259	Independent Report	Employment		Written Response	6.6
1260	Independent Report	Employment		Written Response	6.6
1261	Independent Report	Employment		Written Response	6.6
1262	Independent Report	Employment		Written Response	6.6
1263	Independent Report	Employment		Written Response	6.9
1264	Independent Report	Employment		Written Response	6.6
1265	Independent Report	Land Acquisition and Compensation		Written Response	6.7
1266	Independent Report	Land Acquisition and Compensation		Written Response	6.7
1267	Independent Report	Infrastructure, Transport, Roads		Written Response	6.8
1268	Independent Report	Demography and Ethnicity		Written Response	6.9
1269	Independent Report	Demography and Ethnicity		Written Response	6.9
1270	Independent Report	Baseline		Written Response	6.4
1271	Independent Report	Employment		Written Response	6.6
1272	Independent Report	Employment		Written Response	6.6
1273	Independent Report	Employment		Written Response	6.6
1274	Independent Report	Land Acquisition and Compensation		Written Response	6.7
1275	Independent Report	Baseline		Written Response	6.4
1276	Independent Report	Employment		Written Response	6.6
1277	Independent Report	Employment		Written Response	6.6
1278	Independent Report	Monitoring - Social		Written Response	8.3
1279	Independent Report	Community Relations		Written Response	6.9
1280	Independent Report	Employment		Written Response	6.6
1281	Independent Report	Land Acquisition and Compensation		Written Response	6.7
1282	Independent Report	Community Relations		Written Response	6.9
1283	Private Individual	Tariffs		Feedback Form	6.11

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1284	Private Individual	Land Use Restrictions		Feedback Form	6.7
1285	Private Individual		Cumulative Impacts - Environment	Feedback Form	7.2
1286	Government and Regulators	Baseline		Written Response	6.4
1287	Government and Regulators	Management Plans		Written Response	8.3
1288	Government and Regulators	Management Plans		Written Response	8.3
1289	Government and Regulators		Route	Written Response	3
1290	Government and Regulators	Consultation		Written Response	6.9
1291	Government and Regulators		Project Alternatives	Written Response	3
1292	Government and Regulators		Route	Written Response	3
1293	Government and Regulators	ESIA Documentation and Translation		Written Response	6.3
1294	Government and Regulators		Route	Written Response	3
1295	Government and Regulators		Legal Compliance (standards) - environment	Written Response	5.12
1296	Government and Regulators		PD - Project Design Basis	Written Response	8.2
1297	Government and Regulators	General Construction Queries		Written Response	6.9
1298	Government and Regulators		Cumulative Impacts - Environment	Written Response	5.14
1299	Government and Regulators	Issues around Borjomi		Written Response	5.14
1300	Government and Regulators	Tourism		Written Response	5.14, 6.6
1301	Government and Regulators		Route	Written Response	5.14
1302	Government and Regulators	Issues around Borjomi		Written Response	5.14
1303	Government and Regulators		Environmental Management Plans	Written Response	8.2
1304	Government and Regulators	Management Plans		Written Response	8.3
1305	Government and Regulators	Management Plans		Written Response	8.3
1306	Government and Regulators	Monitoring - Social		Written Response	8.3
1307	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
1308	Government and Regulators	Monitoring - Social		Written Response	8.3
1309	Government and Regulators	Management Plans		Written Response	8.3
1310	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
1311	Government and Regulators	ESIA Documentation and Translation	Construction - Environment	Written Response	6.11
1312	Government and Regulators	Health		Written Response	6.10
1313	Government and Regulators	Health		Written Response	6.10
1314	Government and Regulators	Baseline		Written Response	6.4
1315	Government and Regulators	Health		Written Response	6.10
1316	Government and Regulators	Baseline		Written Response	6.4
1317	Government and Regulators	Water (social aspects)		Written Response	6.4, 6.8
1318	Government and Regulators	Water (social aspects)		Written Response	6.4
1319	Government and Regulators		PD - System construction	Written Response	4.2
1320	Government and Regulators		Anthrax	Written Response	5.7
1321	Government and Regulators	ESIA Documentation and Translation		Written Response	6.9
1322	Government and Regulators	Consultation		Written Response	6.9
1323	Government and Regulators	Consultation		Written Response	6.9
1324	Government and Regulators	Consultation		Written Response	6.9

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1325	Government and Regulators	Consultation		Written Response	6.9
1326	Government and Regulators	Consultation		Written Response	6.9
1327	Government and Regulators	Consultation		Written Response	6.9
1328	Government and Regulators	Consultation		Written Response	6.9
1329	Government and Regulators	Consultation		Written Response	6.9
1330	Government and Regulators	Consultation		Written Response	6.9
1331	Government and Regulators	Consultation		Written Response	6.9
1332	Government and Regulators	Consultation		Written Response	6.9
1333	Government and Regulators	Consultation		Written Response	6.9
1334	Government and Regulators	Consultation		Written Response	6.9
1335	Government and Regulators	Consultation		Written Response	6.9
1336	Government and Regulators	Consultation		Written Response	6.9
1337	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
1338	Government and Regulators	Employment		Written Response	6.6
1339	Government and Regulators	Employment		Written Response	6.6
1340	Government and Regulators	Community Investment Programme		Written Response	6.13
1341	NGO		Approach & Methodology	Written Response	4.10
1342	NGO	ESIA Documentation and Translation	Approach & Methodology	Written Response	4.10, 6.3
1343	NGO	ESIA Documentation and Translation		Written Response	6.3
1344	NGO	International Standards and Legal Compliance (social)		Written Response	6.11
1345	NGO	Management Plans	Approach & Methodology	Written Response	4.10, 8.3
1346	NGO	Tourism		Written Response	6.6
1347	NGO	Baseline		Written Response	6.4
1348	NGO	ESIA Documentation and Translation	Approach & Methodology	Written Response	4.10, 6.3
1349	NGO	International Standards and Legal Compliance (social)		Written Response	6.11
1350	NGO	ESIA Documentation and Translation	Legal Compliance (standards) - environment	Written Response	5.12, 6.3
1351	NGO		Approach & Methodology	Written Response	4.10
1352	NGO	Safety		Written Response	6.10
1353	NGO	Land Acquisition and Compensation		Written Response	6.7
1354	NGO		Noise	Written Response	5.4
1355	NGO	Tourism		Written Response	6.6
1356	NGO	International Standards and Legal Compliance (social)		Written Response	6.11
1357	NGO	Baseline		Written Response	6.4
1358	NGO	Health		Written Response	6.10
1359	NGO	Infrastructure, Transport, Roads		Written Response	6.8
1360	NGO		Noise	Written Response	5.4
1361	NGO		Unplanned events	Written Response	5.14
1362	NGO		PD - Outline of Pipeline & Facilities	Written Response	4.2
1363	NGO	Security		Written Response	6.10
1364	NGO		Approach & Methodology	Written Response	4.1
1365	Other Organisation	Employment		Written Response	6.6
1366	Other Organisation	Procurement		Written Response	6.2
1367	Other Organisation	Procurement		Written Response	6.6
1368	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
1369	Other Organisation	Infrastructure, Transport, Roads		Written Response	6.8
1370	Other Organisation	Employment		Written Response	6.6
1371	Other Organisation	Tariffs		Written Response	6.11
1372	Other Organisation	Access to Energy		Written Response	6.5
1373	Other Organisation	Access to Energy		Written Response	6.5
1374	Other Organisation	Tariffs		Written Response	6.11
1375	Other Organisation		Project Description	Written Response	4
1376	Other Organisation	Support for Project		Written Response	6.2
1377	Other Organisation	Tariffs		Written Response	6.11

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1378	Other Organisation	Macroeconomics		Written Response	6.11
1379	Other Organisation	Baseline		Written Response	6.4
1380	Other Organisation	Consultation		Written Response	6.9
1381	Other Organisation	Support for Project		Written Response	6.2
1382	Other Organisation	ESIA Documentation and Translation		Written Response	6.9
1383	Other Organisation	Baseline		Written Response	6.4
1384	Other Organisation	Baseline		Written Response	6.4
1385	Other Organisation	Macroeconomics		Written Response	6.3
1386	Other Organisation	Baseline		Written Response	6.4
1387	Other Organisation	Baseline		Written Response	6.4
1388	Other Organisation	Baseline		Written Response	6.4
1389	Other Organisation	Health		Written Response	6.4
1390	Other Organisation	Baseline		Written Response	6.4
1391	Other Organisation	Data Collection		Written Response	6.4
1392	Other Organisation	Baseline		Written Response	6.4
1393	Other Organisation	Baseline		Written Response	6.4
1394	Other Organisation	Baseline		Written Response	6.4
1395	Other Organisation	ESIA Documentation and Translation		Written Response	6.3
1396	Other Organisation	ESIA Documentation and Translation		Written Response	6.3
1397	Other Organisation	Employment		Written Response	6.6
1398	Other Organisation	Employment		Written Response	6.6
1399	Other Organisation	Employment		Written Response	6.6
1400	Government and Regulators	Safety		Written Response	6.10
1401	Government and Regulators	Support for Project		Written Response	6.2
1402	Government and Regulators	Unplanned events		Written Response	6.10
1403	Government and Regulators	Unplanned events		Written Response	6.10
1404	Government and Regulators	Unplanned events		Written Response	6.10
1405	Government and Regulators	Water (social aspects)		Written Response	6.8
1406	Government and Regulators	Water (social aspects)		Written Response	6.8
1407	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
1408	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1409	Government and Regulators	Issues around Borjomi		Written Response	5.14
1410	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
1411	Government and Regulators		Approach & Methodology	Written Response	4.10
1412	Government and Regulators	ESIA Documentation and Translation		Written Response	6.3
1413	Government and Regulators	Baseline	Approach & Methodology	Written Response	4.10, 6.4
1414	Government and Regulators	ESIA Documentation and Translation		Written Response	6.3
1415	Government and Regulators	ESIA Documentation and Translation		Written Response	6.3
1416	Government and Regulators		Seismicity	Written Response	5.5
1417	Government and Regulators		Route	Written Response	3
1418	Government and Regulators		Route	Written Response	5.14
1419	Government and Regulators	Tourism		Written Response	5.14, 6.6
1420	Government and Regulators	Issues around Borjomi		Written Response	5.14
1421	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1422	Government and Regulators		Waste / Waste Water	Written Response	4.8
1423	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
1424	Government and Regulators	Management Plans		Written Response	6.13, 6.10
1425	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
1426	Government and Regulators	Management Plans		Written Response	8.3
1427	Government and Regulators	Management Plans	Environmental Management Plans	Written Response	8.2, 8.3

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1428	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
1429	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7, 6.11
1430	Government and Regulators	Health	PD - System construction	Written Response	4.2
1431	Government and Regulators	Baseline	Environmental Monitoring	Written Response	6.4, 8.2
1432	Government and Regulators	Health		Written Response	6.10
1433	Government and Regulators	Baseline		Written Response	6.4
1434	Government and Regulators	Baseline	water environmental	Written Response	5.8, 6.4
1435	Government and Regulators	Baseline	water environmental	Written Response	5.8, 6.4
1436	Government and Regulators		Waste / Waste Water	Written Response	5.8
1437	Government and Regulators		PD - System construction	Written Response	4.2
1438	Government and Regulators		Anthrax	Written Response	5.7
1439	Government and Regulators	Community Investment Programme		Written Response	6.13
1440	Government and Regulators	Consultation		Written Response	6.9
1441	Government and Regulators	Consultation		Written Response	6.9
1442	Government and Regulators	Consultation		Written Response	8.3
1443	Government and Regulators	Community Investment Programme		Written Response	6.13
1444	Government and Regulators	Community Investment Programme		Written Response	6.13
1445	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
1446	Government and Regulators	Employment		Written Response	6.6
1447	Government and Regulators	Community Investment Programme		Written Response	6.13
1448	Government and Regulators	Community Investment Programme		Written Response	6.13
1449	Government and Regulators	Community Investment Programme		Written Response	6.13
1450	Government and Regulators	Community Investment Programme	Waste / Waste Water	Written Response	5.8, 6.13
1451	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.8
1452	Government and Regulators	Demography and Ethnicity		Written Response	6.7
1453	Government and Regulators		Anthrax	Written Response	5.7, 1453a
1454	Government and Regulators		Anthrax	Written Response	5.7, 1454a
1455	Government and Regulators		Anthrax	Written Response	5.7
1456	Government and Regulators	Consultation	Anthrax	Written Response	5.7, 6.9
1457	Government and Regulators	Water (social aspects)		Written Response	6.8
1458	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
1459	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1460	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
1461	Government and Regulators	Reinstatement	PD - Reinstate & Erosion	Written Response	4.4
1462	Government and Regulators	Tourism	Construction - Environment	Written Response	6.6, 8.2
1463	Government and Regulators	Community Investment Programme	Environmental Investment Programme	Written Response	6.13
1464	Government and Regulators	Community Investment Programme		Written Response	6.13
1465	Government and Regulators	Health		Written Response	6.10
1466	Government and Regulators	Community Investment Programme		Written Response	6.13
1467	Government and Regulators	Community Investment Programme		Written Response	6.13

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1468	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1469	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1470	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1471	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1472	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1473	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1474	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1475	Government and Regulators	Community Investment Programme		Written Response	6.9
1476	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
1477	Government and Regulators	Employment		Written Response	6.6
1478	Government and Regulators	Unplanned events		Written Response	6.10, 6.10
1479	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.8
1480	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.9
1481	Government and Regulators	Reinstatement	Soil	Written Response	5.6, 6.7, 6.7
1482	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.8
1483	Government and Regulators		Landscape / Visual Impacts	Written Response	5.9
1484	Government and Regulators	Tourism		Written Response	6.6
1485	Government and Regulators	ESIA Documentation and Translation		Written Response	6.3
1486	Government and Regulators	Tourism		Written Response	6.6
1487	Government and Regulators	ESIA Documentation and Translation		Written Response	6.10
1488	Government and Regulators	ESIA Documentation and Translation		Written Response	6.4
1489	Government and Regulators	ESIA Documentation and Translation		Written Response	6.9
1490	Government and Regulators	ESIA Documentation and Translation		Written Response	6.2
1491	Government and Regulators	ESIA Documentation and Translation		Written Response	6.6
1492	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	8.2, 8.3
1493	Government and Regulators	ESIA Documentation and Translation		Written Response	6.11, 6.7
1494	Government and Regulators	Baseline		Written Response	6.4
1495	Government and Regulators	Water (social aspects)		Written Response	6.8
1496	Government and Regulators		PD - System construction	Written Response	4.2
1497	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1498	Government and Regulators		PD - Project design basis	Written Response	4.1
1499	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.8
1500	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1501	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1502	Government and Regulators	Water (social aspects)	HydroGeology / Geomorphology	Written Response	5.8, 6.8
1503	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
1504	Government and Regulators		Project Description	Written Response	5.5
1505	Government and Regulators	Infrastructure, Transport, Roads	Project Description	Written Response	6.8
1506	Government and Regulators		Project Description	Written Response	4
1507	Government and Regulators		Project Description	Written Response	4

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1508	Government and Regulators		Oil Spill Modelling	Written Response	5.14
1509	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1510	Government and Regulators		Project Description	Written Response	4
1511	Government and Regulators		Project Description	Written Response	4
1512	Government and Regulators		Project Description	Written Response	4
1513	Government and Regulators	Community Investment Programme	Flora and Fauna	Written Response	5.11, 6.13
1514	Government and Regulators		Forestry	Written Response	5.11
1515	Government and Regulators	Community Investment Programme	PD - Reinstate & Erosion	Written Response	4.4
1516	Government and Regulators		Soil	Written Response	5.6
1517	Government and Regulators		Project Description	Written Response	4
1518	Government and Regulators		Environmental Management Plans	Written Response	8
1519	Government and Regulators	Safety	Waste / Waste Water	Written Response	6.10
1520	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
1521	Government and Regulators		Environmental Management Plans	Written Response	8
1522	Government and Regulators	Infrastructure, Transport, Roads	Construction - Environment	Written Response	6.8
1523	Government and Regulators		Construction - Environment	Written Response	5.6, 6.7
1524	Government and Regulators		Waste / Waste Water	Written Response	5.8
1525	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	6.11, 8.2
1526	Government and Regulators		Project Description	Written Response	4
1527	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1528	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1529	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1530	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1531	Government and Regulators		Project Description	Written Response	4
1532	Government and Regulators		Construction - Environment	Written Response	4.5
1533	Government and Regulators	Data Collection		Written Response	6.3
1534	Government and Regulators	Unplanned Events	Unplanned events	Written Response	6.8, 6.10
1535	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1536	Government and Regulators		Landscape / Visual Impacts	Written Response	5.9
1537	Government and Regulators		Flora and Fauna	Written Response	5.11
1538	Government and Regulators		Unplanned events	Written Response	4.9
1539	Government and Regulators		Environmental Management Plans	Written Response	8.2
1540	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1541	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1542	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1543	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1544	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1545	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1546	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1547	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5

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1548	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1549	Government and Regulators		PD - Ops Control & Maintenance	Written Response	4.5
1550	Government and Regulators		Construction - Environment	Written Response	4.5
1551	Government and Regulators		Waste / Waste Water	Written Response	4.8
1552	Government and Regulators		Unplanned events	Written Response	4.9
1553	Government and Regulators		Project Alternatives	Written Response	3
1554	Government and Regulators	Tourism	Landscape / Visual Impacts	Written Response	5.9, 6.6
1555	Government and Regulators		Geohazards	Written Response	5.5
1556	Government and Regulators	Consultation	Approach & Methodology	Written Response	6.9
1557	Government and Regulators	Water (social aspects)	HydroGeology / Geomorphology	Written Response	6.8
1558	Government and Regulators	General Construction Queries	Noise	Written Response	6.9, 5.11, 5.4
1559	Government and Regulators	General Construction Queries	Forestry	Written Response	6.9, 5.11
1560	Government and Regulators		water environmental	Written Response	5.8
1561	Government and Regulators	Tourism	Forestry	Written Response	5.11, 6.6
1562	Government and Regulators		Oil Spill Modelling	Written Response	4.9
1563	Government and Regulators		Project Alternatives	Written Response	3
1564	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
1565	Government and Regulators		Oil Spill Modelling	Written Response	5.5
1566	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
1567	Government and Regulators		Project Description	Written Response	4
1568	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
1569	Government and Regulators		Flora and Fauna	Written Response	5.11
1570	Government and Regulators		Flora and Fauna	Written Response	5.11
1571	Government and Regulators		Fish / fisheries	Written Response	5.11
1572	Government and Regulators	Land Use Restrictions		Written Response	6.7
1573	Government and Regulators		Fish / fisheries	Written Response	5.11
1574	Government and Regulators		Flora and Fauna	Written Response	5.11
1575	Government and Regulators		Environmental Management Plans	Written Response	8
1576	Government and Regulators		Flora and Fauna	Written Response	5.11
1577	Government and Regulators		Flora and Fauna	Written Response	5.11
1578	Government and Regulators		Flora and Fauna	Written Response	5.11
1579	Government and Regulators		Flora and Fauna	Written Response	5.11
1580	Government and Regulators		Flora and Fauna	Written Response	5.11
1581	Government and Regulators		Flora and Fauna	Written Response	5.11
1582	Government and Regulators		Flora and Fauna	Written Response	5.11
1583	Government and Regulators		Flora and Fauna	Written Response	5.11
1584	Government and Regulators		Flora and Fauna	Written Response	5.11
1585	Government and Regulators		Flora and Fauna	Written Response	5.11
1586	Government and Regulators		Flora and Fauna	Written Response	5.11
1587	Government and Regulators		Flora and Fauna	Written Response	5.11

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1588	Government and Regulators		Flora and Fauna	Written Response	5.11
1589	Government and Regulators		Flora and Fauna	Written Response	5.11
1590	Government and Regulators		Flora and Fauna	Written Response	5.11
1591	Government and Regulators		Flora and Fauna	Written Response	5.11
1592	Government and Regulators		Flora and Fauna	Written Response	5.11
1593	Government and Regulators		Flora and Fauna	Written Response	5.11
1594	Independent Report	General Construction Queries	Construction - Environment	Written Response	5.11, 7.2, 8.2, 6.9
1595	Independent Report		Cumulative Impacts - Environment	Written Response	5.11, 7.2
1596	Independent Report		Flora and Fauna	Written Response	5.11
1597	Independent Report		Flora and Fauna	Written Response	5.11
1598	Independent Report		Forestry	Written Response	5.11
1599	Independent Report		Flora and Fauna	Written Response	5.11
1600	Independent Report		water environmental	Written Response	5.8
1601	Independent Report		HydroGeology / Geomorphology	Written Response	5.5, 5.14
1602	Independent Report		Archaeology & Cultural Heritage	Written Response	5.1
1603	Independent Report		Approach & Methodology	Written Response	3
1604	Independent Report		Approach & Methodology	Written Response	3
1605	Independent Report		Construction - environment	Written Response	5.7
1606	Independent Report		water environmental	Written Response	5.11
1607	Independent Report		Flora and Fauna	Written Response	5.11
1608	Independent Report		Air Quality	Written Response	5.3
1609	Independent Report		Landscape / Visual Impacts	Written Response	5.9
1610	Independent Report		Flora and Fauna	Written Response	5.11
1611	Independent Report		Flora and Fauna	Written Response	5.11
1612	Independent Report		Flora and Fauna	Written Response	5.11
1613	Independent Report		Environmental Management Plans	Written Response	8
1614	Independent Report		Environmental Management Plans	Written Response	8
1615	Independent Report		Cumulative Impacts - Environment	Written Response	5.11, 7.2
1616	Independent Report		Legal Compliance (standards) - environment	Written Response	8.2
1617	Independent Report		Air Quality	Written Response	5.3
1618	Independent Report		Construction - environment	Written Response	4.5
1619	Independent Report		Oil Spill Modelling	Written Response	4.9
1620	Independent Report		Forestry	Written Response	5.11
1621	Independent Report		Noise	Written Response	5.4
1622	Independent Report		water environmental	Written Response	5.11
1623	Independent Report		Protected areas	Written Response	5.12
1624	Independent Report		Climate	Written Response	5.2
1625	Independent Report		Geohazards	Written Response	5.5
1626	Independent Report		Flora and Fauna	Written Response	5.11
1627	Independent Report		Flora and Fauna	Written Response	5.11
1628	Independent Report		Flora and Fauna	Written Response	5.11
1629	Independent Report		Forestry	Written Response	5.11
1630	Independent Report		Flora and Fauna	Written Response	5.11
1631	Independent Report		Construction - Environment	Written Response	8.2
1632	Independent Report		Environmental Management Plans	Written Response	8
1633	Independent Report		Cumulative Impacts - Environment	Written Response	7.2
1634	Independent Report		Environmental Management Plans	Written Response	8
1635	Independent Report		Air Quality	Written Response	5.3
1636	Independent Report		Environmental Management Plans	Written Response	8.2
1637	Independent Report		Environmental Management Plans	Written Response	8.2
1638	Independent Report		Flora and Fauna	Written Response	5.11
1639	Independent Report		Oil Spill Mitigation	Written Response	5.14
1640	Independent Report		Environmental Management Plans	Written Response	8.2
1641	Independent Report		Environmental Monitoring	Written Response	8.2
1642	Independent Report		Construction - Environment	Written Response	5.8
1643	Independent Report	Management Plans	Legal Compliance (standards) - environment	Written Response	6.7, 6.13, 6.8, 8.2
1644	Independent Report		Flora and Fauna	Written Response	5.11

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1645	Independent Report		Forestry	Written Response	5.11
1646	Independent Report		Environmental Management Plans	Written Response	8.2
1647	Independent Report	ESIA Documentation and Translation	Unplanned events	Written Response	6.3
1648	Independent Report		water environmental	Written Response	4.10, 5.5
1649	Independent Report		Forestry	Written Response	5.11
1650	Independent Report		Environmental Management Plans	Written Response	8
1651	Independent Report		Environmental Management Plans	Written Response	8
1652	Independent Report		Flora and Fauna	Written Response	5.11
1653	Independent Report		Environmental Monitoring	Written Response	8.2
1654	Independent Report		Environmental Management Plans	Written Response	8
1655	Independent Report		Fish / fisheries	Written Response	5.11
1656	Independent Report		HydroGeology / Geomorphology	Written Response	5.8
1657	Independent Report		Construction - environment	Written Response	5.8, 8.2
1658	Independent Report		Environmental Management Plans	Written Response	8
1659	Independent Report		Construction - environment	Written Response	5.8
1660	Independent Report		Archaeology & Cultural Heritage	Written Response	5.1
1661	Independent Report		Air Quality	Written Response	5.3
1662	Independent Report		Air Quality	Written Response	5.3
1663	Independent Report	Community Relations	Noise	Written Response	6.9
1664	Independent Report		Environmental Management Plans	Written Response	5.8
1665	Independent Report		HydroGeology / Geomorphology	Written Response	5.14
1666	Independent Report		Construction - environment	Written Response	4.5
1667	Independent Report		Archaeology & Cultural Heritage	Written Response	5.1
1668	Independent Report		Environmental Management Plans	Written Response	8
1669	Independent Report		Landscape / Visual Impacts	Written Response	5.9
1670	Independent Report		HydroGeology / Geomorphology	Written Response	4.1, 5.14
1671	Independent Report		Oil Spill Modelling	Written Response	5.14
1672	Independent Report		Oil Spill Modelling	Written Response	5.14
1673	Independent Report		Environmental Management Plans	Written Response	8.2
1674	Independent Report		Environmental Investment Programme	Written Response	8.2
1675	Independent Report		Forestry	Written Response	5.11
1676	Independent Report		Flora and Fauna	Written Response	5.11
1677	Independent Report		Legal Compliance (standards) - environment	Written Response	4
1678	Independent Report		Cumulative Impacts - Environment	Written Response	7.2
1679	Independent Report		Air Quality	Written Response	5.3
1680	Independent Report		Noise	Written Response	5.4
1681	Independent Report		Noise	Written Response	5.4
1682	Independent Report		Construction - environment	Written Response	5.7
1683	Independent Report		Construction - environment	Written Response	5.7
1684	Independent Report		water environmental	Written Response	5.8
1685	Independent Report		Soil	Written Response	5.7
1686	Independent Report		Flora	Written Response	5.11
1687	Independent Report		Fish / fisheries	Written Response	5.11
1688	Independent Report		Protected areas	Written Response	5.12
1689	Independent Report		Flora	Written Response	5.11
1690	Independent Report		PD - Project Schedule	Written Response	4.2
1691	Independent Report		Noise	Written Response	5.4
1692	Independent Report		Archaeology & Cultural Heritage	Written Response	5.1
1693	Independent Report		Flora and Fauna	Written Response	5.11
1694	Independent Report		Flora and Fauna	Written Response	5.11
1695	Independent Report		Noise	Written Response	5.4
1696	Independent Report		Air Quality	Written Response	5.3
1697	Independent Report		Air Quality	Written Response	5.3
1698	Independent Report		Air Quality	Written Response	5.3
1699	Independent Report		Air Quality	Written Response	5.3
1700	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1701	Independent Report		PD - System Construction	Written Response	4.2
1702	Independent Report		PD - Wastes & Emissions	Written Response	4.5
1703	Independent Report		PD - Wastes & Emissions	Written Response	4.5
1704	Independent Report		PD - Wastes & Emissions	Written Response	4.5
1705	Independent Report		PD - Wastes & Emissions	Written Response	4.5

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1706	Independent Report		PD - Wastes & Emissions	Written Response	4.5
1707	Independent Report		PD - Wastes	Written Response	4.8
1708	Independent Report		PD - System Construction	Written Response	4.2
1709	Independent Report		PD - System Construction	Written Response	4.2
1710	Independent Report		PD - System Construction	Written Response	4.2
1711	Independent Report		PD - Wastes	Written Response	4.8
1712	Independent Report		PD - Wastes	Written Response	4.8
1713	Independent Report		PD - Wastes	Written Response	4.8
1714	Independent Report		PD - Wastes	Written Response	4.8
1715	Independent Report		PD - Wastes	Written Response	4.8
1716	Independent Report		PD - Wastes	Written Response	4.8
1717	Independent Report		PD - Waste Management	Written Response	4.8
1718	Independent Report		PD - Wastes	Written Response	4.8
1719	Independent Report		PD - Waste Management	Written Response	4.8
1720	Independent Report		PD - Wastes	Written Response	4.8
1721	Independent Report		Unplanned Events	Written Response	5.3
1722	Independent Report		Unplanned Events	Written Response	4.9
1723	Independent Report		Oil Spill Modelling	Written Response	4.9
1724	Independent Report		PD - System Construction	Written Response	4.2
1725	Independent Report		PD - Wastes	Written Response	4.8
1726	Independent Report		Route	Written Response	3
1727	Independent Report		PD - System Construction	Written Response	4.2
1728	Independent Report		Route	Written Response	3
1729	Independent Report		Route	Written Response	3
1730	Independent Report		Route	Written Response	3
1731	Independent Report		Route	Written Response	3
1732	Independent Report		Route	Written Response	3
1733	Independent Report		Route	Written Response	3
1734	Independent Report		Route	Written Response	3
1735	Independent Report		Route	Written Response	3
1736	Independent Report		Route	Written Response	3
1737	Independent Report		Route	Written Response	3
1738	Independent Report		PD - Waste Management	Written Response	4.8
1739	Independent Report		Unplanned Events	Written Response	4.9
1740	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	5.3
1741	Independent Report		PD - Wastes	Written Response	4.8
1742	Independent Report		Project Alternatives	Written Response	3
1743	Independent Report		Unplanned Events	Written Response	5.5
1744	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1745	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1746	Independent Report		Unplanned Events	Written Response	4.9
1747	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1748	Independent Report		Unplanned Events	Written Response	4.9
1749	Independent Report		Unplanned Events	Written Response	4.9
1750	Independent Report		PD - Wastes & Emissions	Written Response	4.5
1751	Independent Report		PD - System Construction	Written Response	4.2
1752	Independent Report		PD - Wastes	Written Response	4.8
1753	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1754	Independent Report		PD - System Construction	Written Response	4.2
1755	Independent Report		PD - Wastes	Written Response	4.8
1756	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1757	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1758	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1759	Independent Report		PD - System Construction	Written Response	4.2
1760	Independent Report		PD - Ops Control & Maintenance	Written Response	8.2
1761	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	5.3
1762	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1763	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1764	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1765	Independent Report		PD - Reinstate & Erosion	Written Response	4.4
1766	Independent Report		PD - Reinstate & Erosion	Written Response	4.4
1767	Independent Report		PD - Reinstate & Erosion	Written Response	4.4
1768	Independent Report		PD - System Construction	Written Response	4.2
1769	Independent Report		PD - System Construction	Written Response	4.2
1770	Independent Report		PD - System Construction	Written Response	4.2
1771	Independent Report		PD - Project Design Basis	Written Response	4.1
1772	Independent Report		PD - Project Design Basis	Written Response	4.1

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1773	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	5.3
1774	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	5.3
1775	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1776	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1777	Independent Report		PD - Project Design Basis	Written Response	4.1
1778	Independent Report		PD - Project Design Basis	Written Response	4.1
1779	Independent Report		PD - Project Design Basis	Written Response	4.1
1780	Independent Report		PD - Project Design Basis	Written Response	4.1
1781	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1782	Independent Report		PD - Project Design Basis	Written Response	4.1
1783	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1784	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1785	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1786	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1787	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1788	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1789	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1790	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1791	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1792	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1793	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1794	Independent Report		PD - System Construction	Written Response	4.2
1795	Independent Report		PD - Project Design Basis	Written Response	4.1
1796	Independent Report		PD - System Construction	Written Response	4.2
1797	Independent Report		PD - System Construction	Written Response	4.2
1798	Independent Report		PD - System Construction	Written Response	4.2
1799	Independent Report		PD - Reinstate & Erosion	Written Response	4.4
1800	Independent Report		PD - Decommissioning	Written Response	4.6
1801	Independent Report		PD - Wastes & Emissions	Written Response	4.5
1802	Independent Report		PD - Project Design Basis	Written Response	5.5
1803	Independent Report		PD - Reinstate & Erosion	Written Response	4.4
1804	Independent Report		PD - Reinstate & Erosion	Written Response	4.4
1805	Independent Report		PD - System Construction	Written Response	4.2
1806	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1807	Independent Report		PD - Ops Control & Maintenance	Written Response	4.5
1808	Independent Report		PD - Outline of Pipeline & Facilities	Written Response	4.2
1809	Independent Report		Unplanned Events	Written Response	4.9
1810	Independent Report		Unplanned Events	Written Response	4.9
1811	Independent Report		Unplanned Events	Written Response	4.9
1812	Independent Report		Unplanned Events	Written Response	4.9
1813	Independent Report		Unplanned Events	Written Response	4.9
1814	Independent Report		Unplanned Events	Written Response	4.9
1815	Independent Report		Air Quality	Written Response	5.3, 5.14
1816	Independent Report		Soil	Written Response	5.7
1817	Independent Report		Noise	Written Response	5.4
1818	Independent Report		water environmental	Written Response	5.8
1819	Independent Report		Noise	Written Response	5.4
1820	Independent Report		Environmental Monitoring	Written Response	8.2
1821	Independent Report		Environmental Monitoring	Written Response	8.2
1822	Independent Report		Oil Spill Modelling	Written Response	4.9
1823	Government and Regulators		PD - Decommissioning	Written Response	4.6
1824	Government and Regulators		PD - Wastes	Written Response	4.8
1825	Government and Regulators		PD - Outline of Pipeline & Facilities	Written Response	4.2
1826	Government and Regulators		PD - System Construction	Written Response	4.2
1827	Government and Regulators		PD - Wastes	Written Response	4.8
1828	Government and Regulators		PD - Wastes	Written Response	4.8

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1829	Government and Regulators		PD - Wastes	Written Response	4.8
1830	Government and Regulators		PD - Wastes	Written Response	4.8
1831	Government and Regulators		Unplanned Events	Written Response	4.9
1832	Government and Regulators		Project Alternatives	Written Response	3
1833	Government and Regulators		Project Alternatives	Written Response	3
1834	Government and Regulators		Project Alternatives	Written Response	3
1835	Government and Regulators		Project Alternatives	Written Response	3
1836	Government and Regulators		Route	Written Response	3
1837	Government and Regulators		Route	Written Response	3
1838	Government and Regulators		Route	Written Response	3
1839	Government and Regulators		Route	Written Response	3
1840	Government and Regulators	ESIA Documentation and Translation	Approach & Methodology	Written Response	6.3
1841	Government and Regulators		Approach & Methodology	Written Response	6.3
1842	Government and Regulators	ESIA Documentation and Translation	Approach & Methodology	Written Response	8.3
1843	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
1844	Government and Regulators		Project Description	Written Response	8.2
1845	Government and Regulators		Environmental Monitoring	Written Response	8.2
1846	Government and Regulators		Cumulative Impacts - Environment	Written Response	5.14
1847	Government and Regulators	Tourism	Legal Compliance (standards) - environment	Written Response	5.14, 6.6
1848	Government and Regulators		Route	Written Response	5.8, 5.14
1849	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
1850	Government and Regulators	Monitoring - Social	Environmental Monitoring	Written Response	8.2, 8.3
1851	Government and Regulators		Environmental Management Plans	Written Response	5.11
1852	Government and Regulators	Land Acquisition and Compensation	PD - Reinstate & Erosion	Written Response	4.4
1853	Government and Regulators	Infrastructure, Transport, Roads	PD - Reinstate & Erosion	Written Response	4.4
1854	Government and Regulators		Environmental Monitoring	Written Response	8.2
1855	Government and Regulators		AGIs - Environment	Written Response	7.2
1856	Government and Regulators		Flora and Fauna	Written Response	5.4
1857	Government and Regulators		PD - Decommissioning	Written Response	4.6
1858	Government and Regulators			Written Response	3
1859	Government and Regulators			Written Response	3
1860	Government and Regulators			Written Response	3
1861	Government and Regulators			Written Response	3
1862	Government and Regulators			Written Response	3
1863	Government and Regulators		Route	Written Response	5.12
1864	Government and Regulators		Flora and Fauna	Written Response	5.11
1865	Government and Regulators		PD - Reinstate & erosion	Written Response	4.4
1866	Government and Regulators		Legal Compliance (standards) - environment	Written Response	4
1867	Government and Regulators	Safety	Approach & Methodology	Written Response	5.5, 8.2, 6.10
1868	Government and Regulators	Health	Legal Compliance (standards) - environment	Written Response	6.10, 8.2

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1869	Government and Regulators		Soil	Written Response	5.6
1870	Government and Regulators	Baseline	water environmental	Written Response	5.5, 6.4
1871	Government and Regulators		Emissions	Written Response	5.3
1872	Government and Regulators		Legal Compliance (standards) - environment	Written Response	5.12
1873	Government and Regulators		Anthrax (?)	Written Response	5.7
1874	Government and Regulators		Project Alternatives	Written Response	3
1875	Government and Regulators		Project Alternatives	Written Response	3
1876	Government and Regulators		Project Alternatives	Written Response	3
1877	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1878	Government and Regulators		Project Alternatives	Written Response	3
1879	Government and Regulators		Construction - Environment	Written Response	8.2
1880	Government and Regulators		Protected Areas	Written Response	5.5, 5.12
1881	Government and Regulators		Erosion	Written Response	4.4
1882	Government and Regulators		Flora	Written Response	5.11
1883	Government and Regulators		Flora and Fauna	Written Response	5.11
1884	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
1885	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1886	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1887	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1888	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1889	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1890	Government and Regulators		water environmental	Written Response	5.8
1891	Government and Regulators		Oil Spill Modelling	Written Response	5.5
1892	Government and Regulators		Oil Spill Mitigation	Written Response	4.9
1893	Government and Regulators		Oil Spill Mitigation	Written Response	4.9
1894	Government and Regulators		Oil Spill Mitigation	Written Response	5.5
1895	Government and Regulators		Oil Spill Mitigation	Written Response	5.5
1896	Government and Regulators		Oil Spill Mitigation	Written Response	5.5
1897	Government and Regulators		Oil Spill Mitigation	Written Response	5.5
1898	Government and Regulators		Oil Spill Mitigation	Written Response	5.5
1899	Government and Regulators		Route	Written Response	3
1900	Government and Regulators		Oil Spill Mitigation	Written Response	5.5, 5.14
1901	Government and Regulators		Hydrogeology	Written Response	5.14
1902	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
1903	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
1904	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1905	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1906	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1907	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1908	Government and Regulators		PD - Project Design Basis	Written Response	4.1

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1909	Government and Regulators		Project Alternatives	Written Response	3
1910	Government and Regulators		Project Alternatives	Written Response	3
1911	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1912	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1913	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1914	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1915	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1916	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1917	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1918	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1919	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1920	Government and Regulators		Project Alternatives	Written Response	3
1921	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1922	Government and Regulators		Project Alternatives	Written Response	3
1923	Government and Regulators		Environmental Monitoring	Written Response	8.2
1924	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
1925	Government and Regulators		Cumulative Impacts - Environment	Written Response	7
1926	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1927	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1928	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
1929	Government and Regulators		Oil Spill Modelling	Written Response	4.9
1930	Government and Regulators		Oil Spill Modelling	Written Response	5.5
1931	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1932	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1933	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
1934	Government and Regulators		Project Alternatives	Written Response	3
1935	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
1936	Government and Regulators		Project Alternatives	Written Response	3
1937	Government and Regulators		Project Alternatives	Written Response	3
1938	Government and Regulators		Project Alternatives	Written Response	3
1939	Government and Regulators		Air Quality	Written Response	5.3
1940	Government and Regulators		Project Alternatives	Written Response	3
1941	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1942	Government and Regulators		Legal Compliance (standards) - environment	Written Response	5.12
1943	Government and Regulators		Route	Written Response	3
1944	Government and Regulators		Protected Areas	Written Response	5.12
1945	Government and Regulators	Macroeconomics	Approach & Methodology	Written Response	6.3
1946	Government and Regulators		Approach & Methodology	Written Response	3
1947	Government and Regulators		Approach & Methodology	Written Response	3
1948	Government and Regulators		Approach & Methodology	Written Response	3

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1949	Government and Regulators		Approach & Methodology	Written Response	3
1950	Government and Regulators		Route	Written Response	5.11
1951	Government and Regulators		Approach & Methodology	Written Response	3
1952	Government and Regulators	Tourism	Legal Compliance (standards) - environment	Written Response	5.11, 7.2, 6.6
1953	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	6.11, 8.2
1954	Government and Regulators		PD - Project Design Basis	Written Response	4.1
1955	Government and Regulators		Approach & Methodology	Written Response	3
1956	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
1957	Government and Regulators		Environmental Management Plans	Written Response	8.2
1958	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
1959	Government and Regulators	Monitoring - Social	Environmental Monitoring	Written Response	8.2, 8.3
1960	Government and Regulators		Environmental Management Plans	Written Response	5.11
1961	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
1962	Government and Regulators	Infrastructure, Transport, Roads	PD - Reinstate & Erosion	Written Response	4.4
1963	Government and Regulators		Approach & Methodology	Written Response	3
1964	Government and Regulators		AGIs - Environment	Written Response	5.11
1965	Government and Regulators		Environmental Monitoring	Written Response	8.2
1966	Government and Regulators		PD - Decommissioning	Written Response	4.6
1967	Government and Regulators		Route	Written Response	5.12
1968	Government and Regulators		Flora and Fauna	Written Response	5.11
1969	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
1970	Government and Regulators		Waste / Waste water	Written Response	8.2
1971	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
1972	Government and Regulators		Climate	Written Response	5.2
1973	Government and Regulators		Climate	Written Response	5.2
1974	Government and Regulators		Climate	Written Response	5.2
1975	Government and Regulators		Climate	Written Response	5.2
1976	Government and Regulators		Climate	Written Response	5.2
1977	Government and Regulators		Climate	Written Response	5.2
1978	Government and Regulators		Air Quality	Written Response	5.3
1979	Government and Regulators		Climate	Written Response	5.2
1980	Government and Regulators		Climate	Written Response	5.2
1981	Government and Regulators		Climate	Written Response	5.2
1982	Government and Regulators		Consultation	Written Response	3
1983	Government and Regulators		Soil	Written Response	5.6
1984	Government and Regulators		water environmental	Written Response	5.8
1985	Government and Regulators		Air quality	Written Response	5.3
1986	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
1987	Government and Regulators		Climate	Written Response	5.2
1988	Government and Regulators		Environmental Monitoring	Written Response	8.2

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1989	Government and Regulators		Protected Areas	Written Response	5.12
1990	Government and Regulators		Seismicity	Written Response	5.5
1991	Government and Regulators		Seismicity	Written Response	5.5
1992	Government and Regulators		Seismicity	Written Response	5.5
1993	Government and Regulators		Seismicity	Written Response	5.5
1994	Government and Regulators		Seismicity	Written Response	5.5
1995	Government and Regulators		Seismicity	Written Response	5.5
1996	Government and Regulators		Seismicity	Written Response	5.5
1997	Government and Regulators		Seismicity	Written Response	5.5
1998	Government and Regulators	Tourism	Archaeology & Cultural Heritage	Written Response	5.1
1998a	NGO		Project Alternatives	Written Response	3
1999	NGO		Route	Written Response	3
2000	NGO		Route	Written Response	3
2001	NGO		Route	Written Response	3
2002	NGO		Route	Written Response	3
2003	NGO		Project Alternatives	Written Response	3
2004	NGO		Project Alternatives	Written Response	3
2005	NGO		PD - Project Design Basis	Written Response	4.1
2006	NGO		PD - Project Design Basis	Written Response	4.1
2007	NGO		Environmental Monitoring	Written Response	8.2
2008	NGO		Environmental Monitoring	Written Response	5.3. 5.11
2009	NGO		Legal Compliance (standards) - environment	Written Response	5.12
2010	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2011	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2012	NGO		PD - System Construction	Written Response	4.2
2013	NGO		Forests	Written Response	8.2
2014	NGO		PD - System Construction	Written Response	4.2
2015	NGO		Environmental Monitoring	Written Response	8.2
2016	NGO		PD - Ops Control & Maintenance	Written Response	4.5
2017	NGO		Flora and Fauna	Written Response	5.11
2018	NGO		PD - Decommissioning	Written Response	4.6
2019	NGO		Flora and Fauna	Written Response	5.11
2020	NGO		PD - Reinstate & Erosion	Written Response	4.4
2021	NGO		PD - Wastes	Written Response	4.8
2022	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2023	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2024	NGO		Legal Compliance (standards) - environment	Written Response	5.12
2025	NGO		Air Quality	Written Response	5.3
2026	NGO		Air Quality	Written Response	5.3
2027	NGO		PD - Wastes & Emissions	Written Response	4.5
2028	NGO		PD - Wastes & Emissions	Written Response	4.5
2029	NGO		PD - Wastes & Emissions	Written Response	4.5
2030	NGO	Safety		Written Response	6.10
2031	NGO	Land Acquisition and Compensation		Written Response	6.7
2032	NGO		Forests	Written Response	5.11
2033	NGO		Forests	Written Response	5.11
2034	NGO		Forests	Written Response	5.11
2035	NGO		Environmental Monitoring	Written Response	8.2
2036	NGO		Environmental Monitoring	Written Response	5.11
2037	NGO		Forests	Written Response	5.11
2038	NGO		Forests	Written Response	5.11
2039	NGO		Forests	Written Response	5.11
2040	NGO		Forests	Written Response	5.11
2041	NGO		Forests	Written Response	5.11
2042	NGO		Flora and Fauna	Written Response	5.11
2043	NGO		Landscape / Visual Impacts	Written Response	5.9
2044	NGO		Soil	Written Response	5.7
2045	NGO		Legal Compliance (standards) - environment	Written Response	5.12
2046	NGO		Legal Compliance (standards) - environment	Written Response	8.2

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2047	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2048	NGO		Forests	Written Response	5.11
2049	NGO		Forests	Written Response	5.11
2050	NGO		Flora and Fauna	Written Response	5.11
2051	NGO		Flora and Fauna	Written Response	5.11
2052	NGO		Noise	Written Response	5.4
2053	NGO		Air Quality	Written Response	5.3
2054	NGO		Forests	Written Response	5.11
2055	NGO		Forests	Written Response	5.11
2056	NGO	Tourism		Written Response	6.6
2057	NGO		PD - Wastes & Emissions	Written Response	4.5
2058	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2059	NGO	Health	Anthrax and Disease	Written Response	5.7, 6.1
2060	NGO	Health	PD - Wastes & Emissions	Written Response	4.5
2061	NGO		Flora and Fauna	Written Response	5.11
2062	NGO		Flora and Fauna	Written Response	5.11
2063	NGO		Noise	Written Response	5.4
2064	NGO		Flora and Fauna	Written Response	5.11
2065	NGO		pd - wastes	Written Response	4.8
2066	NGO		pd - wastes	Written Response	4.8
2067	NGO		PD - Wastes & Emissions	Written Response	4.5
2068	NGO		pd - waste management	Written Response	4.8
2069	NGO		pd - waste management	Written Response	4.8
2070	NGO		Flora and Fauna	Written Response	5.11
2071	NGO		Flora and Fauna	Written Response	5.11
2072	NGO		PD - System Construction	Written Response	4.2
2073	NGO		Flora and Fauna	Written Response	5.11
2074	NGO		Flora and Fauna	Written Response	5.11
2075	NGO		Flora and Fauna	Written Response	5.11
2076	NGO		Flora and Fauna	Written Response	5.11
2077	NGO		Flora and Fauna	Written Response	5.11
2078	NGO		Flora and Fauna	Written Response	5.11
2079	NGO		Flora and Fauna	Written Response	5.11
2080	NGO		Flora and Fauna	Written Response	5.11
2081	NGO		PD - System Construction	Written Response	4.2
2082	NGO		Flora and Fauna	Written Response	5.11
2083	NGO		Flora and Fauna	Written Response	5.11
2084	NGO		Flora and Fauna	Written Response	5.11
2085	NGO		Flora and Fauna	Written Response	5.11
2086	NGO		Flora and Fauna	Written Response	5.11
2087	NGO		Route	Written Response	3
2088	NGO		Hydrogeology / Geomorphology	Written Response	5.5
2089	NGO		Route	Written Response	3
2090	NGO		Flora and Fauna	Written Response	5.11
2091	NGO		Flora and Fauna	Written Response	5.11
2092	NGO		Flora and Fauna	Written Response	5.11
2093	NGO		Flora and Fauna	Written Response	5.11
2094	NGO		Flora and Fauna	Written Response	5.11
2095	NGO		Flora and Fauna	Written Response	5.11
2096	NGO		Route	Written Response	3
2097	NGO		Flora and Fauna	Written Response	5.11
2098	NGO		Flora and Fauna	Written Response	5.11
2099	NGO		Flora and Fauna	Written Response	5.11
2100	NGO		Flora and Fauna	Written Response	5.11
2101	NGO		Flora and Fauna	Written Response	5.11
2102	NGO		Flora and Fauna	Written Response	5.11
2103	NGO		Flora and Fauna	Written Response	5.11
2104	NGO		Flora and Fauna	Written Response	5.11
2105	NGO		Flora and Fauna	Written Response	5.11
2106	NGO		Flora and Fauna	Written Response	5.11
2107	NGO		Flora and Fauna	Written Response	5.11
2108	NGO		Flora and Fauna	Written Response	5.11
2109	NGO		Flora and Fauna	Written Response	5.11
2110	NGO		PD - System Construction	Written Response	4.2
2111	NGO		Flora and Fauna	Written Response	5.11
2112	NGO		Hydrogeology / Geomorphology	Written Response	5.5
2113	NGO		Hydrogeology / Geomorphology	Written Response	5.8
2114	NGO		Hydrogeology / Geomorphology	Written Response	5.5
2115	NGO		Hydrogeology / Geomorphology	Written Response	5.8
2116	NGO		Hydrogeology / Geomorphology	Written Response	5.14
2117	NGO		PD - System Construction	Written Response	4.2
2118	NGO		PD - System Construction	Written Response	4.2
2119	NGO		PD - System Construction	Written Response	4.2

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2120	NGO		PD - System Construction	Written Response	4.2
2121	NGO		Unplanned Events	Written Response	4.9
2122	NGO		Unplanned Events	Written Response	4.9
2123	NGO		PD - Testing & Commissioning	Written Response	4.3
2124	NGO		Unplanned Events	Written Response	4.9
2125	NGO		PD - Ops Control & Maintenance	Written Response	4.5
2126	NGO		Flora and Fauna	Written Response	5.11
2127	NGO		PD - Reinstate & Erosion	Written Response	4.4
2128	NGO		Route	Written Response	3
2129	NGO		PD - Reinstate & Erosion	Written Response	4.4
2130	NGO		PD - Reinstate & Erosion	Written Response	4.4
2131	NGO		PD - Reinstate & Erosion	Written Response	4.4
2132	NGO		Hydrogeology / Geomorphology	Written Response	5.5
2133	NGO		Air Quality	Written Response	5.3
2134	NGO		PD - System Construction	Written Response	4.2
2135	NGO		PD - System Construction	Written Response	4.2
2136	NGO		PD - System Construction	Written Response	4.2
2137	NGO		Unplanned Events	Written Response	4.9
2138	NGO		Legal Compliance (standards) - environment	Written Response	8.2
2139	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2140	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5, 5.8
2141	Government and Regulators		PD - System Construction	Written Response	4.2
2142	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2143	Government and Regulators		Oil Spill Modelling	Written Response	5.14
2144	Government and Regulators	Baseline	PD - System Construction	Written Response	4.2
2145	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
2146	Government and Regulators		Geohazards	Written Response	5.5
2147	Government and Regulators		Construction - Environment	Written Response	4.5
2148	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
2149	Government and Regulators		Route	Written Response	5.5
2150	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
2151	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2152	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2153	Government and Regulators		Seismicity	Written Response	5.5
2154	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2155	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2156	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14
2157	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2158	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2159	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2160	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2161	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2162	Government and Regulators		Seismicity	Written Response	5.5
2163	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.8
2164	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2165	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2166	Government and Regulators		Cumulative Impacts - Environment	Written Response	5.5
2167	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.14

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2168	Government and Regulators		HydroGeology / Geomorphology	Written Response	5.5
2169	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2170	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2171	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2172	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2173	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2174	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2175	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2176	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2177	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
2178	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2179	Government and Regulators		Oil Spill Modelling	Written Response	5.5, 5.14
2180	Government and Regulators		Support for Project	Written Response	4
2181	Government and Regulators		PD - System Construction	Written Response	4.2
2182	Government and Regulators		PD - Testing & Commissioning	Written Response	4.3
2183	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2184	Government and Regulators		Unplanned Events	Written Response	4.9
2185	Government and Regulators		Unplanned Events	Written Response	4.9
2186	Government and Regulators		Project Alternatives	Written Response	3
2187	Government and Regulators		Project Alternatives	Written Response	3
2188	Government and Regulators		PD - System Construction	Written Response	4.2
2189	Government and Regulators		Construction - Environment	Written Response	4.5
2190	Government and Regulators		geohazards	Written Response	5.5
2191	Government and Regulators		Unplanned Events	Written Response	4.9
2192	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2193	Government and Regulators		Unplanned Events	Written Response	5.2
2194	Government and Regulators		geohazards	Written Response	5.2, 5.5
2195	Government and Regulators		water environmental	Written Response	5.14
2196	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2197	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2198	Government and Regulators	Water (social aspects)	Oil Spill Mitigation	Written Response	4.10, 5.5, 5.14, 6.8
2199	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2200	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2201	Government and Regulators		Waste / Waste Water	Written Response	4.8
2202	Government and Regulators		Flora and Fauna	Written Response	5.11
2203	Government and Regulators		Waste / Waste Water	Written Response	5.8
2204	Government and Regulators		Air Quality	Written Response	5.3
2205	Government and Regulators		Oil Spill Mitigation	Written Response	4.1, 8.2
2206	Government and Regulators		Consultation	Written Response	3
2207	Government and Regulators		Anthrax and Disease	Written Response	5.7, 8.2

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2208	Government and Regulators		water environmental	Written Response	5.8
2209	Government and Regulators		Noise	Written Response	5.4
2210	Government and Regulators		Flora and Fauna	Written Response	8.2
2211	Government and Regulators		Flora and Fauna	Written Response	5.11
2212	Government and Regulators		Flora and Fauna	Written Response	5.11
2213	Government and Regulators		water environmental	Written Response	5.14
2214	Government and Regulators	Reinstatement	Forests	Written Response	5.11, 6.7
2215	Government and Regulators		Soil	Written Response	5.6, 6.7
2216	Government and Regulators	Reinstatement	Environmental Investment Programme	Written Response	8.2, 6.7
2217	Government and Regulators	Community Investment Programme	Waste / Waste Water	Written Response	8.2, 6.13
2218	Government and Regulators	Community Investment Programme	Waste / Waste Water	Written Response	8.2, 6.13
2219	Government and Regulators		Environmental Monitoring	Written Response	5.7
2220	Government and Regulators		Anthrax and Disease	Written Response	5.7
2221	Government and Regulators		Waste / Waste Water	Written Response	4.8
2222	Government and Regulators		Waste / Waste Water	Written Response	4.8
2223	Government and Regulators		Waste / Waste Water	Written Response	5.7
2224	Government and Regulators		Waste / Waste Water	Written Response	5.7, 5.14
2225	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2226	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2227	Government and Regulators		Project Alternatives	Written Response	3
2228	Government and Regulators		Project Alternatives	Written Response	3
2229	Government and Regulators		Emissions	Written Response	5.3
2230	Government and Regulators		Project Alternatives	Written Response	3
2231	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2232	Government and Regulators		Seismicity	Written Response	5.5
2233	Government and Regulators		Seismicity	Written Response	5.5
2234	Government and Regulators		Seismicity	Written Response	5.5
2235	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.10
2236	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.10
2237	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.10
2238	Government and Regulators	Community Investment Programme	Archaeology & Cultural Heritage	Written Response	5.10, 6.13
2239	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.10
2240	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.10
2241	Government and Regulators		Climate	Written Response	5.2
2242	Government and Regulators		Surface Water (rivers and lakes)	Written Response	5.8
2243	Government and Regulators		Surface Water (rivers and lakes)	Written Response	5.8
2244	Government and Regulators		Geohazards	Written Response	5.5
2245	Government and Regulators		Geohazards	Written Response	5.5
2246	Government and Regulators		Geohazards	Written Response	5.5
2247	Government and Regulators		Surface Water (rivers and lakes)	Written Response	5.8

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2248	Government and Regulators		Geohazards	Written Response	5.5
2249	Government and Regulators		Environmental Monitoring	Written Response	8.2
2250	Government and Regulators		Environmental Monitoring	Written Response	8.2
2251	Government and Regulators		Soil	Written Response	5.7
2252	Government and Regulators		water environmental	Written Response	5.8
2253	Government and Regulators		Air Quality	Written Response	5.3
2254	Government and Regulators		Unplanned Events	Written Response	4.9
2255	Government and Regulators		Emissions / Dust	Written Response	5.3
2256	Government and Regulators		Oil Spill Modelling	Written Response	5.11, 5.14
2257	Government and Regulators		Oil Spill Modelling	Written Response	5.14
2258	Government and Regulators		Oil Spill Modelling	Written Response	5.14
2259	Government and Regulators		Air Quality	Written Response	5.3
2260	Government and Regulators		Oil Spill Modelling	Written Response	5.5
2261	Government and Regulators		Unplanned events	Written Response	4.9
2262	Government and Regulators		Project Alternatives	Written Response	3
2263	Government and Regulators		Approach & Methodology	Written Response	3
2264	Government and Regulators		Seismicity	Written Response	5.5
2265	Government and Regulators		Waste / Waste Water	Written Response	4.8
2266	Government and Regulators		Waste / Waste Water	Written Response	4.8
2267	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2268	Government and Regulators		PD - Outline of Pipeline & Facilities	Written Response	4.2
2269	Government and Regulators		Noise	Written Response	5.4
2270	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2271	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2272	Government and Regulators		Waste / Waste Water	Written Response	4.8
2273	Government and Regulators		Emissions / Dust	Written Response	4.2
2274	Government and Regulators		Noise	Written Response	5.4
2275	Government and Regulators		Cumulative Impacts - environment	Written Response	7.2
2276	Government and Regulators		Emissions / Dust	Written Response	5.12
2277	Government and Regulators		Noise	Written Response	5.4
2278	Government and Regulators		Oil Spill Mitigation	Written Response	4.9
2279	Government and Regulators		Noise	Written Response	5.4
2280	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2281	Government and Regulators		Seismicity	Written Response	5.5
2282	Government and Regulators		Seismicity	Written Response	5.5
2283	Government and Regulators		Noise	Written Response	5.4
2284	Government and Regulators		Surface Water (rivers and lakes)	Written Response	5.8
2285	Government and Regulators		Environmental Monitoring	Written Response	5.8
2286	Government and Regulators	Baseline	water environmental	Written Response	5.8, 6.4
2287	Government and Regulators		water environmental	Written Response	5.8

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2288	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
2289	Government and Regulators		Construction - Environment	Written Response	4.5
2290	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
2291	Government and Regulators		water environmental	Written Response	5.14
2292	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.14
2293	Government and Regulators		Project Description	Written Response	4
2294	Government and Regulators		Geohazards	Written Response	5.5
2295	Government and Regulators		Forests	Written Response	5.11
2296	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2297	Government and Regulators		Project Description	Written Response	8.2
2298	Government and Regulators		Project Description	Written Response	7.2
2299	Government and Regulators		Oil Spill Modelling	Written Response	5.14
2300	Government and Regulators		Oil Spill Modelling	Written Response	5.8, 5.14
2301	Government and Regulators		Surface Water (rivers and lakes)	Written Response	5.8
2302	Government and Regulators		Unplanned events	Written Response	4.9
2303	Government and Regulators		Oil Spill Modelling	Written Response	4.1
2304	Government and Regulators		Cumulative Impacts - environment	Written Response	7
2305	Government and Regulators		Environmental Management Plans	Written Response	8.2
2306	Government and Regulators		Environmental Management Plans	Written Response	8.2
2307	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2308	Government and Regulators		Environmental Monitoring	Written Response	8.2
2309	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2310	Government and Regulators		Environmental Monitoring	Written Response	8.2
2311	Government and Regulators		PD - Project Design Basis	Written Response	4.1
2312	Government and Regulators		Cumulative Impacts - environment	Written Response	7.2
2313	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
2314	Government and Regulators		Environmental Management Plans	Written Response	8.2
2315	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
2316	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2317	Government and Regulators		Construction - Environment	Written Response	8.2
2318	Government and Regulators		Legal Compliance (standards) - environment	Written Response	4
2319	Government and Regulators		Project Description	Written Response	5.8
2320	Government and Regulators		Emissions / Dust	Written Response	8.2
2321	Government and Regulators		Environmental Management Plans	Written Response	8.2
2322	Government and Regulators		Waste / Waste Water	Written Response	4.8
2323	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
2324	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
2325	Government and Regulators		Environmental Management Plans	Written Response	8.2
2326	Government and Regulators		Approach & Methodology	Written Response	3
2327	Government and Regulators		Protected Areas	Written Response	5.12

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2328	Government and Regulators		Project Description	Written Response	5.12
2329	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	5.12, 6.11
2330	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	8.2, 6.11
2331	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	8.2, 6.11
2332	Government and Regulators		Climate	Written Response	5.2
2333	Government and Regulators		Project Description	Written Response	5.2, 5.7
2334	Government and Regulators		Unplanned events	Written Response	4.9
2335	Government and Regulators		Climate	Written Response	5.2
2336	Government and Regulators		Environmental Management Plans	Written Response	8
2337	Government and Regulators		Legal Compliance (standards) - environment	Written Response	8.2
2338	Government and Regulators	International Standards and Legal Compliance (social)	Legal Compliance (standards) - environment	Written Response	6.11
2339	Government and Regulators		Project Description	Written Response	4
2340	Government and Regulators		Climate	Written Response	5.2
2341	Government and Regulators		Legal Compliance (standards) - environment	Written Response	4
2342	Government and Regulators		Project Description	Written Response	4
2343	Government and Regulators		Cumulative Impacts - environment	Written Response	7.2
2344	Government and Regulators		Project Description	Written Response	5.9
2345	Government and Regulators		Climate	Written Response	5.2
2346	Government and Regulators		Climate	Written Response	5.2
2347	Government and Regulators		Erosion	Written Response	4.4
2348	Government and Regulators		Project Description	Written Response	5.9
2349	Government and Regulators		Oil Spill Modelling	Written Response	5.6
2350	Government and Regulators		Cumulative Impacts - environment	Written Response	5.9, 7.2
2351	Government and Regulators		Project Alternatives	Written Response	3
2352	Government and Regulators		Climate	Written Response	5.2
2353	Government and Regulators		Soil	Written Response	5.6
2354	Government and Regulators		PD - Decommissioning	Written Response	4.6
2355	Government and Regulators		PD - Decommissioning	Written Response	4.6
2356	Government and Regulators		Soil	Written Response	5.6
2357	Government and Regulators		Soil	Written Response	5.6
2358	Government and Regulators		Approach and Methodology	Written Response	5.6
2359	Government and Regulators		Approach and Methodology	Written Response	5.6
2360	Government and Regulators		Geohazards	Written Response	5.5
2361	Government and Regulators		Geohazards	Written Response	5.5
2362	Government and Regulators		Project Alternatives	Written Response	3
2363	Government and Regulators		Geohazards	Written Response	5.5
2364	Government and Regulators		Geohazards	Written Response	5.5
2365	Government and Regulators		Geohazards	Written Response	5.5
2366	Government and Regulators		Geohazards	Written Response	5.5
2367	Government and Regulators		Erosion	Written Response	4.4

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2368	Government and Regulators		Geohazards	Written Response	5.5
2369	Government and Regulators		Erosion	Written Response	4.4
2370	Government and Regulators	Consultation	Consultation	Written Response	6.9
2371	Government and Regulators		Geohazards	Written Response	5.5
2372	Government and Regulators		Geohazards	Written Response	5.5
2373	Government and Regulators		Erosion	Written Response	5.5
2374	Government and Regulators		Geohazards	Written Response	5.5
2375	Government and Regulators		Geohazards	Written Response	5.5
2376	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
2377	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
2378	Government and Regulators		Project Description	Written Response	4
2379	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
2380	Government and Regulators		Geohazards	Written Response	5.8
2381	Government and Regulators		Erosion	Written Response	4.4
2382	Government and Regulators		Soil	Written Response	5.6
2383	Government and Regulators		Construction - Environment	Written Response	4.5
2384	Government and Regulators		Consultation	Written Response	4.5
2385	Government and Regulators		Geohazards	Written Response	5.2, 5.8
2386	Government and Regulators		Environmental Monitoring	Written Response	8.2
2387	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
2388	Government and Regulators	Community Investment Programme	Environmental Investment Programme	Written Response	5.8, 6.13
2389	Government and Regulators		Unplanned events	Written Response	5.8
2390	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
2391	Government and Regulators		Construction - Environment	Written Response	4.5
2392	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2393	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
2394	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
2395	Government and Regulators		Environmental Monitoring	Written Response	8
2396	Government and Regulators		Construction - Environment	Written Response	4.5
2397	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
2398	Government and Regulators		Environmental Monitoring	Written Response	8
2399	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
2400	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2401	Government and Regulators		Oil Spill Mitigation	Written Response	5.5
2402	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2403	Government and Regulators		Construction - Environment	Written Response	4.5
2404	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2405	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2406	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2407	Government and Regulators		Oil Spill Mitigation	Written Response	5.14

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2408	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2409	Government and Regulators	Water (social aspects)	Oil Spill Mitigation	Written Response	5.14, 6.8
2410	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2411	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2412	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2413	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2414	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
2415	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
2416	Government and Regulators	Water (social aspects)	Hydrogeology / Geomorphology	Written Response	5.8, 5.14, 6.8
2417	Government and Regulators		Legal compliance (standards) - environment	Written Response	5.12
2418	Government and Regulators		Construction - Environment	Written Response	8.2
2419	Government and Regulators		Hydrogeology / Geomorphology	Written Response	8.2
2420	Government and Regulators		Support for Project	Written Response	4
2421	Government and Regulators		Flora and Fauna	Written Response	5.11
2422	Government and Regulators		Flora and Fauna	Written Response	5.11
2423	Government and Regulators		Flora and Fauna	Written Response	5.11
2424	Government and Regulators		Flora and Fauna	Written Response	5.11
2425	Government and Regulators		Flora and Fauna	Written Response	5.11
2426	Government and Regulators		Flora and Fauna	Written Response	5.11
2427	Government and Regulators		erosion	Written Response	4.4
2428	Government and Regulators		Flora and Fauna	Written Response	5.11
2429	Government and Regulators		Flora and Fauna	Written Response	8.2
2430	Government and Regulators		Flora and Fauna	Written Response	5.11
2431	Government and Regulators		Construction - Environment	Written Response	4.5
2432	Government and Regulators		Construction - Environment	Written Response	4.5
2433	Government and Regulators		Flora and Fauna	Written Response	5.11
2434	Government and Regulators		Flora and Fauna	Written Response	5.11
2435	Government and Regulators		Flora and Fauna	Written Response	5.11
2436	Government and Regulators		Flora and Fauna	Written Response	5.11
2437	Government and Regulators		Landscape / Visual Impacts	Written Response	5.9
2438	Government and Regulators		Flora and Fauna	Written Response	5.11, 5.14
2439	Other Organisation		route	Written Response	3
2440	Other Organisation		route	Written Response	3
2441	Other Organisation		water environmental	Written Response	5.5
2442	Other Organisation		Construction - Environment	Written Response	5.11, 5.14
2443	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.5
2444	Other Organisation		Soil	Written Response	5.6
2445	Other Organisation		geohazards	Written Response	5.5
2446	Other Organisation		geohazards	Written Response	5.5
2447	Other Organisation		erosion	Written Response	5.5
2448	Other Organisation		water environmental	Written Response	5.5, 5.8
2449	Other Organisation		water environmental	Written Response	5.5, 5.6, 5.8
2450	Other Organisation		oil spill modelling	Written Response	5.5, 5.14
2451	Other Organisation		waste	Written Response	4.8
2452	Other Organisation		Flora and Fauna	Written Response	5.11
2453	Other Organisation		forests	Written Response	8.2, 5.11
2454	Other Organisation		Flora and Fauna	Written Response	5.11
2455	Other Organisation		forests	Written Response	5.11

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2456	Other Organisation		Flora and Fauna	Written Response	5.9, 5.11
2457	Other Organisation		water environmental	Written Response	5.8
2458	Other Organisation		climate	Written Response	5.2
2459	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8, 5.14
2460	Other Organisation		legal compliance (standards) - environment	Written Response	5.12
2461	Other Organisation		oil spill modelling	Written Response	5.5, 5.14
2462	Other Organisation		route	Written Response	3
2463	Other Organisation		cumulative impacts - environment	Written Response	5.5
2464	Other Organisation		unplanned events	Written Response	4.9
2465	Other Organisation		cumulative impacts - environment	Written Response	7.2
2466	Other Organisation		seismicity	Written Response	5.5
2467	Other Organisation		water environmental	Written Response	5.8
2468	Other Organisation		Oil Spill Mitigation	Written Response	5.14
2469	Other Organisation		geohazards	Written Response	5.5
2470	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.5, 5.8
2471	Other Organisation		Project Description	Written Response	4
2472	Other Organisation		Project Description	Written Response	4
2473	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2474	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2475	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2476	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2477	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2478	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2479	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2480	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2481	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2482	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2483	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2484	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2485	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2486	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2487	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2488	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2489	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2490	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2491	Other Organisation		Support for Project	Written Response	5.1
2492	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2493	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2494	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2495	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2496	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2497	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2498	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2499	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2500	Other Organisation	Employment		Written Response	6.6
2501	Other Organisation	Employment		Written Response	6.6
2502	Other Organisation	Employment		Written Response	6.6
2503	Other Organisation	Employment		Written Response	6.6
2504	Other Organisation	Land Acquisition and Compensation		Written Response	6.7

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2505	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2506	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2507	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2508	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2509	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2510	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2511	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2512	Other Organisation	Infrastructure, Transport, Roads		Written Response	6.8
2513	Other Organisation	Access to Energy		Written Response	6.8
2514	Other Organisation		Waste / Waste Water	Written Response	4.8
2515	Other Organisation		PD - System Construction	Written Response	4.2
2516	Other Organisation	Health		Written Response	6.13
2517	Other Organisation	Land Acquisition and Compensation		Written Response	
2518	Other Organisation	Demography and Ethnicity		Written Response	6.9
2519	Other Organisation	Security		Written Response	6.10, 6.14
2520	Other Organisation	Community Investment Programme		Written Response	6.13
2521	Other Organisation	Cumulative and Residual Impacts		Written Response	6.12, 6.14
2522	Other Organisation	Cumulative and Residual Impacts		Written Response	6.12
2523	Other Organisation	Safety		Written Response	6.8, 6.10
2524	Other Organisation	Employment		Written Response	6.6
2525	Other Organisation	Consultation		Written Response	6.9
2526	Other Organisation	Data Collection		Written Response	6.3
2527	Other Organisation	Baseline		Written Response	6.3
2528	Other Organisation	Consultation		Written Response	6.9
2529	Other Organisation	Demography and Ethnicity		Written Response	6.3
2530	Other Organisation	Employment		Written Response	6.6
2531	Other Organisation	Employment		Written Response	6.6
2532	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2533	Other Organisation		Waste / Waste Water	Written Response	4.8
2534	Other Organisation	Consultation		Written Response	6.9
2535	Other Organisation	Consultation		Written Response	6.9
2536	Other Organisation	Employment		Written Response	6.6
2537	Other Organisation	Health		Written Response	6.13
2538	Other Organisation	Community Investment Programme		Written Response	6.13
2539	Other Organisation	Monitoring - Social		Written Response	8.3
2540	Other Organisation	Consultation		Written Response	6.9
2541	Government and Regulators	Consultation		Written Response	6.9
2542	Government and Regulators	Consultation		Written Response	6.3
2543	Government and Regulators	Consultation		Written Response	6.3
2544	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
2545	Government and Regulators	Cumulative and Residual Impacts		Written Response	6.12
2546	Government and Regulators	Employment		Written Response	6.6
2547	Government and Regulators		Archaeology & Cultural Heritage	Written Response	5.1
2548	Government and Regulators	Unplanned events		Written Response	6.10
2549	Government and Regulators	Tourism		Written Response	6.6
2550	Government and Regulators	Water (social aspects)		Written Response	6.8
2551	Government and Regulators	Water (social aspects)		Written Response	6.8
2552	Government and Regulators	Water (social aspects)		Written Response	6.8
2553	Government and Regulators	Water (social aspects)		Written Response	6.8
2554	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.14
2555	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.9

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2556	Government and Regulators		PD - Project Schedule	Written Response	4.2
2557	Government and Regulators	Consultation		Written Response	6.9
2558	Government and Regulators	Consultation		Written Response	6.3
2559	Government and Regulators	Consultation		Written Response	6.3
2560	Government and Regulators	Water (social aspects)		Written Response	6.8
2561	Government and Regulators		PD - Outline of Pipeline & Facilities	Written Response	4.2
2562	Government and Regulators	Land Use Restrictions		Written Response	6.7
2563	Government and Regulators	Land Acquisition and Compensation		Written Response	6.7
2564	Government and Regulators	Security		Written Response	6.10
2565	Private Individual	Employment		Feedback Form	6.6
2566	Private Individual	Tariffs		Feedback Form	6.2
2567	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2568	Private Individual	Access to Energy		Feedback Form	6.5
2569	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2570	Private Individual	Access to Energy		Feedback Form	6.5
2571	Private Individual	Water (social aspects)		Feedback Form	6.13
2572	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2573	Private Individual	Access to Energy		Feedback Form	6.5
2574	Private Individual	Other Compensation		Feedback Form	6.13
2575	Private Individual	Community Investment Programme		Feedback Form	6.13
2576	Private Individual	Access to Energy		Feedback Form	6.5
2577	Private Individual	Other Compensation		Feedback Form	6.13
2578	Private Individual	Employment		Feedback Form	6.6
2579	Private Individual	Employment		Feedback Form	6.9
2580	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2581	Private Individual		PD - Reinstate & Erosion	Feedback Form	4.4
2582	Private Individual	Employment		Feedback Form	6.6
2583	Private Individual	Community Investment Programme		Feedback Form	6.13
2584	Private Individual	General Construction Queries		Feedback Form	6.9
2585	Private Individual	Support for Project		Feedback Form	6.2
2586	Private Individual	Community Investment Programme		Feedback Form	6.13
2587	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2588	Private Individual	Employment		Feedback Form	6.6
2589	Private Individual	Land Use Restrictions		Feedback Form	6.7
2590	Private Individual		Oil spill modelling	Feedback Form	5.5, 5.14
2591	Private Individual	Employment		Feedback Form	6.6
2592	Private Individual	Access to Energy		Feedback Form	6.5
2593	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2594	Private Individual	Community Relations		Feedback Form	6.9
2595	Private Individual	Support for Project		Feedback Form	6.2
2596	Private Individual	Security		Feedback Form	6.10
2597	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2598	Private Individual	Support for Project		Feedback Form	6.2
2599	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2600	NGO	Tourism		NGO Workshop	6.6
2601	NGO	Consultation		NGO Workshop	6.9
2602	Government and Regulators		Environmental Management Plans	Written Response	8.2
2603	Government and Regulators		Environmental Management Plans	Written Response	8.2
2604	Government and Regulators	Employment	Geohazards	Written Response	5.5, 6.6
2605	Government and Regulators	Consultation		Written Response	6.9
2606	Government and Regulators	ESIA Documentation and Translation		Written Response	6.9
2607	Government and Regulators		Geohazards	Written Response	5.5
2608	Government and Regulators	Employment		Written Response	6.6

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2609	Other Organisation	Water (social aspects)	water environmental	Written Response	5,8 6.8
2610	Other Organisation	Water (social aspects)	water environmental	Written Response	5,8 6.8
2611	Other Organisation	Infrastructure, Transport, Roads		Written Response	6.8
2612	Other Organisation	Infrastructure, Transport, Roads	Noise	Written Response	5.4, 6.8
2613	Other Organisation	Water (social aspects)	Cumulative impacts - environment	Written Response	5.8, 5.11, 6.8
2614	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.14
2615	Other Organisation		water environmental	Written Response	5.14
2616	Other Organisation		water environmental	Written Response	5.14
2617	Other Organisation	Water (social aspects)	water environmental	Written Response	5.8, 6.8
2618	Other Organisation		Anthrax and Disease	Written Response	5.7
2619	Other Organisation		Anthrax	Written Response	5.7, 8.2
2620	Other Organisation	Water (social aspects)	water environmental	Written Response	5.14, 6.8
2621	Other Organisation	Water (social aspects)	water environmental	Written Response	5.8, 6.8
2622	Other Organisation		water environmental	Written Response	5.14
2623	Other Organisation	Baseline		Written Response	6.4
2624	Other Organisation	Baseline		Written Response	6.4, 6.3
2625	Other Organisation	Macroeconomics		Written Response	6.3
2626	Other Organisation	Baseline		Written Response	6.4
2627	Other Organisation	Health	Waste / Waste Water	Written Response	6.10
2628	Other Organisation	Baseline		Written Response	6.4
2629	Other Organisation	Health		Written Response	6.4
2630	Other Organisation	Employment		Written Response	6.4
2631	Other Organisation	Data Collection		Written Response	6.4
2632	Other Organisation	Baseline		Written Response	6.4
2633	Other Organisation	Livelihoods		Written Response	6.4
2634	Other Organisation	Baseline		Written Response	6.4
2635	Other Organisation	ESIA Documentation and Translation		Written Response	6.4
2636	Other Organisation	ESIA Documentation and Translation		Written Response	6.3
2637	Other Organisation	Macroeconomics		Written Response	6.3
2638	Other Organisation	Employment		Written Response	6.6
2639	Other Organisation	Employment		Written Response	6.6
2640	Other Organisation	Employment		Written Response	6.6
2641	Other Organisation	Employment		Written Response	6.6
2642	Other Organisation	Employment		Written Response	6.6
2643	Other Organisation	Employment		Written Response	6.6
2644	Other Organisation	Employment		Written Response	6.6
2645	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2646	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2647	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2648	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2649	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2650	NGO		Route	Written Response	3
2651	NGO		Approach and Methodology	Written Response	3
2652	NGO	Borjomi	water environmental	Written Response	5.14
2653	NGO	Monitoring - Social		Written Response	8.3
2654	NGO		Project Description	Written Response	4
2655	NGO		Project Description	Written Response	4
2656	NGO	Health		Written Response	6.10
2657	NGO	Baseline	water environmental	Written Response	5.8, 6.4
2658	NGO	Baseline	water environmental	Written Response	5.8, 6.4
2659	NGO		Waste / Waste Water	Written Response	5.8
2660	NGO		PD - System Construction	Written Response	4.2
2661	NGO		Anthrax	Written Response	5.7, 8.2
2662	NGO	Consultation		Written Response	6.9
2663	NGO	Consultation		Written Response	6.9
2664	NGO	Consultation		Written Response	6.9
2665	NGO	Consultation		Written Response	6.9
2666	NGO	Consultation		Written Response	6.9
2667	NGO	Consultation		Written Response	6.9
2668	NGO	Consultation		Written Response	6.9
2669	NGO	Consultation		Written Response	6.9
2670	NGO	Consultation		Written Response	6.9
2671	NGO	Consultation		Written Response	6.9
2672	NGO	Consultation		Written Response	6.9
2673	NGO	Land Acquisition and Compensation		Written Response	6.7
2674	NGO	Employment		Written Response	6.6
2675	NGO	Community Investment Programme		Written Response	6.13

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
2676	NGO	ESIA Documentation and Translation		Written Response	6.3
2677	Private Individual	Community Investment Programme		Written Response	6.13
2678	NGO	Support for Project		Written Response	6.2
2679	NGO	Safety		Written Response	6.10
2680	NGO	Safety		Written Response	6.10
2681	NGO	Health		Written Response	6.10
2682	NGO	Safety		Written Response	6.10
2683	Private Individual		Project Description	Written Response	4
2684	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2685	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2686	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2687	Other Organisation	Infrastructure, Transport, Roads	Project Description	Written Response	6.8
2688	Other Organisation	Access to Energy		Written Response	6.8
2689	Other Organisation		Waste / Waste Water	Written Response	4.8
2690	Other Organisation		PD - System Construction	Written Response	4.2
2691	Other Organisation	Health		Written Response	6.13
2692	Other Organisation	ESIA Documentation and Translation		Written Response	
2693	Other Organisation	Demography and Ethnicity		Written Response	6.9
2694	Other Organisation	Security		Written Response	6.10
2695	Other Organisation	Community Investment Programme		Written Response	6.13
2696	Other Organisation	Cumulative and Residual Impacts	Cumulative impacts - environment	Written Response	6.12, 7.2
2697	Other Organisation	Cumulative and Residual Impacts	Cumulative impacts - environment	Written Response	6.12, 7.2
2698	Other Organisation	Safety		Written Response	6.8, 6.10
2699	Other Organisation	Employment		Written Response	6.6
2700	Other Organisation	Community Relations		Written Response	6.9
2701	Other Organisation	Baseline		Written Response	6.3
2702	Other Organisation	Baseline		Written Response	6.3
2703	Other Organisation	Community Relations		Written Response	6.9
2704	Other Organisation	Baseline		Written Response	6.4
2705	Other Organisation	Employment		Written Response	6.6
2706	Other Organisation	Employment		Written Response	6.6
2707	Other Organisation	Land Acquisition and Compensation		Written Response	6.7
2708	Other Organisation		Waste / Waste Water	Written Response	4.8
2709	Other Organisation	Community Relations		Written Response	6.9
2710	Other Organisation	Community Relations		Written Response	6.9
2711	Other Organisation	Employment		Written Response	6.6
2712	Other Organisation	Health		Written Response	6.13
2713	Other Organisation	Community Investment Programme		Written Response	6.13
2714	Other Organisation	Cumulative and Residual Impacts		Written Response	6.12
2715	Other Organisation	Community Relations		Written Response	6.9
2716	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.10, 5.12
2717	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2718	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2719	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2720	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2721	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2722	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2723	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2724	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2725	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2726	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2727	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2728	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2729	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
2730	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2731	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2732	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2733	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2734	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2735	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2736	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.10, 5.12
2737	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2738	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2739	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2740	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2741	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2742	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2743	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2744	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2745	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2746	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2747	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2748	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2749	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2750	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2751	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2752	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.10, 5.12
2753	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2754	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.12
2755	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.12
2756	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2757	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2758	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2759	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2760	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2761	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2762	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2763	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2764	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2765	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2766	Other Organisation		Archaeology & Cultural Heritage	Written Response	7.2
2767	Other Organisation		Archaeology & Cultural Heritage	Written Response	8.2
2768	Other Organisation		Archaeology & Cultural Heritage	Written Response	8.2
2769	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
2770	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.10, 8.2
2771	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.10, 8.2
2772	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.10, 8.2
2773	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2774	Other Organisation		Archaeology & Cultural Heritage	Written Response	5.1
2775	Private Individual	Access to Energy		Written Response	6.5
2776	Private Individual	Community Investment Programme		Written Response	6.13
2777	Private Individual	Community Investment Programme		Written Response	6.13
2778	NGO	Baseline		Written Response	6.9
2779	NGO	Consultation		Written Response	6.9
2780	NGO	Baseline		Written Response	5.14, 6.4
2781	NGO	Data collection		Written Response	6.9
2782	NGO	Access to Energy		Written Response	6.5
2783	NGO	Previous construction experience		Written Response	6.9
2784	NGO	Previous construction experience		Written Response	6.9
2785	NGO	Previous construction experience		Written Response	6.9
2786	NGO	Previous construction experience		Written Response	6.9
2787	NGO	Land Acquisition and Compensation		Written Response	6.7
2788	NGO	Government Relations		Written Response	6.9
2789	NGO	Community Investment Programme		Written Response	6.13
2790	NGO	Government Relations		Written Response	6.7
2791	NGO	Consultation		Written Response	6.9
2792	NGO	Land Acquisition and Compensation		Written Response	6.7
2793	NGO	Government Relations		Written Response	6.9
2794	NGO	Government Relations		Written Response	6.13
2795	NGO	Land Acquisition and Compensation		Written Response	6.7
2796	NGO	Government Relations		Written Response	6.9, 6.3
2797	NGO	Consultation		Written Response	6.9
2798	NGO	Other Compensation		Written Response	6.7, 6.9
2799	NGO	Previous construction experience		Written Response	6.9
2800	NGO	Previous construction experience		Written Response	6.9
2801	NGO	Previous construction experience		Written Response	6.9
2802	NGO	Previous construction experience		Written Response	6.9
2803	NGO	Previous construction experience		Written Response	6.9
2804	NGO	Previous construction experience		Written Response	6.9
2805	NGO	Consultation		Written Response	6.9
2806	NGO	Consultation		Written Response	6.9
2807	NGO	Consultation		Written Response	6.9
2808	NGO	Consultation		Written Response	6.9
2809	NGO	Data collection		Written Response	6.3
2810	NGO	Data collection		Written Response	6.3
2811	NGO	Community Investment Programme		Written Response	6.9
2812	NGO	Access to Energy		Written Response	6.5
2813	NGO	Previous construction experience		Written Response	6.9
2814	NGO	Previous construction experience		Written Response	6.9
2815	NGO	Employment		Written Response	6.6
2816	NGO	Previous construction experience		Written Response	6.9
2817	NGO	Land Acquisition and Compensation		Written Response	6.7
2818	NGO	Land Acquisition and Compensation		Written Response	6.7
2819	NGO	Land Acquisition and Compensation		Written Response	6.7
2820	NGO	Safety	Cumulative impacts - environment	Written Response	6.10, 7.2
2821	NGO	Consultation		Written Response	6.9

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
2822	NGO	Issues around Borjomi		Written Response	5.14
2823	NGO	ESIA Documentation and Translation		Written Response	6.9
2824	NGO	Consultation		Written Response	6.9
2825	NGO	Consultation		Written Response	6.9
2826	NGO	Consultation		Written Response	6.9
2827	NGO	Consultation		Written Response	6.9
2828	NGO	Consultation		Written Response	6.9
2829	NGO	Consultation		Written Response	6.9
2830	NGO	Consultation		Written Response	6.9
2831	NGO	Consultation		Written Response	6.9
2832	NGO	Consultation		Written Response	6.9
2833	NGO	Land Acquisition and Compensation		Written Response	6.7
2834	NGO	Consultation		Written Response	6.9
2835	NGO	ESIA Documentation and Translation		Written Response	6.9
2836	NGO	Consultation		Written Response	6.9
2837	NGO	Consultation		Written Response	6.9
2838	NGO	Data collection		Written Response	6.3
2839	NGO	Consultation		Written Response	6.9
2840	NGO	Consultation		Written Response	6.9
2841	NGO	Consultation		Written Response	6.9
2842	NGO	Consultation		Written Response	6.3
2843	NGO	Consultation		Written Response	6.9
2844	NGO	Consultation		Written Response	6.9
2845	NGO	Consultation		Written Response	6.9
2846	NGO	Consultation		Written Response	6.9
2847	NGO	Consultation		Written Response	6.9
2848	NGO	Data collection		Written Response	6.3
2849	NGO	Data collection		Written Response	6.3
2850	NGO	Employment		Written Response	6.6
2851	NGO	Access to Energy		Written Response	6.5
2852	NGO	Community Investment Programme		Written Response	6.13
2853	NGO	Access to Energy		Written Response	6.5
2854	NGO	Access to Energy		Written Response	6.5
2855	NGO	Access to Energy		Written Response	6.5
2856	NGO	Access to Energy		Written Response	6.5
2857	NGO	Community Investment Programme		Written Response	6.13
2858	NGO	Community Investment Programme		Written Response	6.13
2859	NGO	Water (social aspects)		Written Response	6.8
2860	NGO	Employment		Written Response	6.9
2861	NGO	Employment		Written Response	6.9
2862	NGO	Employment		Written Response	6.6
2863	NGO	Employment		Written Response	6.6
2864	NGO	Employment		Written Response	6.6
2865	NGO	Employment		Written Response	6.9
2866	NGO	Land Acquisition and Compensation		Written Response	6.7
2867	NGO	Land Acquisition and Compensation		Written Response	6.7
2868	NGO	Land Acquisition and Compensation		Written Response	6.7
2869	NGO	Land Acquisition and Compensation		Written Response	6.7
2870	NGO	Land Acquisition and Compensation		Written Response	6.7
2871	NGO	Reinstatement	Oil Spill Mitigation	Written Response	5.14, 6.7, 6.7
2872	NGO	Land Acquisition and Compensation		Written Response	6.7
2873	NGO	Land Acquisition and Compensation		Written Response	6.7
2874	NGO	Land Acquisition and Compensation		Written Response	6.7
2875	NGO	Safety		Written Response	6.10
2876	NGO	Security		Written Response	6.10
2877	NGO	Safety		Written Response	6.10
2878	NGO	Issues around Borjomi		Written Response	5.14
2879	NGO	Baseline	water environmental	Written Response	5.11, 6.4
2880	NGO	Government Relations		Written Response	6.9
2881	NGO	Consultation		Written Response	6.9
2882	NGO	Consultation		Written Response	6.9
2883	NGO	Land Acquisition and Compensation		Written Response	6.7
2884	NGO	Consultation		Written Response	6.9
2885	NGO	Baseline	water environmental	Written Response	5.11, 5.14, 6.4
2886	NGO	ESIA Documentation and Translation		Written Response	6.9

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2887	Private Individual	Employment		Feedback Form	6.6
2888	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2889	Private Individual	Consultation		Feedback Form	6.9
2890	Private Individual	Employment		Feedback Form	6.6
2891	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2892	Private Individual	Employment		Feedback Form	6.6
2893	Private Individual	Consultation		Feedback Form	6.9
2894	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2895	Private Individual	Consultation		Feedback Form	6.9
2896	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2897	Private Individual	Community Investment Programme		Feedback Form	6.13
2898	Private Individual	Macroeconomics		Feedback Form	6.2
2899	Private Individual	Employment		Feedback Form	6.6
2900	Private Individual	Procurement		Feedback Form	6.6
2901	Private Individual		PD - Project Design Basis	Feedback Form	4.1
2902	Private Individual	Consultation		Feedback Form	6.9, 6.6
2903	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2904	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2905	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2906	Private Individual	Safety		Feedback Form	6.10
2907	Private Individual	Employment		Feedback Form	6.6
2908	Private Individual	Consultation		Feedback Form	6.9
2909	Private Individual	Employment		Feedback Form	6.6
2910	Private Individual	Employment		Feedback Form	6.6
2911	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2912	Private Individual		Construction - environment	Feedback Form	8.2
2913	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2914	Private Individual	Employment		Feedback Form	6.6
2915	Private Individual	Consultation		Feedback Form	6.9
2916	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2917	Private Individual		Environmental Management Plans	Feedback Form	8.2
2918	Private Individual	Employment		Feedback Form	6.6
2919	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2920	Private Individual	Consultation		Feedback Form	6.9
2921	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2922	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2923	Private Individual		Construction - Environment	Feedback Form	8.2
2924	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2925	Private Individual	Employment		Feedback Form	6.6
2926	Private Individual	Consultation		Feedback Form	6.9
2927	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2928	Private Individual		Construction - Environment	Feedback Form	5.14, 8.2
2929	Private Individual	Employment		Feedback Form	6.6, 6.8
2930	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2931	Private Individual	Consultation		Feedback Form	6.9
2932	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2933	Private Individual		Environmental Monitoring	Feedback Form	5.12, 8.2
2934	Private Individual	Employment		Feedback Form	6.6
2935	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2936	Private Individual	Consultation		Feedback Form	6.9
2937	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2938	Private Individual	Employment		Feedback Form	6.6
2939	Private Individual	Other Compensation		Feedback Form	6.8
2940	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2941	Private Individual	Consultation		Feedback Form	6.9
2942	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
2943	Private Individual	Employment		Feedback Form	6.6
2944	Private Individual	Land Acquisition and Compensation		Feedback Form	6.7
2945	Private Individual		Construction - Environment	Feedback Form	5.7, 8.2
2946	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2947	Private Individual	Access to Energy		Feedback Form	6.5
2948	Private Individual	Access to Energy		Feedback Form	6.5
2949	Private Individual	Community Investment Programme	Environmental Investment Programme	Feedback Form	8.2, 5.11, 6.13
2950	Private Individual	Previous construction experience		Feedback Form	6.9
2951	Private Individual	Previous construction experience		Feedback Form	6.9
2952	Private Individual	Water (social aspects)	Environmental Investment Programme	Feedback Form	6.8, 8.2
2953	Private Individual	Access to Energy	Environmental Investment Programme	Feedback Form	6.5, 8.2
2954	Private Individual	Infrastructure, Transport, Roads	Environmental Investment Programme	Feedback Form	6.8, 8.2
2955	Private Individual	Community Investment Programme		Feedback Form	6.13
2956	Private Individual	Community Investment Programme		Feedback Form	6.13
2957	Private Individual	Previous construction experience		Feedback Form	6.9
2958	Private Individual	Health		Feedback Form	6.10
2959	Private Individual	Land Acquisition and Compensation		Road show	6.7
2960	Private Individual	Land Acquisition and Compensation		Public Meeting	6.7
2961	Private Individual	Procurement		Public Meeting	6.6
2962	Private Individual	Monitoring - Social	Environmental Monitoring	Public Meeting	8.2, 8.3
2963	NGO	Safety	Environmental Monitoring	Public Meeting	6.10, 8.2
2964	NGO	Health		Public Meeting	6.10
2965	NGO	International Standards and Legal Compliance (social)		Public Meeting	6.11
2966	Private Individual	Access to Energy		Feedback Form	6.5
2967	Private Individual	Employment		Feedback Form	6.6
2968	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2969	Private Individual		Route	Feedback Form	6.7
2970	Private Individual	Procurement		Feedback Form	6.6
2971	Private Individual	Safety		Feedback Form	6.10
2972	Private Individual		Soil	Feedback Form	5.6
2973	Private Individual		Soil	Feedback Form	5.6
2974	Private Individual		PD - Reinstate & Erosion	Feedback Form	4.4
2975	Private Individual	Support for Project		Feedback Form	6.13
2976	Private Individual	Employment		Feedback Form	6.6
2977	Private Individual		Construction - Environment	Feedback Form	5.11
2978	Private Individual		Soil	Feedback Form	5.6
2979	Private Individual	Access to Energy		Feedback Form	6.5
2980	Private Individual	Community Investment Programme		Feedback Form	6.13
2981	Private Individual	Community Investment Programme		Feedback Form	6.13
2982	Private Individual	Infrastructure, Transport, Roads		Feedback Form	6.8
2983	Private Individual	Access to Energy		Feedback Form	6.5
2984	Private Individual	Employment		Feedback Form	6.6
2985	Private Individual	Community Investment Programme		Feedback Form	6.13
2986	Private Individual	Community Investment Programme		Feedback Form	6.13
2987	NGO	Employment		Written Response	6.9
2988	Number not used				
2989	Number not used				
2990	Number not used				
2991	Number not used				
2992	Number not used				
2993	Number not used				
2994	Number not used				
2995	Number not used				
2996	Number not used				
2997	Number not used				
2998	Number not used				
2999	Number not used				
3000	Government and Regulators	Water (social aspects)	water environmental	Written Response	5.5, 6.8

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3001	Government and Regulators	Water (social aspects)	water environmental	Written Response	5.14, 6.8
3002	Government and Regulators		water environmental	Written Response	5.14
3003	Government and Regulators	Water (social aspects)	water environmental	Written Response	5.8, 6.8
3004	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
3005	Government and Regulators		Oil Spill Mitigation	Written Response	5.14
3006	Government and Regulators	Issues around Borjomi		Written Response	5.14
3007	Government and Regulators	Issues around Borjomi		Written Response	5.14
3008	Government and Regulators	Issues around Borjomi		Written Response	5.14
3009	Government and Regulators	Water (social aspects)		Written Response	6.8
3010	Government and Regulators	Water (social aspects)		Written Response	6.8
3011	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.14
3012	Government and Regulators	Water (social aspects)		Written Response	6.8
3013	Government and Regulators	Security	Environmental Risk Assessment	Written Response	6.10
3014	Government and Regulators	Previous Construction Experience		Written Response	6.9
3015	Government and Regulators		Cumulative Impacts - Environment	Written Response	7.2
3016	Government and Regulators	Water (social aspects)		Written Response	6.8
3017	Government and Regulators	Water (social aspects)		Written Response	6.8
3018	Government and Regulators	Water (social aspects)		Written Response	6.8
3019	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3020	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3021	Government and Regulators		Geohazards	Written Response	5.5
3022	Government and Regulators		Route	Written Response	3
3023	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3024	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3025	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3026	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3027	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3028	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3029	Government and Regulators		Unplanned events	Written Response	7.2
3030	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3031	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3032	Government and Regulators		Unplanned events	Written Response	7.2
3033	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
3034	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
3035	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3036	Government and Regulators		Soil	Written Response	5.6
3037	Government and Regulators		Consultation	Written Response	3
3038	Government and Regulators		Soil	Written Response	5.6
3039	Government and Regulators		Soil	Written Response	5.6
3040	Government and Regulators		Erosion	Written Response	4.4

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3041	Government and Regulators		Approach & Methodology	Written Response	3
3042	Government and Regulators		Construction - Environment	Written Response	4.5
3043	Government and Regulators		Approach & Methodology	Written Response	3
3044	Government and Regulators		Route	Written Response	3
3045	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3046	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3047	Government and Regulators		Approach & Methodology	Written Response	3
3048	Government and Regulators		Erosion	Written Response	4.4
3049	Government and Regulators		Geohazards	Written Response	5.5
3050	Government and Regulators		water environmental	Written Response	5.8
3051	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
3052	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3053	Government and Regulators		Erosion	Written Response	4.4
3054	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3055	Government and Regulators		Erosion	Written Response	4.4
3056	Government and Regulators		Approach & Methodology	Written Response	3
3057	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3058	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3059	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3060	Government and Regulators		Climate	Written Response	5.2
3061	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3062	Government and Regulators		Geohazards	Written Response	5.5
3063	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.8
3064	Government and Regulators		Erosion	Written Response	4.4
3065	Government and Regulators		Environmental Monitoring	Written Response	8.2
3066	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3067	Government and Regulators		Project Description	Written Response	4
3068	Government and Regulators		Geohazards	Written Response	5.5
3069	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3070	Government and Regulators		Geohazards	Written Response	5.5
3071	Government and Regulators		Project Description	Written Response	4
3072	Government and Regulators		Geohazards	Written Response	5.5
3073	Government and Regulators		Oil Spill Mitigation	Written Response	4.9
3074	Government and Regulators		Erosion	Written Response	4.4
3075	Government and Regulators		Project Description	Written Response	4
3076	Government and Regulators		PD - Reinstate & Erosion	Written Response	4.4
3077	Government and Regulators	Infrastructure, Transport, Roads	PD - Project Design Basis	Written Response	4.1
3078	Government and Regulators		PD - Project Design Basis	Written Response	4.1
3079	Government and Regulators		Waste / Waste water	Written Response	4.8
3080	Government and Regulators		Geohazards	Written Response	5.5

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
3081	Government and Regulators		Project Alternatives	Written Response	3
3082	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
3083	Government and Regulators		Landscape / visual impacts	Written Response	5.8
3084	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.9
3085	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.14
3086	Government and Regulators	Tourism	Archaeology & Cultural Heritage	Written Response	5.1, 6.6
3087	Government and Regulators		Landscape / visual impacts	Written Response	5.9
3088	Government and Regulators		Project Alternatives	Written Response	3
3089	Government and Regulators		Approach & Methodology	Written Response	3
3090	Government and Regulators		Geohazards	Written Response	5.5
3091	Government and Regulators		Project Description	Written Response	4
3092	Government and Regulators		Approach & Methodology	Written Response	3
3093	Government and Regulators	Consultation	Approach & Methodology	Written Response	6.9
3094	Government and Regulators		Soil	Written Response	5.6
3095	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
3096	Government and Regulators		water environmental	Written Response	5.8
3097	Government and Regulators		Landscape / visual impacts	Written Response	5.9
3098	Government and Regulators		Unplanned events	Written Response	4.9
3099	Government and Regulators		Geohazards	Written Response	5.5
3100	Government and Regulators		Cumulative Impacts - Environment	Written Response	7.2
3101	Government and Regulators		Geohazards	Written Response	5.5
3102	Government and Regulators		Cumulative Impacts - Environment	Written Response	7
3103	Government and Regulators		Cumulative Impacts - Environment	Written Response	7
3104	Government and Regulators		Project Description	Written Response	4
3105	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3106	Government and Regulators		Geohazards	Written Response	5.5
3107	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.8
3108	Government and Regulators		Geohazards	Written Response	5.5
3109	Government and Regulators		Project Description	Written Response	5.11
3110	Government and Regulators		Geohazards	Written Response	5.5
3111	Government and Regulators		Surface water (rivers and lakes)	Written Response	5.5, 5.8
3112	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3113	Government and Regulators		Soil	Written Response	5.6
3114	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.6
3115	Government and Regulators		Construction - Environment	Written Response	7
3116	Government and Regulators		Project Description	Written Response	4
3117	Government and Regulators		Climate	Written Response	5.2
3118	Government and Regulators		Route	Written Response	3
3119	Government and Regulators		Climate	Written Response	5.2
3120	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
3121	Government and Regulators		Oil Spill Modelling	Written Response	5.5
3122	Government and Regulators		Hydrogeology / Geomorphology	Written Response	5.5
3123	Government and Regulators		Oil Spill Modelling	Written Response	5.14
3124	Government and Regulators		Route	Written Response	3
3125	Government and Regulators		Project Alternatives	Written Response	3
3126	Government and Regulators	Water (social aspects)		Written Response	6.13
3127	Government and Regulators	Water (social aspects)		Written Response	6.13
3128	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.8
3129	Government and Regulators	Infrastructure, Transport, Roads		Written Response	6.13
3130	Government and Regulators	Water (social aspects)		Written Response	6.13
3131	Government and Regulators	Procurement		Written Response	6.6
3132	Government and Regulators	Procurement		Written Response	6.6
3133	Government and Regulators	Community Investment Programme		Written Response	6.13
3134	Government and Regulators	Procurement		Written Response	6.6
3135	NGO	Community Relations	Oil Spill Modelling	Written Response	6.9
3136	NGO		Oil Spill Modelling	Written Response	4.9
3137	NGO	Security		Written Response	6.10, 6.10
3138	NGO		Route	Written Response	3
3139	Government and Regulators	Water (social aspects)		Written Response	6.13
3140	Other Organisation		PD - Project Design Basis	Feedback Form	4.1
3141	Private Individual		Construction - Environment	Feedback Form	8.2
3142	Private Individual	Community Investment Programme		Road Show	6.7, 6.14
3143	Private Individual	Community Investment Programme		Road Show	6.7, 6.14
3144	Other Organisation		water environmental	Written Response	5.8, 2613a
3145	Government and Regulators		Waste / Waste Water	Written Response	5.8
3146	Government and Regulators		Fish / fisheries	Written Response	5.11
3147	Other Organisation		Project Description	Written Response	4
3148	Other Organisation		Waste / Waste water	Written Response	4.8
3149	Other Organisation		Cumulative Impacts - Environment	Written Response	5.11, 7.2
3150	Other Organisation		Project Description	Written Response	4
3151	Other Organisation		PD - Testing & Commissioning	Written Response	4.3
3152	Other Organisation		Emissions / Dust	Written Response	5.3
3153	Other Organisation		Unplanned events	Written Response	5.5
3154	Other Organisation		Project Alternatives	Written Response	3
3155	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.5, 5.6, 5.8
3156	Other Organisation		Seismicity	Written Response	5.5
3157	Other Organisation		Soil	Written Response	5.8
3158	Other Organisation		Geohazards	Written Response	5.5, 5.8
3159	Other Organisation		Erosion	Written Response	4.4
3160	Other Organisation		Geohazards	Written Response	5.5
3161	Other Organisation		Soil	Written Response	5.6
3162	Other Organisation		Flora and Fauna	Written Response	5.11
3163	Other Organisation		Protected Areas	Written Response	5.11, 5.14
3164	Other Organisation		water environmental	Written Response	5.5
3165	Other Organisation		Environmental Management Plans	Written Response	8
3166	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.5, 5.8
3167	Other Organisation		Soil	Written Response	5.6
3168	Other Organisation		Geohazards	Written Response	5.5
3169	Other Organisation		Erosion	Written Response	4.4
3170	Other Organisation		water environmental	Written Response	5.8
3171`	Other Organisation		water environmental	Written Response	5.8
3172	Other Organisation		Oil spill modelling	Written Response	5.5
3173	Other Organisation		Waste / Waste Water	Written Response	4.8
3174	Other Organisation		Flora and Fauna	Written Response	5.11
3175	Other Organisation		Forests	Written Response	5.11
3176	Other Organisation		Flora and Fauna	Written Response	5.11

ID	Stakeholder Group	Topic - Social	Topic - Environmental	Meeting - Feedback type	Addenda section no.
3177	Other Organisation		Flora and Fauna	Written Response	5.5
3178	Other Organisation		water environmental	Written Response	5.14
3179	Other Organisation		Route	Written Response	5.8
3180	Other Organisation		water environmental	Written Response	5.14
3181	Other Organisation		Emissions / Dust	Written Response	5.3, 8.2
3182	Other Organisation		Noise	Written Response	5.3, 5.4
3183	Other Organisation		Oil Spill Modelling	Written Response	5.5
3184	Other Organisation		Cumulative Impacts - Environment	Written Response	5.11
3185	Other Organisation		Oil Spill Modelling	Written Response	5.5, 5.14
3186	Other Organisation		Cumulative Impacts - Environment	Written Response	5.11
3187	Other Organisation		legal compliance (standards) - environment	Written Response	8.2
3188	Other Organisation		Approach & Methodology	Written Response	3
3189	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.5
3190	Other Organisation		legal compliance (standards) - environment	Written Response	8.2
3191	Other Organisation		water environmental	Written Response	5.8
3192	Other Organisation		Noise	Written Response	5.4
3193	Other Organisation		Flora and Fauna	Written Response	5.11
3194	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3195	Other Organisation		Route	Written Response	5.8, 5.14
3196	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3197	Other Organisation		Oil spill modelling	Written Response	5.5
3198	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3199	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.5
3200	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3201	Other Organisation		Cumulative Impacts - Environment	Written Response	5.11, 7.2
3202	Other Organisation		Climate	Written Response	5.2
3203	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3204	Other Organisation		Approach & Methodology	Written Response	5.2
3205	Other Organisation		Oil Spill Modelling	Written Response	5.5, 5.14
3206	Other Organisation		Emissions / Dust	Written Response	5.2, 5.3
3207	Other Organisation		Oil Spill Mitigation	Written Response	4.1
3208	Other Organisation		Route	Written Response	3
3209	Other Organisation		Approach & Methodology	Written Response	3
3210	Other Organisation		Oil Spill Mitigation	Written Response	4.1
3211	Other Organisation		Project Alternatives	Written Response	3
3212	Other Organisation		Project Alternatives	Written Response	3
3213	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3214	Other Organisation		Hydrogeology / Geomorphology	Written Response	5.8
3215	Other Organisation		legal compliance (standards) - environment	Written Response	8.2
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APPENDIX 8 PIPELINE CONSTRUCTION

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PIPELINE CONSTRUCTION

1.1 GENERAL

This section describes the main activities and processes involved in constructing a large diameter onshore pipeline.

1.2 PRINCIPLES OF PIPELINE CONSTRUCTION

A pipeline can be broken down into three basic elements where different forms of pipeline construction method are used. They are:

(i) open cross-country areas, where the spread technique is used
(ii) crossings, where specialist crews and civil engineering techniques are used
(iii) special sections such as built up urban areas, restricted working areas, difficult terrain sections and environmentally sensitive areas

1.3 SPREAD TECHNIQUE AS USED IN OPEN CROSS-COUNTRY AREAS

The basic method of constructing steel, welded oil and gas onshore pipelines in open cross-country areas is generally known as the spread technique. The spread technique utilises the principles of the production line system, but in the case of a pipeline the product (the pipeline) is static and the individual work force, (crews) move along the pipeline track (right-of-way/spread). The implementation of the spread technique is conditional on the pipeline being welded above ground in maximum possible continuous lengths between obstructions/crossings (which can extend to lengths in excess of 10 kilometres). These welded pipe lengths are then immediately installed into unsupported/unobstructed trenches gradually in one continuous length utilising multiple (three or more) mobile lifting tractors (side-booms) in unison.

The breaks in the continuous main spread method of working result from the location of existing services, roads, railways, tracks, ditches, streams and river crossings, and are also dependent upon restricted working, time constraints and physical features/obstructions. These breaks in the main pipeline spread activities are undertaken by dedicated specialist crews utilising a variety of special construction techniques and are generally undertaken after the main pipeline sections have been installed.

The main pipeline spread installation is undertaken by dedicated crews undertaking one operation at a time commencing at one end of the pipeline and travelling forward to the other end at anything from 500m to 1,500m per day depending on the diameter of the pipe, terrain, soils, etc. There are a total of some 40 separate operations carried out in 7 main activity groups, as described in Sections A.5.1 to A.5.7 inclusive. The programme of activities and the start-up of the crews is dependent on available resources and the risk of one crew having an impact upon the following activities.

Because a pipeline is a production line, it is essential that the time periods between crews is such that there is no risk of one crew causing stoppage or disruption on the preceding or

subsequent crew. If the float between crews is not managed on a continuous basis, with the emphasis placed on the daily moving, then a concertina effect will result with substantial disruption and standby costs. Effectively, there can be up to a 4-week delay between crews to ensure that the concertina bunching effect of crews does not occur. Consequently, there are in the programme extended periods of time when there are no activities taking place along large sections of the pipeline route. The average time from start of ROW to commencement of land reinstatement is, typically, in the order of 10 to 15 weeks.

1.4 PRE-CONSTRUCTION ACTIVITIES

Pre-construction activities need to be carried out by the Installation Contractor prior to the start of the main pipeline installation activities. These activities include finalising the pipeline route, detailed design finalisation, mobilisation, notification of entry to landowners, setting-up of pipe yards and base camps, establishing temporary works requirements, setting-up of geographic positioning stations, design of land drainage in agricultural areas and reinstatement works, construction of temporary access roads, pre-environmental mitigation works, and agreeing with landowners any special requirements prior to entry onto their properties.

The Installation Contractor will carry out pre-entry surveys as-and-where required so as to record the condition of the land prior to the start of any work.

1.5 MAIN PIPELINE CONSTRUCTION ACTIVITIES

Once the pre-construction activities have been completed, then the main construction works can commence. Generally, operations are carried out in seven main activities groups, as described in the following sections:

1.5.1 Construction Activity Group 1 – Preparing Work Area
1.5.2 Construction Activity Group 2 – Layout Pipe and Weld above Ground
1.5.3 Construction Activity Group 3 – Excavate Trench and Installation of Pipe
1.5.4 Construction Activity Group 4 – Pipeline Crossings, Special Sections and Tie-Ins
1.5.5 Construction Activity Group 5 – Final Backfill and Reinstatement Works
1.5.6 Construction Activity Group 6 – Facilities and Pipeline Control
1.5.7 Construction Activity Group 7 – Testing and Commissioning

General details are shown in Figure 1.

1.5.1 Construction Activity Group 1 – preparing work area

The pipeline operations consist of:

1. Setting-out

The setting-out crews are the first personnel from the construction contractor's workforce to enter the site to commence the main construction activities. The setting out of the works should be scheduled to commence at least four weeks prior to the remainder of the construction activity group 1 activities. This work will be carried out with small four man crews using GPS and surveying instruments. Setting-out pegs will be placed at all boundaries, changes in direction and intermediate sightings on the proposed centre line and the extremities of the working easement.

In areas of open country where good and level access is available along the pipeline route and it is anticipated the rock or ground is of sufficient strength that it could impede progress of the trench excavation, then initial ground investigations works will be carried out directly behind the setting-out crew.

Part of the setting-out crew's duties is to identify any existing services that cross or are in close proximity to the pipeline and supervise the trial hole crew. The trial hole crew will hand excavate to expose, identify and determine the exact location of all existing services. This data will be recorded and transferred to the engineers for incorporation into the final pipeline design.

2. Advanced archaeology major works

This applies to locations where there are substantial/concentrated archaeology remains, which could involve extensive excavations. Provided access is available or requires minimal work along the ROW from an established entry point, a separate advanced ROW and topsoil/top cover crew will be mobilised to enable the archaeology works to commence in advance of the mainline and be completed before front-end crews pass. The topsoil/top cover at archaeology locations will be stripped by back-actors to avoid any disturbance to the stripped subsoil.

3. Right of Way/easement boundary demarcation – secondary ground investigation option 1

This will commence after the setting-out. A crew of personnel and equipment comprising mainly large heavy tracked plant will form the right of way access onto the land. The operations will include the removal of all hedging for disposal off site, bridge or flume pipe access across field ditches, protection of existing services by protection mattresses, re-grading of existing ground contours to assist access, the erection of goalpost and safety signs at overhead electric power lines and telecommunication cables, the placement of hard standings as required for car parking and the blasting/removal and re-grading of rock areas or outcrops to provide a level and safe excavation line/running track along the entire pipeline route.

Additional crews will be provided to install offsite ROW accesses along the pipeline route to enable the ROW crew to gain access to the working areas, where access from the public road is not available or would cause a safety risk, or as a result of locked out locations or environmental concerns. Agreement with the landowners involved in any offsite access must be finalised prior to pipeline commencement.

Where temporary ROW fencing is required then additional crews will be required to erect this fencing to delineate the working area.

During the ROW and fencing operation it will be possible to undertake ground investigation works by the excavation of trial pits at 100 metre intervals to determine actual ground sub-strata, trench stability, ground water levels and seepage. These investigations, however, can only take place at this time on open areas where restrictions due to land use (agricultural) and environment do not exist.

4. Pre-construction terrain and ground stability (excluding dewatering)

At locations where there is a risk of ground movement that could result in safety risks to the construction activities and/or undermine the pipe during installation and the period prior to final

reinstatement then permanent stability of the affected terrain needs to be undertaken. This work can be separated into two elements:

- Removal of material such as the overburden at the top of ravines and the removal of loose material that could move during the installation works
- Addition of material such as Bentonite, which is injected under pressure into gravels with high and fast water tables and deep mining areas to provide a protective curtain around the pipe. It also includes the adding (placement) of boulders/ground at the toe of steep gradients on forwarded and side slopes in the second element

5. Trench excavation in rock areas

In areas where rock is confirmed as such by the initial ground investigation works then the trench is excavated ahead of any pipe operations. This sequence of working is undertaken to ensure that the excavation of the trench cannot cause any damage to the pipe and/or pipe coating and provide an extended safe working width for the excavation crews allowing double-sided trench working by excavators/ breakers.

Following the review of the data from the initial ripper and trial hole surveys, the ground will be classified in ease of excavation into five groups defined by the method of removal. These are (i) utilising standard excavation, (ii) larger more powerful excavators (face shovels converted to back-actors), (iii) ripping/hydraulic hammer and excavation, (iv) blasting/hydraulic hammer and excavation and (v) rock trenchers (saw and blade). The finished trench should be to the correct depth and width to suite the pipe diameter, plus any bedding and pipe cover. The trench should also be in a straight line so that the pipe can lay central in the trench without coming into contact with the trench sides. All loose and jagged outcrops, which could come in contact with the pipe during lay operations, will be removed.

The excavation will commence with dedicated crews immediately following the ROW operation. The forward progress will be dependent upon the ground strength, grain structure, terrain, access, method of removal and number of crews/equipment employed.

6. Pre-construction cut-off drains

All cut-off drainage works, which comprise the connection of existing drains to a new header pipe, will commence immediately after the right of way and fencing operations.

Cut-off drainage works will be undertaken at locations where there are existing concentrated drainage schemes on agricultural land and where agreement is reached with the landowners and/or occupiers to their installation. This work will be resourced taking account of the scope of work and the requirement to achieve pipeline installation progress of, say, 500 to 1,500 metres per day along the pipeline route.

7. Topsoil strip -secondary ground investigation Option 2

Topsoil strip operations commences after cut-off drainage operations and is scheduled to allow adequate time for completion of the drainage works in the event that unforeseen obstacles or circumstances are highlighted during the execution of the drainage installation operations.

The topsoil operation consists of 1 crew with plant comprising up to 8 excavators/ bulldozers removing the topsoil to its full depth (typically, = 300mm) and storing in a single stack on the

opposite side of the easement to the trench excavation material. The topsoil is stripped with 2 to 3 excavators along the easement boundary on the opposite side to the topsoil stack area. This provides a subsoil interface/cutting edge for the dozers to work from in pushing the topsoil across the easement.

In areas where topsoil removal is required then the ground investigation works are undertaken following the removal of the topsoil as this avoids any risk of topsoil contamination with the subsoil. The investigation works are as those detailed in the ROW section and comprise the excavation of trial pits at 100 metre centres to determine actual ground sub-strata, trench stability, ground water levels and seepage.

1.5.2 Construction Activity Group 2 – layout pipe and weld above ground

The pipeline operations consist of:

1. Project mechanical procedures/testing of welders

Prior to the start of any mechanical works the Contractor will issue for Client approval a full set of mechanical procedures for bending, welding, x-ray and coating. These procedures will address how the Contractor intends to undertake the work in accordance with the project specifications detailing equipment and specific mandatory requirements. The procedures, particularly with regard to welding and x-ray will be sufficient to cover the full ranges of the various parameters characteristic of the project in terms of diameter, wall thickness and technique. Once the documented procedures are approved then full trials for each element of the works will be carried out, fully inspected and witnessed by the Client. The welding will include non-and full destructive testing to ensure that the procedure welds are undertaken in strict compliance with the contract requirements and fully comply with the minimum strength, hardness and quality requirements of the relevant specifications.

Once the procedures have been approved then the welders will be tested to ensure that they can comply with the requirements of the procedure welds. A register will be maintained of the welders employed on the project with the various welding techniques they are approved to work on.

2. Double-jointing

Double-jointing of the single approximately 12 metre long pipes into 24 metre lengths will, if considered economically viable by the project, be carried out in the pipe yards prior to pipeline stringing. Double-jointing permits the doubling of the welding progress with the same basic welding resources or allows the same production with a much smaller crew.

In considering double-joints due consideration needs to be given to the use of specialist pipe bogies for the moving of the 24 metre pipes, the capability of the local road system to accommodate the vehicles and the requirement for special road movement permits. The double-jointing can be placed on the easement but this results in additional cost due to double handling of the pipe and the need to continually move the double joint equipment, which can offset any savings from increased welding production.

3. Pipe stringing

The pipes and pre-formed bends will be scheduled to be delivered to, and stock piled at, the proposed pipeline pipe yards some 4 to 8 weeks in advance of stringing operations. The pipe supply should ensure that the various grades, wall thicknesses and coatings are supplied in sufficient and correct quantities to meet the programme.

Immediately following ROW or topsoil strip or excavation in rock areas, the pipe stringing operations will commence, which involves laying the pipe lengths along the easement length using pipe trailers. A typical crew will consist of two cranes - one at the base camp loading the pipe trailers and the other on the pipeline easement off-loading the pipe trailers.

In the event that ground conditions do not permit travel down the easement with standard or special heavy-duty pipe trailers then the pipes will be loaded on to tracked pipe carriers at the public roads or at a point where the change in ground conditions occurs and permits the turning of the wheeled pipe trailers.

4. Forming field bends (cold bending)

Once the pipe has been strung along the easement, engineers will follow to determine the location of all bends required in order that the pipeline can follow the contours of the land and the required line and level as detailed on the drawings. There are two types of bends normally used ie hot pre-formed or forged bends which are manufactured off site in a factory and are to a radius of 5 or 3 times the pipe diameter and cold bends which are to a radius of 40 times the pipe diameter and are formed in the field.

A typical cold bending crew consists of a four-man team together with a bending machine and a side boom tractor. The bending machine is towed along the pipeline route by the side boom and includes “formers” consisting of 20 – 150 ton hydraulic rams, which bend the pipe to the required radius and angle. The side boom acts as a lifting device and has a fixed jib attached to a tracked dozer with a capability of lifting between 15 to 120 tons, dependent upon the size of the machine used.

The number of cold bends required depends on the route and contours of the pipeline. Typically, they can range from 1 pipe in 10 in developed regions to 1 pipe in 50 in open country. The cold bend angle that can be achieved ranges from maximum angles of 12 degrees (42” pipe) to 40 degrees (12” pipe).

5. Welding of the linepipe

The welding of the pipeline will commence a few days after the cold bending crew. The welding crew will weld the pipeline in continuous lengths between features such as roads, watercourses, tracks, railways, services and other underground obstacles that prevent the linepipe being continuously installed in the trench.

There are primarily two methods of welding which are manual or automatic. As the names imply manual welding involves the welding of the pipe by welders and automatic involves a semi-automatic system. At present, and with the correct welding experience, there is no substantial difference in quality or production.

Automatic welding is used primarily for three main reasons:

- Ensure welding quality
- Increase/sustain a high daily production rate
- Reduce the overall manpower requirements

Manual welding is used where:

- A supply of experienced welders is readily available
- Difficult terrain, weather and site conditions exist
- Special sections and areas with a high percentage of tie-ins
- High production rates cannot be achieved

Both systems generally (although certain automatic systems can now do single pass complete welds) operate on a front-end/back-end principle. The front-end consists in a manual operation with, say, 3 separate welding stations placed on CAT D6 carriage consisting of a HIAB for the welding shelter (used in inclement weather or windy conditions), 4 welding bullets and a compressor. The welding stations work on 3 separate joints and complete one pass before moving on with the sequence being the bead (2 - 4 welders), immediately followed by the hot pass (2 – 3 welders) and then hot fill (2 welders). With the automatic process, 1 machine deposits sufficient weld metal equivalent to the 3 manual passes. The weld is allowed to cool after the front-end passes and then sufficient welders working in pairs or multiple automatic machines follow on to fill and cap that day's production.

The crew will achieve progress in the order of one weld approximately every 3 to 5 minutes or up to 90 to 150 welds per day, which is equivalent to 1,000 to 1,500 metres of linepipe on 12 metre pipes and up to twice that if double-jointed pipes are used.

6. Welding of fabrication pipework

As the mainline welding crew is set up for speed and any reduction in the speed will increase costs and could cause delays to following operations then any fabrications or pipework involving bends or difficult set-ups or welds that require more than the bead before lowering off (creating cracks) will be left out. These fabrications are welded together by a small dedicated crew who complete these welds prior to the field joint coating crew.

7. NDT inspection

All welds on the pipeline are generally subjected to inspection by radiography. This is achieved on the main pipeline by an internal x-ray tube travelling along the inside of the pipe carrying out x-rays at each weld for approximately 2 minutes per weld. On completion of the x-ray the film is taken to a dark room and processed in time for the results to be available for inspection at the end of the day or early the next day. Welds, which do not meet the required acceptance criteria, are either repaired or cut out and re-welded.

Experienced and qualified x-ray specialists undertake the radiography under controlled conditions. Before the operation is started, the section of pipeline is cordoned off by marker tape to stop entry by non x-ray personnel and audio/flashing warning alarms are activated during all times when the x-ray tube is energised. The x-ray personnel are on constant surveillance to ensure that the workforce and members of the public are aware of the x-ray activities and only authorised access is permitted.

Welds completed by semi-automatic welding processes are examined using automatic ultrasonic testing (AUT) techniques. This consists of an assembly that traverses the circumference of each completed weld in order to detect any defects. The results of each ultrasonically inspected weld are automatically recorded and are used to determine whether a weld repair is required and if so what type.

8. Weld rectification (repairs)

A weld rectification (repair) crew follows immediately behind the NDT inspection activities to either carry out repairs to or cut out any defective weld. On completion of all repairs a further x-ray is carried out on the weld to ensure that the finished weld conforms to the standard required. The x-ray of repair welds is usually carried out from the outside of the weld by a two-man crew.

9. Field joint coating

The coating of the pipeline field joints to prevent corrosion starts a few days after the welding. This extended period is to allow for any repairs or cut-outs to be completed without prejudicing the coating crew's operations.

1.5.3 Construction Activity Group 3 – excavate trench and installation of pipe

The pipeline activities consist of:

1. Trench excavation

In areas other than rock, trench excavation commences a few days after the field joint coating operation. A typical trench excavation crew consists of 5 - 8 excavators working in line. This operation only excavates the length of open cut trench sufficient to install the main line welded pipe; it does not excavate any roads, ditches, services or obstacles. The number of excavators employed will be such that the amount of trench excavated in a single day matches the rate of progress of the welding crew. The spoil from the trench will be stored adjacent to the trench on the opposite side of the ROW from the topsoil stack.

The finished trench will be to the correct depth and width to suit the pipe diameter, plus any bedding and pipe cover. As far as possible, the trench should also be in a straight line so that the pipe can lay central in the trench without touching the trench sides. All loose and jagged outcrops, which could come into contact with the pipe during laying operations, will be removed.

2. Trench excavation archaeology watching brief

As part of normal good practice an archaeologist will be present during the main trench excavation undertaking a watching brief of the material being excavated. The archaeologist will have the authority (subject to safety constraints) to stop the trenching works if he considers the excavation has encountered a major archaeological find.

3. Finalise drainage design

In agricultural land, the Contractor will record the existing drainage system actually intercepted by the pipeline. The information will be reviewed taking account of the intended proposals and

any final amendments to the system finalised at this stage following discussion with the Owners or Occupiers.

4. Pipe installation (lower and lay) – above ground tie-in sections

The linepipe will be positioned approximately 5 metres from the trench centre-line and will be installed into the open unobstructed trench utilising a number of side-booms. This operation will usually be carried out immediately following the excavation crew.

As the linepipe is being installed a coating crew will be present who will holiday detect the pipe to detect any damage to the pipe coating just prior to the pipe entering the trench. Any holidays (damage) detected will be repaired by a fast setting repair coating.

In areas of rock, the pipe installation will commence anything from 5 to 15 days after the welding crew.

If there are any above ground breaks in the mainline due to access openings across the ROW, expansion breaks or bend breaks, then these will be welded above ground, x-rayed and coated during the excavation and lowered-in as part of the mainline lower & lay operation. This will optimise the use of the side-booms within the lower & lay crew and reduce the number of below ground tie-ins.

5. Cross trench drainage connections

In agricultural land, the permanent reinstatement of the existing land drains to be replaced across the pipeline trench is carried out prior to the trench backfill operations. The replacement drains extend for a short distance into undisturbed ground.

On completion of inspection of the reinstatement works, the trench is backfilled and compacted in layers to the underside of the drain. This work is only undertaken in extreme locations to supplement the main pre- and post-drainage schemes

6. Installation of permanent cathodic protection system test posts

Either as part of the fabrication welding crew activities (if the location of the CP test posts are known) or as the pipe is being installed Cathodic Protection lugs are welded to the pipe. These lugs which can be 50mm square plate are welded on the pipeline using low hydrogen welding rods where test posts will be installed to check the ground/pipe to soil potential. The test posts are placed at about 1km distances along the pipeline and located at fixed boundaries such as road crossings or other locations, which have relatively easy access. Cables are attached to the lugs the whole area coated, checked for holidays and the cables brought to ground level during backfilling and left. During the reinstatement activities the Cathodic Protection test posts are installed with the cable running up through a duct in the test post and tied off. The test post is then concreted into the ground directly above the pipeline.

7. Temporary cathodic protection system

As the pipeline may be buried for the full construction period before the permanent Impressed Current Cathodic Protection (CP) System is activated, then some form of temporary system needs to be installed prior to the backfilling of the pipe. The temporary system, typically,

comprises a number of zinc anodes attached to the pipeline at regular intervals. These are buried parallel to and at a distance of, say, 3 metres from the pipe.

8. Backfill of the pipeline trench

Trench backfill starts immediately following the placement of the linepipe in the trench and the undertaking of a survey of the pipe levels by the engineers to confirm that the required pipe cover has been achieved. There is a requirement that the initial backfill around the pipe and to 300mm above the crown be of loose and relatively fine particles, which can be readily compacted and do not damage the pipe coating. In areas of rock it will be necessary to place the pipe on a 150mm bed of similar material. In order to provide this material it may be necessary to import sand/soft material offsite, sieve the excavated material or crush the excavated material. The sieve and crusher equipment will be portable machines, which will be transported along the pipeline ROW.

The pipe is backfilled over the entire length except for, say, 30 metres at each end of the pipeline work section, which is left free to facilitate the tie-in to the crossing/line break pipe work.

1.5.4 Construction Activity Group 4 – pipeline crossings, special sections and tie-ins

The pipeline operations consist of:

1. Crossings

The crossings are carried out by a number of different and dedicated crews simultaneous with the main trench excavation works and final tie-in to the main pipe installation being carried out by subsequent tie-in crews following completion of the crossings and main pipeline installation works. The crossings are undertaken by two distinct methods of construction consisting of either:

- Open cut
- No dig technique

There are various options to the two methods of working and the actual method employed at any given location will be dependent upon the ground conditions, pipe diameter, local environment, third party restrictions and the type of obstruction being crossed.

The extent of a crossing in design terms is normally defined from fixed locations, which extends either side of the crossing land take or boundary fencing. However, the length of a crossing in terms of construction includes the crossing plus any temporary works to facilitate the installation, the swan neck offsets to bring the pipe back to normal cover and the tie-in pipes to connect the crossing to the mainline.

A key aspect in the determination of the method of construction that will be used at any crossing will be the requirements of the regulatory authority/owner that has jurisdiction over the crossing. Part of the approval process with the regulating authority will be the issue of detailed plans and calculations of the design, which will be supported by fully detailed construction method statements.

Details of the various crossing methods are described herewith and are taken in the order of ease of construction and cost.

Open cut

Open cut is generally by far the most cost effective way of crossing obstacles that cause breaks in the mainline and is undertaken by crossing the obstruction by means of an open excavation. The trench excavation at the obstruction, whether it be a ditch, a road, a railway, a river, or a service is excavated for the full length of the crossing prior to the installation of the pipe. Accordingly, in order to minimise the time for which the crossing trench is open, the welding, NDT inspection and field joint coating of the section of pipe required for the crossing is completed in advance of excavating the trench. An open cut crossing can very often be installed in one working day and the road or ditch temporary reinstated sufficiently to fulfil the function for which it is required prior to the crew-leaving site for the day.

No-dig technique

At locations where open cut methods are impractical or not permitted for whatever reason, then no-dig techniques have to be implemented. No-dig techniques can be classified into two main groups - sleeve or 'bare' line pipe. The actual method that will be used is determined by the ground conditions, third party restrictions, length of crossing, diameter, and design/safety requirements.

The different options available for no-dig techniques are described briefly below:

- Auger Bore is a term used to define a method where the pipe is supported by cranes/side-booms in a pit and a cutting head removes the spoil at the face, this is transported by flights down the pipe and is discharged into the pit through the auger machine which is positioned at the rear of the pipe being bored

- Thrust Bore is a term used to define the installation of pipes by the manual excavation of the face with the pipe pushed forward from a thrust pit with hydraulic rams off a thrust wall at the back of the pit. Due to the risk of a potential face collapse upon the miners, the face has to be self-supporting. Accordingly, this method is used primarily in stable/hard ground conditions where the strata or strength precludes auger bore. As labour has to work at the face then the minimum pipe diameter normally considered is 36".

  There are two options with the thrust bore method of working:

  – Concrete Sleeve. This method comprises the pre-installation of concrete sleeve pipes, which are typically 2.5 metres in length. Following installation of the concrete sleeve, linepipe in lowered into the thrust pit and pushed/pulled along the sleeve to a point where the next pipe can be lowered, welded, x-rayed, coated and then pushed/pulled along the sleeve
  – 'Bare' Linepipe. This method comprises the installation of similar equipment to that for the concrete sleeve except that the linepipe is used for the thrust pipe rather than a concrete sleeve

- Tunnels are not expected to be used on this project and, as such, are not discussed further.

- Horizontal Directional Drill (HDD) is a term used to define the method of installing a pipeline in long sections without taking entry onto the land. The method involves the welding of the pipeline into a continuous string above ground on one side of the crossing and pulling this string through a pre-drilled hole to the other side. The pipe will be welded, inspected, coated, tested and sitting on heavy-duty rollers prior to the drill operation commencing on site. Normally, a pre-installation hydrostatic test of, say, 4 hours duration, is carried out on the completed string to confirm the pipe integrity.

  - The drilling machine will be positioned on the opposite side to the welded pipe string. The profile of the crossing will consist of five main elements - the entry angle, the radius of the sag bends, any side bend configuration, the exit angle and the intended reamer size. The accuracy of the drill can be maintained within a tolerance of 0.1% of the proposed profile at any point during the drilling process. The drill machine will be positioned at the drill entry point and at an angle from the horizontal of around 5 degrees for a 42" pipe)
  - The drill will then commence with a 3 or 5-inch drill rod installed in 3 or 5 metre sections to drill a pilot hole along the proposed drill profile. The position of the drill head will be continually monitored via the on site computer system. Bentonite under pressure (20 bar) is forced out at the drill head to make a route through the ground, allow steering and to support the annulus walls. Once the pilot hole is complete further passes are then carried out with reamer heads which increase the hole size to around 150% of the pipe diameter to allow pipe installation
  - On completion of the reaming the leading pipe of the weld string (to which a swivel pull head has been welded) is connected to the drill rods and the process of pulling the pipe into the annulus begins. During this operation the drill rods are removed as the pipe progresses forward towards the drill side. Ideally, the pipe pull is carried out in one continuous operation without any delays. When the pipe pull is complete the pipe coating integrity is checked by placing an electric current down the pipe to ensure that it is within the required limits and the equipment then removed from site with the Bentonite disposed of in an approved manner

2. Special sections

A special section is a term used to define any section of the pipeline that (i) cannot be undertaken by the spread technique, (ii) is a break in the mainline that does not conform to the definition of a crossing as described above, (iii) locations where time restrictions apply, (iv) environmentally sensitive areas where third party specific constraints apply, (v) restricted working, (vi) difficult directional drills or (vi) urban areas. By designating a section of the pipeline as a special section it highlights the fact that the section is more complicated than the mainline and will involve unique methods of working, generally low production and higher than average project costs.

There are four basic forms of construction methods that are used in special sections:

- Pull/Push Method of Construction is mainly used in unstable ground areas where the ground would not support the construction traffic and/or where the batter angle of repose of the excavated trench is below 25 degrees. The method involves installing the pipeline across an obstacle by welding the pipe which has concrete weight coating on heavy duty rollers in a continuous length and pulling the pipe with winches at one end, whilst at the same time side-booms/excavators push the weld string along the rollers into

a pre-dug flooded trench with tie-in between sections undertaken in fully supported (piles or boxes) pits

- Mainlay Operation which involves the installation of the pipeline in the trench one pipe (single or double-jointed) at a time. This method of pipe installation is used in locations of narrow ROW, unstable ground and/or urban areas and utilises a single, complete crew which carries out all operations including excavation, pipe installation, welding, NDT inspection, coating and backfilling. Mainlay techniques are used at locations where the spread method cannot be employed

- Horizontal Directional Drill – see above

- Above Ground Pipework is not expected to be used on this project and, as such, is not discussed further

3. Tie-ins

Tie-ins are the welds generally undertaken in the trench that connect two sections of pipeline together. Once the crossing/special sections and the main pipeline either side are installed, tie-in crews are then employed to tie the crossing and special sections to the main line. The tie-in crews consist of excavators to prepare the trench for entry by the welders, side-booms to lift and set up the pipe for welding, mobile welding crews, mobile NDT inspection crews and mobile coating crews.

1.5.5 Construction Activity Group 5 – final backfill and reinstatement works

The pipeline operations consist of:

1. Special backfill requirements for washout, stabilisation, geotechnical protection

These are needed at locations to ensure long-term trench stability, or where it is considered that additional stability is required following trench excavation. Special backfill requirements are essential to control the effects of water on a trench line and mitigate against natural hazards that could result in pipeline failure or extensive operational remedial costs due to exposure and movement such as seismic conditions, erosion, mining subsidence. In order to deliver a full life-cycle cost effective pipeline system due allowance must be made to ensure those elements that could result in extensive pipeline operational costs are addressed and the necessary permanent works undertaken as part of the pipeline construction activities.

2. Final backfill and clean up

On completion of the tie-in work activities on the mainline, a final backfill and grade crew will progress along the pipeline. This crew will inspect the coating of the exposed pipe and any holidays (coating defect) will be repaired as necessary and the section of exposed pipe backfilled to ground level. All temporary materials, trench supports including piles, surplus excavations, rubbish, etc will be systematically removed from the construction easement area and then the sub soil levelled to its original contour or as determined by operational requirements.

3. Post construction lateral drains

In areas where pre construction header drains have been installed or where additional drainage is required following trench excavation, then lateral drains will be installed either side of the pipeline to collect and remove surface water from the pipeline ROW area.

4. Subsoil cultivation

In agricultural land, the subsoil cultivation involves the final surface preparation of the subsoil including reforming of open cut ditch banks and other features which may have inadvertently been affected by the right of way operation in gaining access.

Once all the features have been returned to their original condition and the surface re-levelled, the subsoil over the whole working area will be broken up into a fibrous condition. Any shallow land drains will be marked and the subsoil carefully "ripped" parallel to those drains to avoid any damage to the shallow drainage installation. Having broken up the subsoil into a fibrous condition the entire area is then worked and levelled with bulldozers without inducing any unnecessary compaction.

5. Permanent works for post construction terrain stabilisation

At locations where a risk is considered to exist then additional works will be undertaken immediately following ground final backfill and clean up. For example, surface ditches will be dug parallel to the pipeline with outfalls to existing surface water systems in areas where the backfill is susceptible to water disintegration or can become air blown in heavy winds it will be encased within stone paving. Final ground and/or trench stabilisation will be addressed with the final grading/ reshaping of forward and side slopes and smoothing out any ground removal undertaken on the initial ROW operations in order to provide protection against run off water into the trench.

6. Reinstate offsite roads and provide operational access

There will be a general commitment to either leave the temporary roads or remove them with a provision for retaining sufficient temporary roads to ensure safe operation. The road crew will commence out of sequence with the main operations working as and when required in removing/upgrading/reinstating existing and temporary roads that are to be retained, also, as part of the operation, reinstating as much as possible of the route but permitting access to the final reinstatement crews. New roads in ecologically-sensitive areas will be removed.

7. Topsoil replacement and final reinstatement

The topsoil replacement and final reinstatement of the pipeline easement area immediately follows the subsoil preparation and cultivation activities. This operation consists of a number of activities, which have to be carefully monitored to avoid unnecessary compaction of the soil strata, and includes:

- Removal of all temporary access equipment
- Final formation of ditch banks
- Clean up/patch up any damage to highways
- Replacement of topsoil
- Final level on open country

- Erection of new permanent replacement boundary fencing and new hedging
- Erection of marker, aerial and Cathodic Protection posts

Wherever possible, the final reinstatement will be undertaken in dry conditions.

On completion of final reinstatement the easement land will be brought back to its original condition, as follows:

- Open country – Any fencing will be removed and the land left for immediate occupation
- Special sections/isolated areas – Any fencing removed, access roads reinstated to the agreed level with security barriers erected if required/agreed and the land left for immediate occupation
- Arable land -Fencing will be removed and the land fit for immediate planting
- Grassland - The temporary easement fencing will remain erected and the ground left ready for re-seeding at the earliest growing season. The temporary easement fencing will then be removed

1.5.6 Construction Activity Group 6 – facilities and pipeline control

The main items consist of:

- Block valve sites
- Pumping stations
- Offtake facilities
- Cathodic protection system
- SCADA and leak detection system
- Electrical power supply
- Telecommunications system
- Control centres

The work associated with these facilities and systems will, in the main, be carried out by separate contractors to the Pipeline Installation Contractor. However, all work involved with these facilities will be co-ordinated with main pipeline construction to ensure that the overall schedule for the project is achieved whilst optimising in-country logistics and ensuring that the requisite HSE standards are maintained.

It is not considered necessary to discuss these activities in detail as, to a large extent, they are carried out independently of the main pipeline construction.

1.5.7 Construction Activity Group 7 – testing and commissioning

The pipeline operations consist of hydrostatic testing, pre-commissioning and commissioning of the pipeline. The last two activities are considered outside the scope of main pipeline construction activities and, as such, are not discussed further.

1. Hydrostatic testing

The post-pipeline construction testing operations are carried out to ensure that the installed pipeline complies with the appropriate regulations and can be declared fit for its intended use. The testing of the pipeline is undertaken on completion of all pipeline construction work including if possible final reinstatement, which is weather dependent.

First of all, the pipeline is cleaned and filled with fresh water by the use of internal pigs. The use of the pigs ensures that all air is removed from the pipe. The pipeline is then tested, depending on the code and type of pipeline (oil, gas, etc), to, say, 125% of the maximum operating pressure for a continuous period of 24 hours. On acceptance of the pressure test the water will be removed by the use of the internal pigs propelled by air.

The first task in testing is to establish the number of test sections required for the pipeline. This is determined based on:

- availability of suitable water and location of sources
- location of suitable disposal sites for test water
- variation in altitude which affects the actual test pressure and allowable hoop stress
- length of section, which should be based on a risk assessment on the effect the considerable volumes of water, following a failure, could have on the local environment at any sensitive area

Under normal circumstances, test sections are limited by 100-metre change in altitude and 100km in length.

It may be that, due to conservation or supply difficulties, water will have to be transferred from one test section to another along the pipeline. If this is the case then careful consideration of the installation programme should be undertaken with completion taking full account of water supply and disposal requirements. The transfer of test water from one section to another will be via hard (steel) pipework so that no water is lost or spilled. As the water is transferred from one section to the next, it will be filtered and its chemical composition checked and modified as necessary.

In addition, it may be necessary to chemically treat the water to prevent biological growth in the water or inhibit oxidation of the internal pipe surface (rusting). The selection of chemicals will be subject to very strict evaluation prior to the start of the hydrostatic testing and will be based on chemical and physical analysis of the water at the actual sources. The addition of the chemicals to the test water will be subject to close scrutiny and control and the water will be checked periodically to ensure that it remains within the specified compositional limits. An environmental permit will be obtained for all water abstraction and discharge associated with the hydrostatic test(s).

Temporary pig traps will be installed at both ends of the pipeline section to be tested. These traps will be fully certified for the proposed test pressures. The temporary equipment at the 'upstream' end of the test section (where the water will be introduced into the pipeline) includes, large volume/low pressure filling pumps, break or settling tank(s), low volume/high pressure testing pumps, chemical injection tanks and pumps, hard (steel) pipework, compressors, temperature, pressure and volumetric flow instrumentation, pig traps, testing cabins, power supply generators, filters/filtration units, office and telecommunications facilities. Similar equipment will also be installed at the 'downstream' end although the type and amount

will depend on whether the test water is being disposed of transferred to the next pipeline section.

All the temporary equipment needed for the hydrostatic testing operation will be fully certified for the test pressure(s) concerned and copies of the certificates will be available onsite for inspection prior to the start of the programme.

Normally, the block valves will be tested in-line with the valves 'locked' open and any instrumentation disconnected for the testing operation.

Once a test section has been completed mechanically and is declared ready for testing, the temporary equipment will be installed at both ends of the section. The section will initially be pigged with a bi-directional swabbing pig propelled by air to ensure that all debris is removed from the line. The pipeline will then be filled with water utilizing a 2 possibly 3-pig train with, typically, a 500 metre long slug of water between the 1st, 2nd and 3rd pigs. The high volume/low pressure pumps will be used for this activity and the volume of water entering the pipeline will be controlled and measured to give a linefill rate of, say, 1km per hour.

It is normal practice (and sometimes a requirement of the relevant code) for one of the pigs to have an aluminium gauge plate attached to check for pipe ovality/dents. The gauge plate is circular and has a diameter equal to 95% of the internal pipe diameter (bore).

Once the line is filled it will be left to stand to allow the water temperature to equalize to the surrounding ground conditions; this is typically 3 to 5 days but, as expected, is extremely variable. Once the temperature is stable the test will commence with an initial rise in pressure to 35 bar to ensure that the air content is less then that required by the design code (normally 0.2%). The low volume/high pressure pumps are used to add this water into the pipeline.

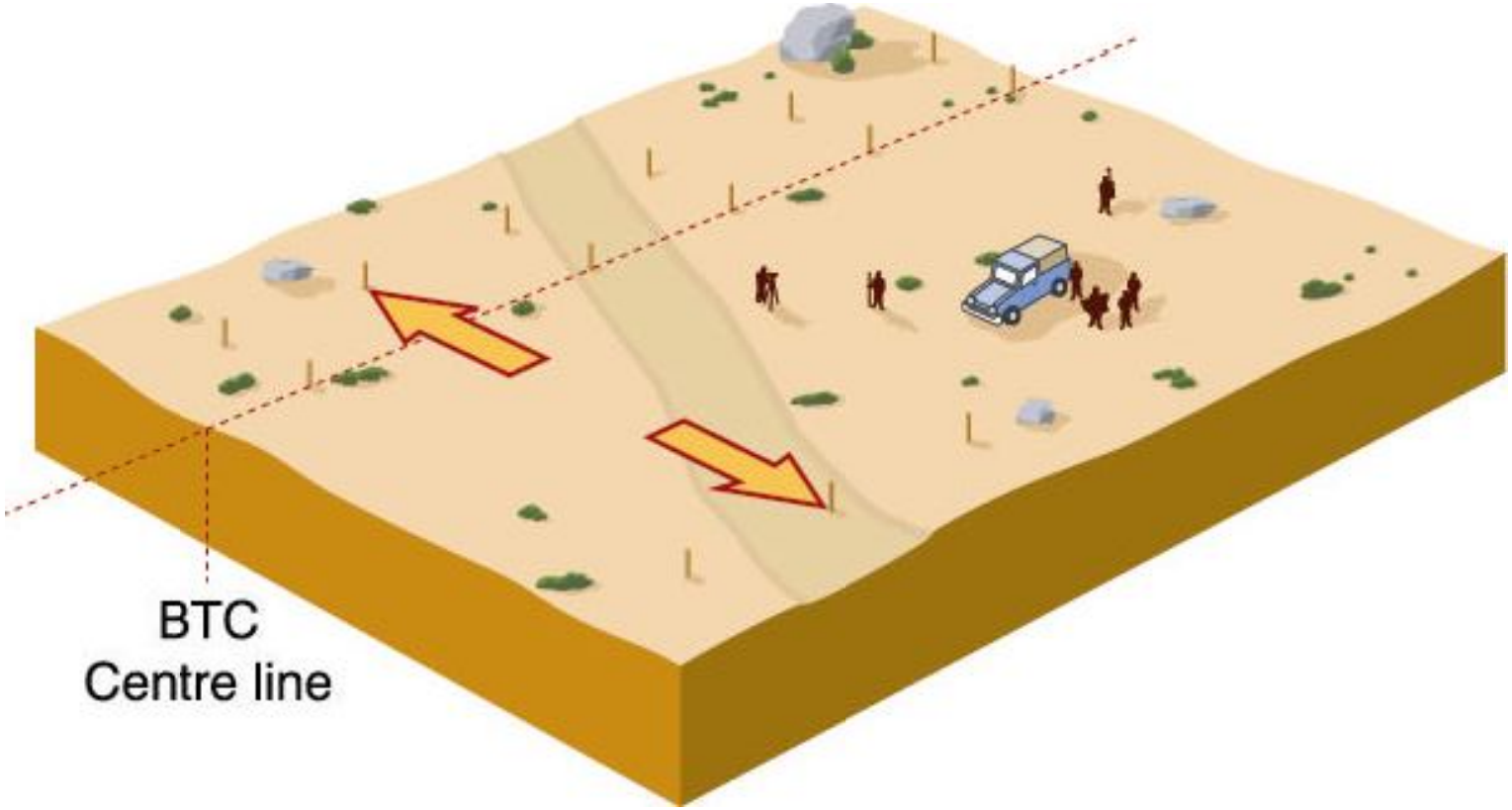
With the air content confirmed, the test pressurisation continues to the test pressure at a steady rate of, typically, no faster than 1 bar per minute. Once the test pressure is reached it shall be held for the required time, which for this Project is likely to be 24 hours. During this 'hold' period, the pressure and temperature will be measured, monitored and recorded continuously.

Small leaks during the testing operation can be difficult to detect and locate. A change in the water/pipe temperature may give the appearance of a leak. If the temperature of the pipe/water decreases, the test pressure decreases and vice versa for a rise in pie/water temperature. To prevent unnecessary concerns in this respect, the effects of temperature change on pressure can and will be pre-determined so that the integrity of the pipeline can be confirmed during the testing period.

On completion of the 'hold' period and successful acceptance of the test the water is removed from the pipeline by swabbing pigs propelled by dry/oil free compressed air. The water will either be sent an approved disposal site (evaporation pond/lagoon or river depending on water quality and chemical composition) or into the next test section via solid cross-over piping.

On completion of the initial de-watering, additional pigging runs will be carried out using a combination of swabbing and foam pigs to remove as much free water as possible from the pipeline. This sequence will continue with all other test sections.

Once the dryness of two adjacent sections has been accepted, these sections will be tied-in by welding a short section of linepipe between them to form a complete pipeline between permanent pig trap sites.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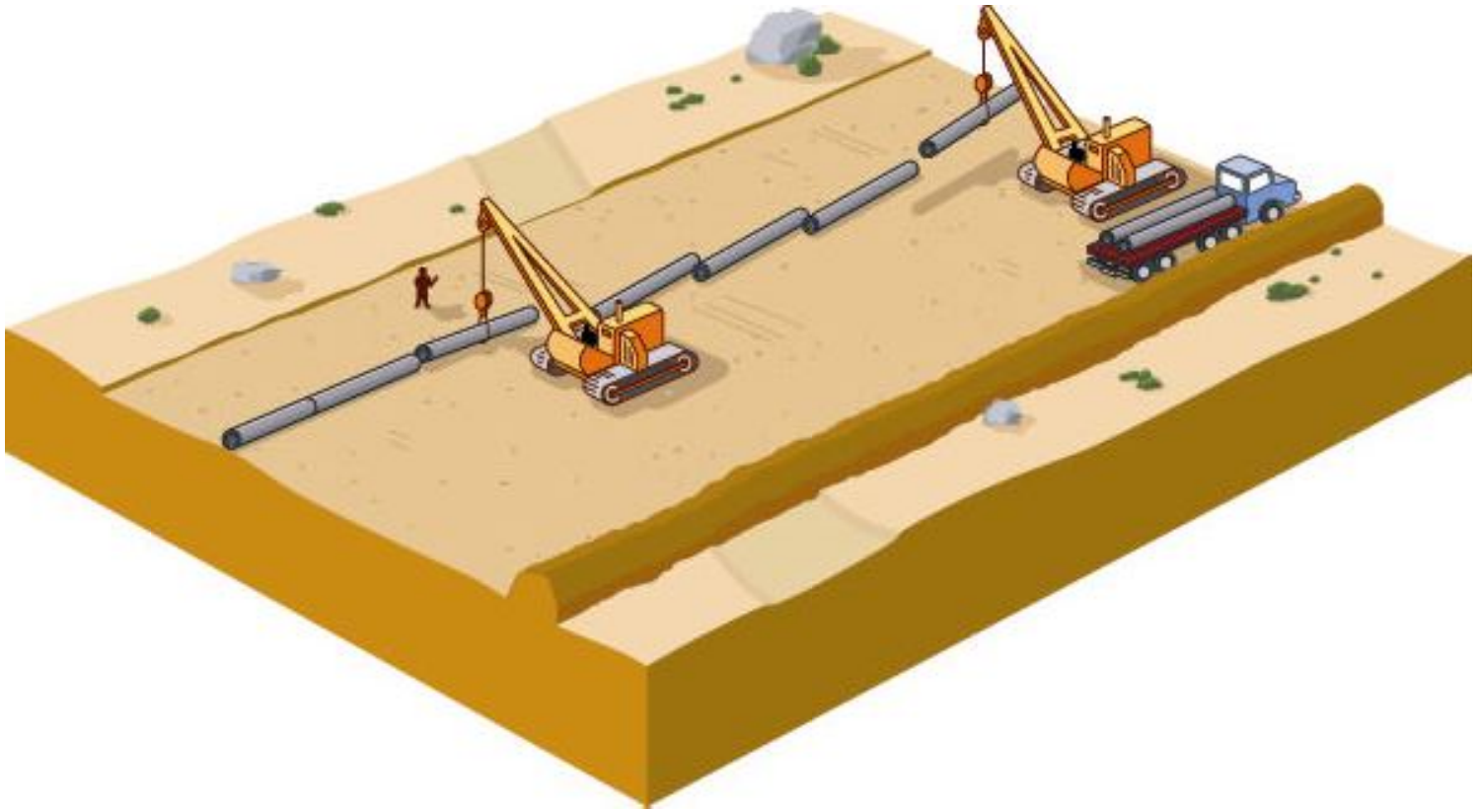

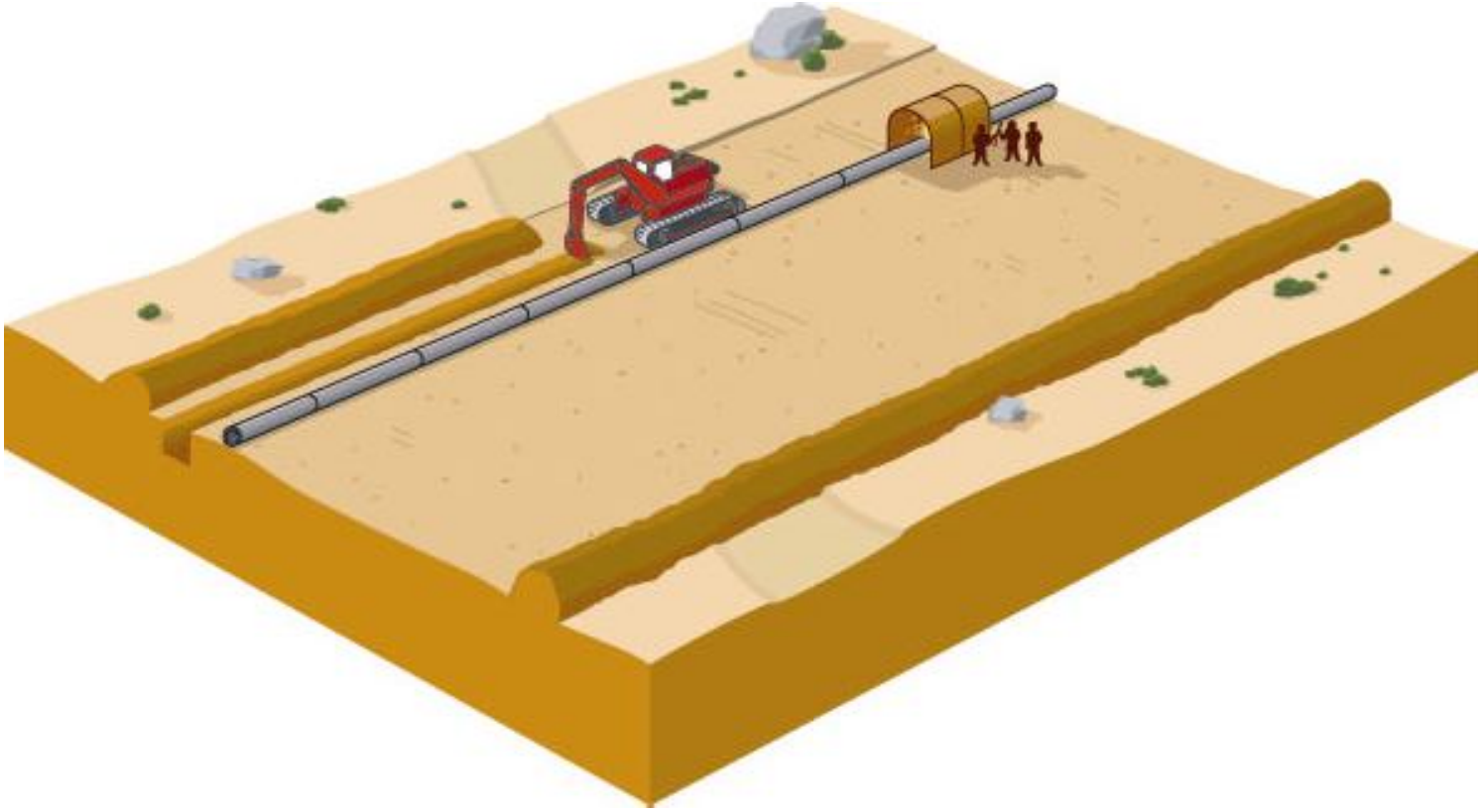

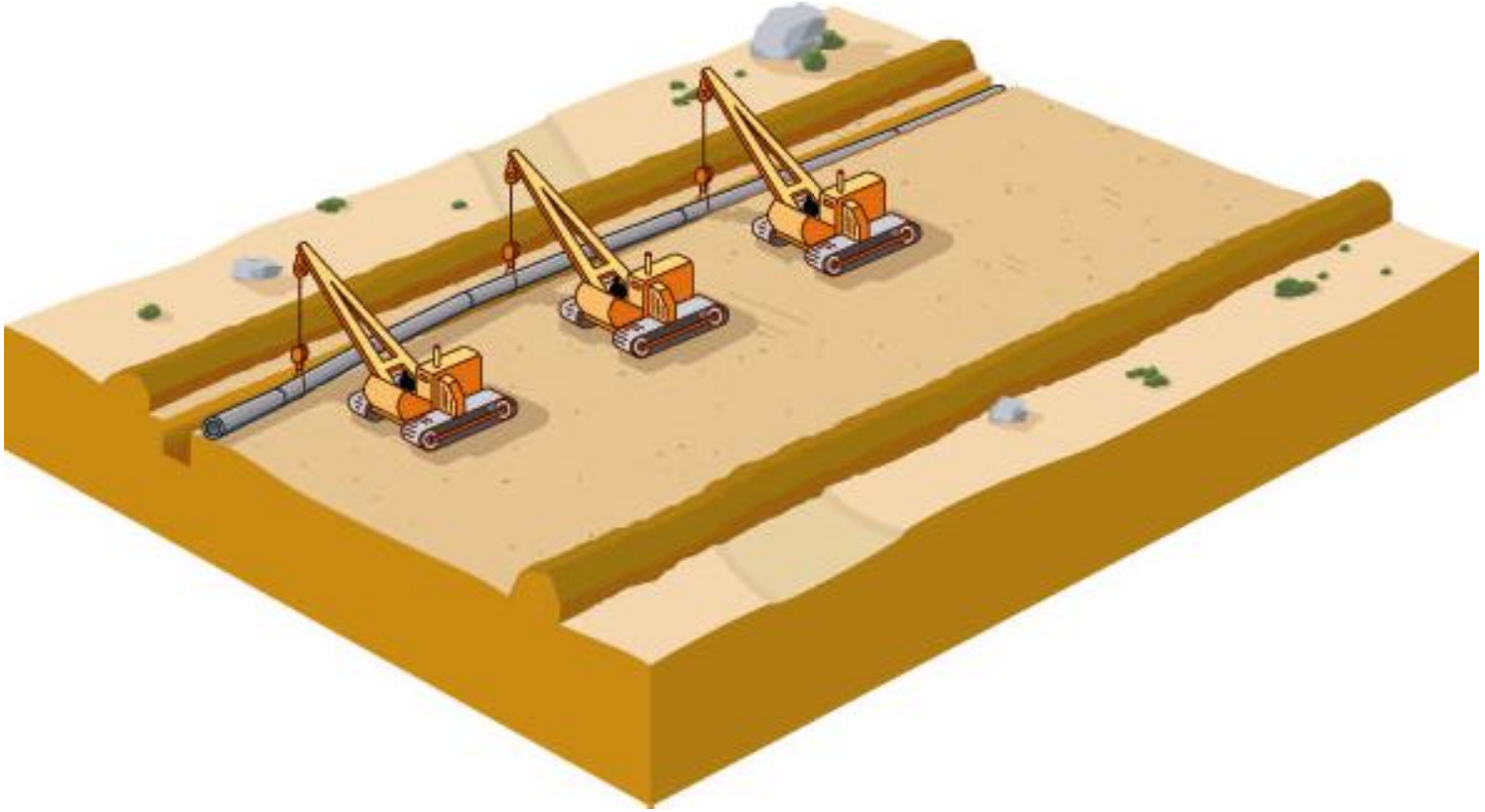

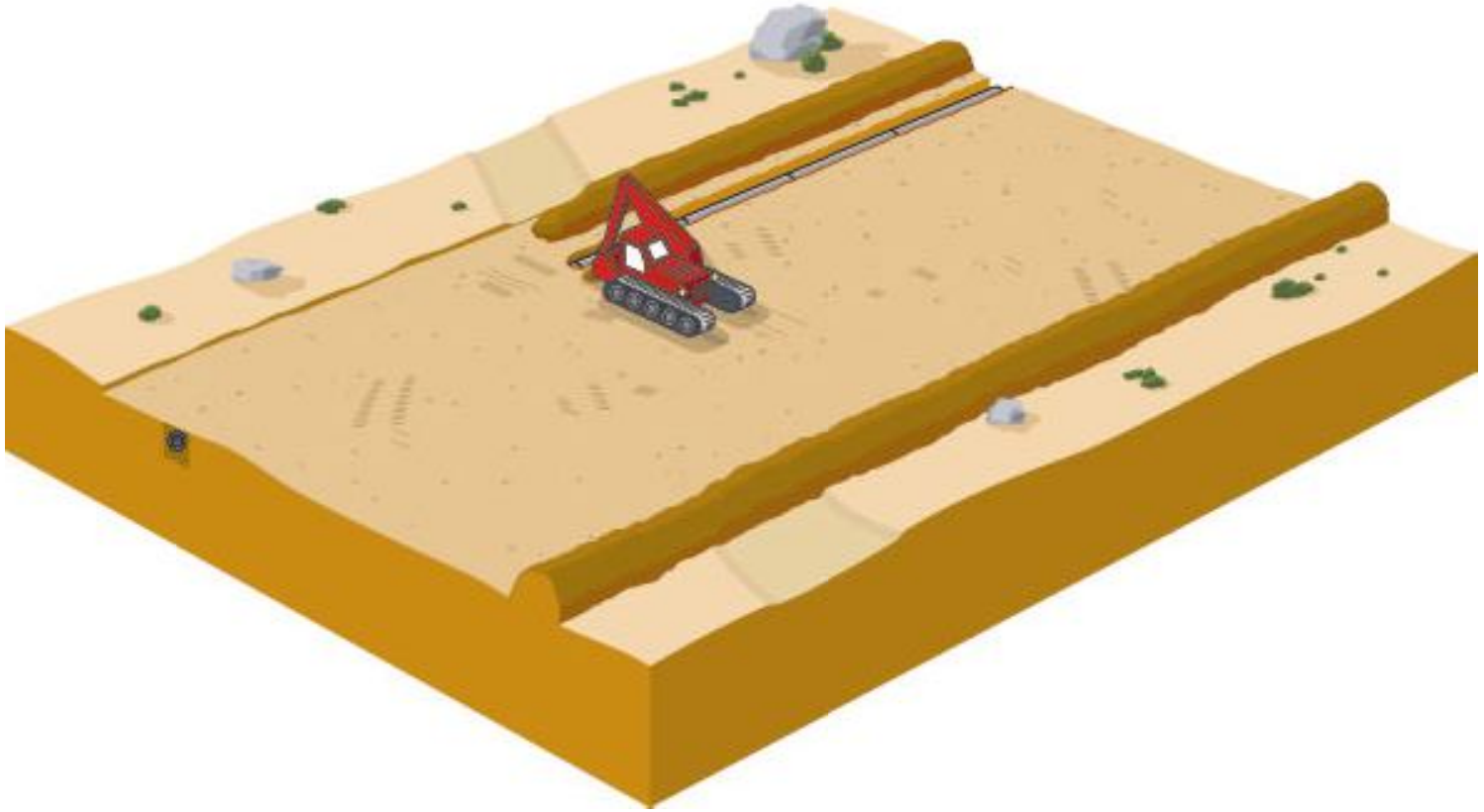

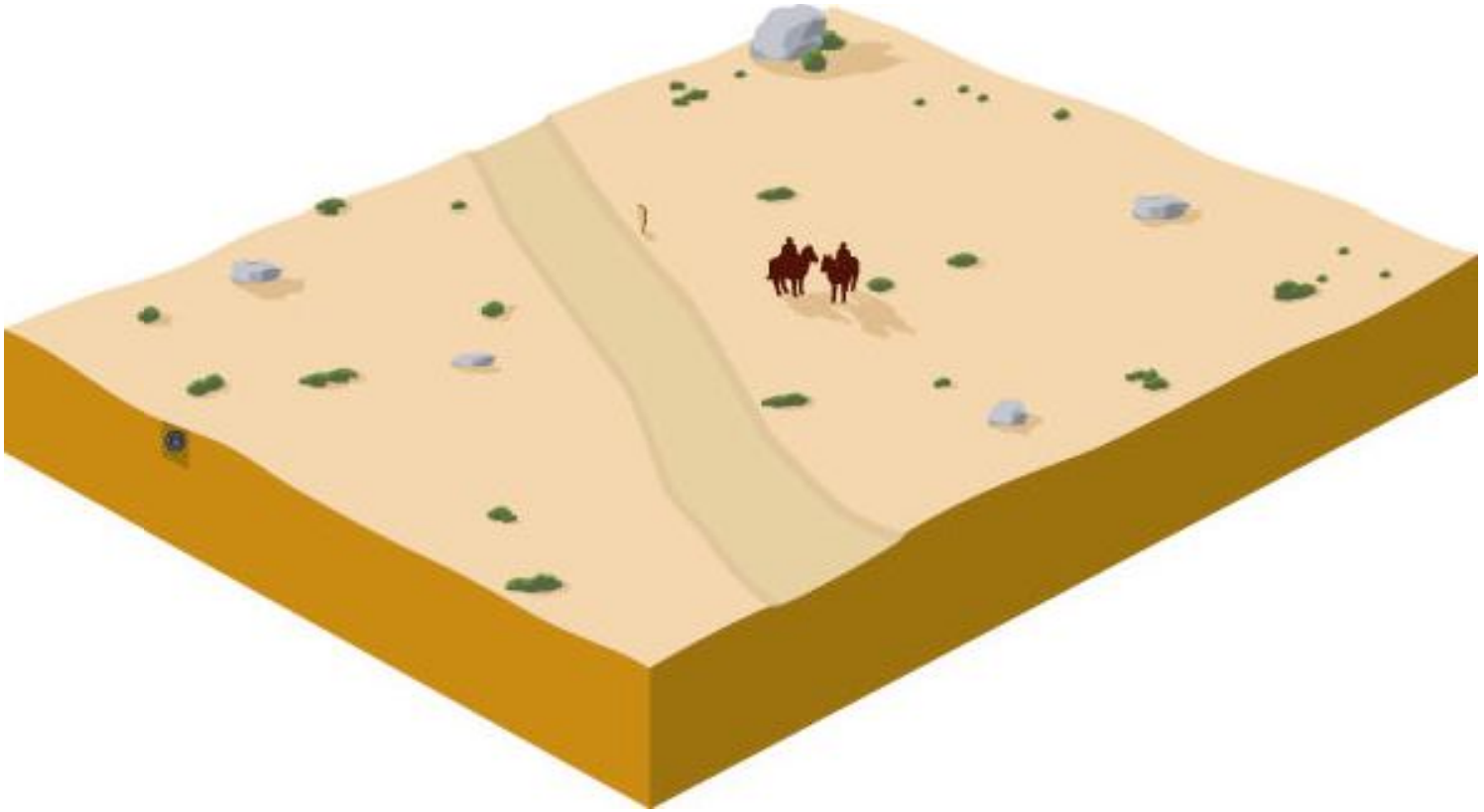

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Every effort has been made to ensure the quality of translation is technically correct. However, where discrepanices betwen the various translated text occur, the english version is to be relied upon as the original and formal version.

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Signed by the Project Director,

Dr Jim Wright

Acknowledgement Page:

The key parties involved in the preparation of the ESIA are listed below.

List of participants and contributors

SPECIALIST CONSULTANTS	PROJECT ROLE
ERM	Socio-economic Impact Assessment
URS	Environmental Impact Assessment

However, many Georgian experts and consulting bodies were also heavily involved in the ESIA process. The major institutions involved is summarised below. A full list is given in Section 17 of the report.

Summary of Georgian Institutions Consulted

Dzelkva
Institute of Botany
Tbilisi Central Botanical Garden
Noah's Arc Centre for recovery of Endangered Species
Institute of Zoology
Georgia's Protected Areas Program
Department of Melioration and Water Resources Management
Georgian Politechnical University
State Department of Geology
Ministry of Environment and Natural Resources Protection
Gorbi
IPM
Centre for Archaeological Studies
State Department for Protection of Monuments