



THE REPUBLIC OF ALBANIA
**THE MINISTRY OF PUBLIC WORKS,
TRANSPORT AND TELECOMMUNICATIONS**
GENERAL ROADS DIRECTORATE

**ENVIRONMENTAL
IMPACT
ASSESSMENT REPORT**

EXECUTIVE SUMMARY

NORTH- SOUTH CORRIDOR
LEVAN TO VLORA ROAD SECTION

FEBRUARY 2007

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1. EXECUTIVE SUMMARY

1.1. INTRODUCTION AND BACKGROUND

This section provides an Executive Summary of the Environmental Impact Assessment (EIA) for the proposed EBRD financed Levan-Vlora road project (the Project) which consists of construction of a new highway from Levan to Vlora crossing the River Vjosa valley and along the edge of the Narta Lagoon. The document can be used as a stand-alone for the EIA Non-Technical Summary.

The document provides a general summary of the findings in the following Project Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP), including legal and policy framework and applicable environmental standards, environmental baseline information, potential adverse impacts to the physical, ecological and socio-economic environments in the Project area, analysis of alternatives, mitigation measures, public consultation programmes, and environmental management plan for the Project.

The EIA has been prepared considering the EU Council Directive of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (85/337/EEC) and Council Directive 97/11/EC of 3 March 1997 amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment. These directives are also conveyed and adopted in the Albanian Law (Environmental Impact Assessment Nr. 8990, dated 23.01.2003). It should also be noted that since the Ministry of Public Works, Transport and Telecommunications, has asked the European Bank for Reconstruction and Development (EBRD) to participate in the sponsoring of the project, the EIA has been restructured in order to comply to all the EBRD's requirements.

1.2. LEGISLATION RELATING TO ENVIRONMENTAL IMPACT ASSESSMENTS

- During the last decade the government began developing a framework to reverse the environmental degradation that had arisen from previous industrialisation under the socialist regime, which neglected the protection of the environment almost entirely. Environmental management and protection is clearly part of the Constitution that requires the Republic to:

- *"maintain a healthy and ecologically suitable environment for the present and future generations"*.

- The legislation governing environmental protection is being strengthened relatively rapidly in Albania. The first Law on Environmental Protection was enacted in 1993 and amended in 1998 and 2001. That law states in Chapter II, Environmental Impact Assessment, Article 7 that:

- *"all the activities of natural and legal persons, native or foreign, who exercise their activities in the territory of the Republic of Albania, shall be subject to environmental impact assessments"*.

- More recently Law No. 8934 on Environmental Protection states that environmental protection is the obligation of all states, judiciary and individuals with activities in Albania. Article 34 requires any person or state organisation to obtain permission from the responsible bodies (MEFWA) in order to carry out any specific works in Albania that has an impact on the environment. In order to obtain this permission an environment impact assessment is to be conducted.

- Until recently there has been no legally defined process for the development of EIAs. A law on Environmental Impact Assessment was drafted in 1995 that hitherto was never adopted by GoA. This draft law has been used on occasion as the guideline on EIA procedures in Albania. However, Law No. 8990 on Environmental Impact Assessment was passed on 3/01/2003 and now defines all the procedures for the preparation and submission for approval of EIAs in Albania. The law also defines what level of EIA has to be conducted for the various types of development.

- Law No.8990 aims to secure to provide:

- a) A general integrated estimation of environmental impacts of the projects or activities which will be realised thus preventing and attenuating the negative effects on the environment in time.
- b) An impartial and administrating evaluation process with the participation of central and local institutions, public institutions and non-profit organisations for the environment, project promoter, environmental specialists and juridical people specialised in environmental issues.

- For this project, article 26 of law no.8990 requires public participation in the process of Environmental Impact Assessment in line with the requirements of the new environmental legislation and the relevant EU directives.

The most important regulations and laws applied to the EIA are as follows:

- Law Nr. 8934 “On the Environment protection”;
- Law Nr. 8990 “On Environmental Assessment Studies”;
- Law Nr. 8093 “On the water resources” from the year 1996 improved by the Laws Nr. 8375, 8605, 8736;
- Law Nr. 8897 “On the protection of the air from pollution”;
- Law Nr. 8561 “On the resettlement and temporary use of property for public interest”;
- Law Nr.7623 “On forests and their protection” from the year 1992 changed by articles 63 and 64 from Law Nr. 7839 “On the exploiting of forests”; and
- Law Nr. 7866 “On the Referenda” which includes specific environmental issues.

1.3. ALTERNATIVE ROUTES CONSIDERED

During the Conceptual Study three alternatives were considered, including upgrading the existing road. Since the Levan to Vlora road scheme was developed as part of the Fier-Levan-Vlora road project, alternative alignments B, C and D have been used for the adjacent ‘Fier-Levan’ road section.

Initially the study considered whether it was feasible to adopt an alternative route that completely avoided the Vjose-Narta Protected Area. However a study of the area indicates that the protected area extends approximately three to four kilometres to the east of the existing road alignment in order to include the catchment area of the waters that feed the Narta Lagoon. Hence the existing road and railway alignments are located well within the protected area. This eastern area of the protected zone contains many habited areas consisting of small towns and villages. Additionally the land elevation is rising to the east. Thus the terrain to the east, and outside the Protected Area, is considerably higher and undulating, making it much more difficult and expensive to construct a road alignment through this area and would have greater impact on the human population. Finally any alternative road alignment considered to the east would have to enter within the protected area at the south-eastern corner of the protected area in order to link up with the existing roads which enter the city of Vlora. In view of this, alternative routes to the east and totally outside the protected area were not considered to be viable alternatives.

The conceptual design thus engaged in considering whether the existing road “Do-Minimum Option” could be rehabilitated and upgraded to provide the solution to minimising the impact on the Vjosa-Narta Protected Area. But as stated above, even the existing road lies within the designated area. The “Do-Minimum” option would continue to utilise the existing road, which involves the route passing through the urban areas of Levan, Novosela, Mifoli, Panaja and Vlora, with long-distance through traffic having to share the road with the local traffic. This has a negative impact on the public health from a noise and air pollution perspective.

The predicted increase in the rate of accidents constitutes an unfavourable factor when considering the use of the existing road for the proposed national route, since the existing road has a poor geometrical alignment by normal standards and also from a safety aspect.

The intention to widen and realign the existing road, would result in a substantial impact during the construction phase of the work and would not solve the problem of long-distance traffic passing through the urban centres and the imposition upon the large important oil pipelines at the exit of the valley of Levan. In addition the corridor through which the existing road passes is incompatible with the required geometric standards of a national highway.

Since the “Do-Minimum” option was not considered to be the most ideal solution, two alternative alignments within the protected area were identified and assessed to establish their impact upon the protected area and to determine whether their intrusion into the protected area could be minimised and mitigated against.

Alternative A

The route of Alternative A diverts from the existing road passing along a new corridor across areas of level land with a limited number of residents.

One of the environmental aspects of the alternative route is within the sensitive area of the River Vjosa valley where the route would traverse a lowland area. Such impact would be resolved by constructing the route on a viaduct, which would avoid creating an obstruction to the natural flow of the water.

The landscape crossed by this alternative route doesn't generally contain elements of environmental value, or historical-architectural sites, since most the land traversed is under agricultural use or used for the salt production industry. The one exception is near the southern end where the route runs close to the Narta Lagoon. However even at this location the route doesn't actually directly affect the lagoon, but once again traverses agricultural land. On the other hand the alternative route passes parallel to the railway line over a long length, occupying the same infrastructure corridor and so minimising the impact on the landscape. Also at the southern end of the route, the impact of the new road on the panoramic views is minimised due to the fact that Alternative A is positioned on the hillside rather than in the valley where it would be more visible.

To the east of Skrofotina, Alternative A passes along the eastern edge of the salt flats. But since this area is already industrialised the impact of the alternative route upon the area can be reduced through a rationalization of the local roads using underpasses and roundabouts and through the creation of a new access into the industrial establishment.

Regarding noise and air pollution, the alternative route has a beneficial impact on human inhabitants since it avoids all the urban areas and it removes the long-distance through traffic from those areas and improves the flow of traffic.

One important point comparing the improvement and upgrading of the existing road (Do-Minimum option) with Alternative A is that the alternative route can be constructed without affecting the existing traffic flow. Secondly Alternative A has a much lower impact regarding noise and air quality on the human population because the alternative affects much less properties and persons.

Concerning the impact of this alternative route upon the fauna inhabiting or visiting the protected area it has to be stated that the impact is considered to be relatively low. The reasons for this are that firstly the alignment of the alternative route is not so different to the existing road and railway alignment and therefore can be considered to be located close to the developed areas. Secondly the most sensitive regions of the protected area are on the western edge close to the Adriatic Sea where the visiting wildfowl have their nesting sites. These regions are between seven and nine kilometres from the route of the considered Alternative and therefore of sufficient distance to be unaffected directly by the road. With regards to noise intrusion, since the Narta Lagoon is a particularly sensitive area, noise levels have been modelled for the predicted traffic volumes for both the day and night scenarios. Between Skrofotina and Narta, where Alternative A is closest to the lagoon, the assessed noise levels generated from the road traffic at the edge of the lagoon are between 40 and 44 dB(A) during the day and between 37 and 40 dB(A) during the night. Since these noise levels are indicated to be very low, then the wildlife in the Narta Lagoon area should not experience any noticeable change in noise levels after the road is constructed.

Alternative E

The continuing use of the existing road section between Levan and Ferrasi for Alternative E introduces a similar problem to that for the "Do-Minimum" option. That is during the construction phase, improvement and upgrading of the existing road will lead to traffic disruption.

Another element of impact can be foreseen where the alternative route passes through the inhabited area of the village of Fitorja.

In comparison to Alternative A, this alternative minimizes the interference with the area of the salt flats, because Alternative E is located further to the east, but this alignment produces a substantial increase in the quantity of necessary structures. Alternative E requires two bridges over existing roads and three bridges over the railway line in the Mifoli-Vlora section which would create a notable increase in impact on the landscape and an increase in the work's construction costs.

At the southern end of the alignment where Alternative E is coincident with Alternative A obviously it would have the same environmental impacts as for Alternative A described above. Hence the two routes have a similar impact upon the Narta Lagoon.

Since all three of the alternatives are considered to be "Environmentally Acceptable", other factors have influenced the selection of the preferred route. The environmental impacts identified in all the alternatives considered are of a predominantly local and constrained character.

In conclusion it is considered better to discard the “Do-Minimum” option because it cannot fulfil the required technical, geometrical and safety characteristics. In addition the “Do-Minimum” option does not provide for the expected increase in the traffic flows. The improvement on-line of the existing road is also seen as difficult to construct, considering the development of the areas and the continuous presence of buildings and other installations along the route, as well as for the serious environmental effects that would be enforced on the public’s health and on the environment during the construction works.

For the Levan-Vlora section it is possible to conclude that Alternative E has a high construction cost and doesn’t resolve all the critical points (such as continuing to use the existing road for some sections, passing through the urban area of Fitorja and an impact on the landscape due to its elevation on five over-bridges). However Alternative A is the route which better resolves the environmental issues. This alternative route is better situated within the environmental context of the area and thus minimizes the environmental and economic impacts.

The predicted impacts are in fact, to a large extent, mitigated through technical solutions already contained in the project (constructed on viaduct in the areas of the flooding, etc.) and also through normal mitigation measures (such as landscaping, adequate drainage connections, careful avoidance of land severance, etc.). Alternative A reduces the barrier effect on the area by careful reconnection of the intersected local roads, through provision of secondary roads, underpasses, roundabouts etc. which drastically reduces the phenomenon of uncontrolled crossing (currently a cause of numerous accidents). Alternative A also avoids the unsafe mix of long-distance traffic with local traffic.

The intrusion within the boundary of the protected area of Narta Lagoon is common to all the alternatives, including the “Do-Minimum” option. The intrusion is nevertheless marginal in respect to the principal objective values of protection and maintenance of the lagoon, such that the lagoon won't suffer changes and noticeable alterations to the protected area.

This has led to Alternative A being adopted as the “selected option”.

1.4. TECHNICAL ASPECTS OF THE SCHEME

The Levan - Vlore project is part of the Fier - Vlora project designed by “Sintagma” an Italian company. The 24 km route commences at Km 19+600 at a roundabout south of Levan village, 500 m west of the existing road, and it ends at a roundabout at Km 43+500 close to the city of Vlora on the existing road between Narta and Vlora. This road is proposed to be a dual 2-lane carriageway with two lanes each 3.75m wide in both directions.

Starting from Levan, until crossing the River Vjosa, the proposed road sweeps around Ferrasi, bypassing the village to the west, and enters the river floodplain. The project intersects the local road going to the village of Qarr at Km 21+ 300 and a bridge is planned to be built to separate the two roads. The length of the bridge is 385 m and it will overpass the local road and a wide tract of land prone to flooding. However a connection will be provided to the existing road, from the roundabout at Levan, to ensure continuation of traffic connecting the existing local road with the proposed highway. The roundabout at Levan will also provide a connection with the existing Fier - Vlora road through a link near the train station. Throughout the scheme, the proposed road crosses private property belonging to farmers, which according to Law Nr. 7501 is classified as agricultural land.

The River Vjosa is crossed at Km 22+60 on the west side of the forest and a new 130 m long bridge is proposed to be built. Then the proposed road continues bypassing the villages of Bishani and Fitorja first to the east and the second to the west.

At Km 28+360, between the villages of Novosela and Alibani, another roundabout is being built to provide continuation of access to the villages and to the existing road to the east. Two underpasses are scheduled to be built for the existing roads to the villages at Km 24+890 and 25+950.

The project continues from the roundabout at Novosela to the roundabout close to Panaja at Km 35+224. At Km 29+930 another underpass will be provided for the local road to pass under the proposed road. The proposed road along this section crosses more agricultural land in ownership of the local farmers. The geometry of the road in this segment also has some large radius curves.

From Km 35+250 to the roundabout at Vlora (Km 43+519), the road passes over the railway line north of Narta at Km 40+372. Several underpasses are proposed along this section of the road at the locations where the new road crosses the local ones. These are scheduled at Km 37+050, 40+410, 40+620 and 42+270. In the Narta area, the proposed road crosses a considerable area of land planted

with olive trees. The road passes to the west of the village of Panaja and to the east of the village Narta.

The final proposed roundabout, north of Vlora, is only one kilometre from the existing national road. The proposed road project will provide for continuation of all the water channels which are intersected by the project through the provision of adequately sized culverts. On both sides of the road embankment, the project provides drainage ditches to drain the surface water and protect the road.

1.5. THE EXISTING ENVIRONMENT

1.5.1. ARCHAEOLOGY AND CULTURAL HERITAGE

The important archaeological sites in the area are at an adequate distance from the proposed road, such that they will be unaffected by it. The most well-known sites of historical or archaeological value are St. Marie Church Treporti, Spinarica and the Vjosa river valley.

St. Marie Church

The church is located on Zverneci Island, in the southern part of the Narta lagoon. It is a Cultural Monument dating from the 13th Century. The church is well known for its wall paintings (fresco) as well as wood carvings depicting flowers and several animals. The church is nowadays restored and used as a cult place. Festivities are organized every 15th of August.

Treporti

Treporti is located in the west of the Narta lagoon, near to Zverneci village. Archaeological excavations have shown that the site has ancient buildings dating from the Greek-Roman period. Treporti has been an important harbour linking the city with other important ancient cities such as Aulona, Apollonia, Oriku and Amantia.

Spinarica

According to documents dated in the 12th Century, Spinarica was one of the medieval cities on the Adriatic Sea. It was located near Narta lagoon, in the outlet of the Vjosa River. Spinarica was an important trading post especially for wheat, stock breeding, wood and iron. After the 15th Century, the city lost its importance and is no more mentioned in historical records. The remains of the city are still not discovered due to the natural changes of the coastal area.

The Vjosa River Valley

The Vjosa river valley has been an important communication route for the human population since early prehistoric times and has continued to be as such until quite recently. It has been particularly important for the connection of the Albanian coastal area with the inland territories. It has also provided many suitable locations for human settlement and for this reason it is potentially a rich archaeological area. The archaeological research and investigations to date have already produced a rich amount of archaeological information including many sites and isolated finds.

1.5.2. LANDSCAPE AND VISUAL AMENITIES

The landscape along the alignment of the Levan - Vlora road is characterised by a widespread combination of olive groves and shrubs along the hillsides and mixed agriculture, planted or abandoned on the flat plain. A specific habitat in the area is that of the salt marshes with the salt flats, channels and the salt hills near the old railway.

The river Vjosa and the Narta lagoon define the overall distinctiveness of the landscape along the Levan – Vlora road. The River Vjosa valley itself is very wide and hosts a number of interesting landscape features, including several delta-like channels for the river during periods with low volumes, riverine shrub and the seasonally inundated river valley margins.

Vjosa valley is picturesque and the small towns hidden within the olive groves have a particular attraction in the overall landscape of the area. The route provides very scenic vistas, which contribute to a pleasant journey ambience for travellers. The landscape near to the settlements has been degraded by poor waste management, including illegal dumping of waste at the roadside and the deterioration of agricultural activities.

1.5.3. CLIMATE

Based on the categorisation of the climate of Albania, the proposed road lies in the Central Low Mediterranean area that covers almost all the low coastal part of Albania. It is characterised by hot and dry summers and cool and moist winters. The annual average amount of rainfall is from 950 to 1,200 mm/year, much of which (70-80%) falls during the period October to March. The annual average temperature limits reach 15°-18° C. The highest temperatures are registered during the period June to August, with a maximum of 30°-35° C.

The lowest temperatures are reached during the month of January. They may go down to 6.5°-7.5° C. The difference between the temperatures during the day and the night is 6-7 degrees and in some cases even more. Snowfalls are almost absent or in rare cases they fall in very small amounts and thaw immediately.

1.5.4. RELIEF, GEOLOGY AND SOILS

Based on the physical-geographic compartmentalisation of Albania, the project area is part of the Western Plain. The project passes through an area ranging from 0m up to 246m above sea level. The Albanides (Mountains of Albania), based on litho logic and tectonic relationships, are divided in two main geologic sub-groups: Inner and Outer Albanides. Inner Albanides are dominated by ophiolitic nappes while the Outer Albanides are composed of four semi-parallel thrust zones: the Krasta – Cukali zone, the Kruja zone, the Ionian zone and the Sazani zone.

The Vjosa – Narta Wetland complex is located between the Ionian and Sazani zones. The coastal part Vlora to Poro is composed of quaternary marine sands and gravels of tertiary molasses (new sedimentations). The molasses were deposited in the Peri – Adriatic depressions, which overlie older carbonate sediments. Molasses also compose the central hilly part of the area. Molasses are composed of sandstones, siltstones, shales and marls.

Gypsum can be found in a small abandoned quarry near to Narta village. Quaternary marshy deposits of clayey silts and sand are found at the northern end of the Narta lagoon. Quaternary and recent alluvium is found in the River Vjosa. The western part of Vlora and the plain area bordering the Adriatic coast are part of the Narta syncline, while the eastern hilly area is part of the Trevlazeri anticline. The Narta syncline is composed by the Neocene and Quaternary deposits. In general the Neocene deposits consist of clay, mudstone, sandstone and conglomerates.

The area is made of grey brown salty land. Such types of land are formed usually on alluvial deposits, lakes, seas and sedimentation areas, usually in a flat relief.

1.5.5. HYDROLOGY, SURFACE AND GROUND WATER

Narta lagoon is situated to the north of Vlora Bay with a water surface area of approximately 42 km² bordered in the south and southwest by the picturesque hills of Zverneci. 20% of the lagoon area is used for salt production. The lagoon lies in the Mediterranean field climatic sub-area.

The water in Narta Lagoon has high mineralization, due to the low water exchange with the sea and high levels of evaporation. The annual rate of change of the salinity in the lagoon follows the rate of evaporation and atmospheric precipitation. During the summer period the salinity reaches high values (up to 78.57 ‰) due to the high evaporation, little rainfall and low water exchange with the sea. The opposite happens during the winter period. High rainfalls and low evaporation causes the salinity level to drop to 36.10‰.

The regime of water level in the lagoon is mainly determined by the regime of atmospheric precipitation and evaporation. Regarding the water exchange process, this is low due to the small dimensions of the communication canals. Tidal effect is almost zero, although during the driest period of the year, the water supplied from the sea into the lagoon, although in small quantities, secures its existence.

It is important to mention that the wind regime also influences the water level regime in the lagoon. The strong southern winds cause a decrease of the level by 20-25 cm, while the northern winds cause an increase by 15-20 cm. Wind influence on the water level is particularly considerable due to the shallow depth of the lagoon.

The main drainage in the area is due to the River Vjosa, which is one of the main rivers in Albania and which flows into the Adriatic Sea. Vjosa is the biggest river in Southern Albania and one of the biggest in the country. The total watershed area of this river covers about 6,710 km², out of which 4,365 km² are within the territory of Albania, while the remainder is in Greece.

The River Vjosa springs from the Pindus Mountains in Greece. In Albanian territory, up to Dragoti, the river passes through a narrow valley, accompanied with low terraces on both shores. After Dragoti, the valley widens, except for the narrows in Kalivac and Kute. In the flat area, the riverbed is wide and very winding. The river mouth is in the Adriatic Sea, near Poro village, north of Narta Lagoon.

The annual water-flow regime of River Vjosa is determined from a combination of the climatic factors and the physical and geographical features of the territory. From the climatic factors, the precipitation influences directly the distribution and the amount of water-flow, while the influence of the physical and geographical features of the territory is mainly important in the precipitation and evaporation regime. In the River Vjosa watershed the main precipitations are rainfalls. However snowfalls, noticed in the higher part of the watershed, are especially important for increasing the underground water reserves that feed the superficial flow, especially during the dry period of the year.

All the agricultural land is covered by a dense network of irrigation ditches. But most of them today are damaged and as a result only a small part of land is under irrigation.

The area has three hydro pumping stations and some ditches with gravity drainage. The drainage system is not functioning properly because of siltation of the ditches, pump malfunctioning, power shortages, etc. Following heavy rainfalls, the main portion of agricultural land is flooded for several weeks.

The area is generally poor in groundwater resources. Groundwater does accumulate in the shallow sandy deposits. However this water is typically of poor quality and low volume. Nevertheless groundwater is occasionally extracted using hand-dug wells. The depth of the groundwater level varies from 1 to 10 metres. The primary groundwater flow is west towards the Adriatic Sea.

1.5.6. HABITAT AND BIODIVERSITY

The territory where the new road infrastructure will be constructed includes the Vjosa-Narta Landscape Protected Area, which includes not only the wetland sites but also the hill range that serves a catchment basin. The Narta lagoon and its catchments have the status 'Landscape/Seascape Protected Area' Category V according to IUCN in 2004. Narta Lagoon is the most important surface water area after the Lagoon of Karavasta.

Wetland habitats occupy 52 % of the total surface of Narta. The other main habitat (circa 40%) is agricultural land. Forests compose the third main habitat covering only 6% of the territory. The core wetland is Narta lagoon, a shallow marshland of 2,900 hectares surrounded by hills in the southern

and western part, salinas (saltflats) and agricultural land in the north, and two shallow wetlands in the north-west.

Different ecological units within the studied area show signs of ecological deterioration. Narta lagoon suffers from putrefaction, pollution from industrial and urban activities, over fishing, over hunting, water imbalance, absence of fresh water entrances etc. Kallenga and Limopua suffer from uncontrolled interferences in relation to the seawater entrance.

Dune systems are facing degradation and destruction from sand extractors. Agricultural land is in need of an appropriate irrigation and drainage system while the salt marshes suffer from the absence of key investments related to sea water entrances, water balance and dyke erosion.

Vjosa-Narta wetland complex is an important area well known for its special flora and the diversity of habitats. All these plant species make up a great national asset with economic and scientific values. Some plants are extremely rare, some others have scientific values and a good number of them compose widely used economic groups such as the medicinal, aromatic, industrial alimentary and decorative plants. The region of Vlora shelters some 1400 vascular plant species, representing 42% of the total flora of Albania.

The wetland complex of Vjosa-Narta is an important distribution area for a high number of animals including insects, fish, amphibians, reptiles, mammals and especially birds. According to former studies the wetland complex shelters at least 749 species of animals and invertebrates

Regarding national importance, Narta is listed as the second most important area in Albania for water birds after Karavasta. During winter in Narta more than 23% of the water birds seek shelter. As for the international importance the area satisfies Ramsar criteria (Wetlands of International Importance) for the total number of wintering water birds with more than 48,700 individuals. For four species Narta has more than 1% of the regional population Widgeon (*Anas penelope*), Black-winged Stilt (*Himantopus himantopus*), Snowy Plover (*Charadrius alexandrinus*) and Little Tern (*Sterna albifrons*).

The greatest number of birds in the area (nearly 91% of them) stays in the lagoon's waters. Ducks and Coots (*Anatidae & Rallidae*) are the most present species representing respectively 47% (18,000 individuals) and 35% (13,500 individuals) of the total number of birds. The nesting and breeding season registers a big number of nesting birds which varies from 650-850 pairs. The main nesting birds are the Sea Terns and the Waders (*Laridae & Scolopacidea*).

The number of rare fowl species in Narta lagoon is 31, valuable species are 93, endangered species are 7 (globally endangered such as: the Dalmatian Pelican (*Pelicanus crispus*), Hawk (*Falco naumanni*), Pygmy Cormorant (*Phalacrocorax pygmeus*), White-tailed Eagle (*Haliaeetus albicilla*), the Big Eagle of Ducks (*Aquila clanga*), Ferruginous Duck (*Aythya nyroca*) and the White-headed Duck (*Oxyura leucocephala*).

Typical habitat for these creatures is found in the western part of the lagoon, while the road will pass in the eastern part. This eastern part is an area of stable development and the road construction is not a threat for the habitat that is found in this area.

Up to now 32 species of mammals have been found. The Narta area contains nearly 53% of all species present in Albania, of which 11 belong to the list of globally threatened mammals. This demonstrates the national and international values of the protected area. Species worth mentioning are: the Eastern Hedgehog (*Erinaceus concolor*), Cape Hare (*Lepus capensis*), Red Fox (*Vulpes vulpes*), Least Weasel (*Mustela nivalis*) and the Bottle-nosed Dolphin (*Tursiops truncatus*).

Endangered species are: Mediterranean Horseshoe Bat (*Rhinolophus euryale*), Golden Jackal (*Canis aureus*), Common Otter (*Lutra lutra*), Eurasian Badger (*Meles meles*), European Polecat (*Mustela putorius*) and Short-beaked Saddleback Dolphin (*Delphinus delphis*).

1.5.7. AIR QUALITY

Emissions of air pollutants in Albania have fallen since the late 1980s and early 1990s. During that time the relative contributions from the different sources has also changed. Emissions from industrial production have fallen due to reduced industrial activity over the past 10-15 years. In the early 1990s household emissions also dropped for the same reason and because of the change from fossil fuels to electricity use. This trend seems to have continued throughout the 1990s. During the same period emissions from traffic have increased following a rapid growth in car ownership and use.

There are no available accurate results regarding the description of air quality in Albania for the project area, except some surveys undertaken by local authorities and individual studies carried out by study

centres or different programmes for monitoring of air quality in the main cities of the country including the capital, Tirana. Air pollution data are available for the two urban centres of Fier and Vlora. According to the data gathered, it can be concluded that the urban air quality in both Fier and Vlora cities have the same trend as in the other main cities of Albania. The main problem of air quality in cities is the pollution from particulate matter which surpasses the national and international standards in terms of SPM as well as for PM₁₀. The other indicators of air quality are within the allowable values established by National and International standards. According to the data collected by MEFWA, present concentrations of SO₂, NO₂, O₃ and Lead do not seem to breach any Albanian standards or WHO limits in any part of Albania.

However these results should be considered with caution as the measurements are limited in terms of geographical extent and methodology (the annual data completeness is only 16%, far below the WHO recommendations of 75%) and with regard to pollutant levels in other Eastern Europe countries' industrial areas and cities.

After the 90s, air pollution increased as a result of a significant increase in the number of vehicles for private use. However air quality is generally lowered by a road construction because vehicles emit more pollution whilst stationary or travelling more slowly. In Albania, fuel without lead is not yet available everywhere and vehicle maintenance is often not carried out according to the recommendations of the manufacturer. Therefore, emissions from vehicles contain considerable amounts of unburned fuel and special substances. Confrontation of these problems is a national issue that requires the application of standards and legislation and the GoA has increased taxation on leaded fuel to encourage more use of lead-free fuel, which will help reducing this impact.

1.5.8. NOISE

The World Health Organisation's definition of noise nuisance is 'A feeling of displeasure evoked by noise'. The nuisance caused by noise mainly affects people in their homes or when they are in the streets. However, areas of open space that are also used for recreational purposes can also suffer from noise pollution¹. One of the most significant impacts caused by traffic is noise exposure of people living in the settlements in the vicinity of a road alignment. Surveys in the EU reveal that a great part of the population feels annoyed from noise caused by road traffic. Noise is an undesirable or unwanted sound perceived subjectively by the individual. The physical level of noise does not directly correspond to the level of annoyance it causes. Noise impact assessment involves the concept of quantifying peoples' personal responses.

Noise associated with road traffic is generally considered to be at a more or less constant noise level, though this may not be a fair representation of noise generated by the current traffic along the road section under the project. The dominant sources of vehicular noise are usually tyres and exhaust. Other important noise sources are engines and transmissions. Actual levels of highway-generated noise will vary with traffic conditions and vehicle mix.

The customary unit for measuring noise is the decibel (dB). Decibels are expressed on a scale in which a perceived doubling of in noise level corresponds to an increase of about 10 decibels.

No background noise measurements were made during this study and no precise measurements are available for the proposed route. Since the route passes through a mainly rural area, the area is relatively quiet and the ambient noise level is considered low.

1.5.9. LOCAL COMMUNITY AND SOCIO-ECONOMICS

The project touches the villages of Levan, Novosela, Qender and the city of Vlora in the final 500 m. Levan village is part of the Fier region, while the Novosela and Qender villages are part of the Vlora region.

The area surrounding the proposed road is inhabited by a population of circa 40,000 inhabitants distributed in 9,257 families, with an average of 4-5 members per family. From the GRD's land survey, seven hundred and thirty four (734) properties/families are adversely affected by the project and will qualify for compensation for loss of land, buildings, residence etc.

The average number of inhabitants in settlements varies from 573 inhabitants in the village of Skrofotine to 3,693 inhabitants in the village of Narta. The population growth rate during 1989-1999 was about 13%. The average annual growth of 360 persons per year is one of the highest growth

¹ The Department of Transport, DMRB, Volume 11, Section 3 Part 7: Traffic Noise and Vibration. August 1994.

rates in Albania. The future trend foresees a further growth in the number of families and a reduction in the number of members per family.

The average household size of those interviewed is 4-5 members per household. A few families had 7-8 members. All the households interviewed were headed by married males. A significant minority (25%) of households included absent family members that sent remittances from abroad as they made a significant contribution to the household wealth in absentia. From the survey, the average age of householder is 36-40 years old.

Every village family has on average one cow, two sheep and some hens for their own family needs. Some of the villagers have started to establish small breeding farms for meat, milk, eggs and honey production. The main destination of the livestock production is the national trade market as well as subsistence use

The majority of households earn their living or livelihood by the land they own. Twenty-seven percent derive income for small to medium sized private businesses; while 11% work in the state sector. All of the respondents had land close to their family dwelling. Many families employ multiple livelihood strategies such as selling fruit from their fruit trees or fish from their fishing activities but were unable to calculate the amount of cash gained from these activities.

A small number of businesses interviewed earned a relatively good income from the business alone. But these people were in a minority, with the majority being totally dependent on their land for personal consumption and/or cash income. There is a correlation between dependency on land and age. For example, those who are most dependent on their land were generally above age 55, although some of this age group also receive remittances from family members working abroad.

The situation regarding employment in the area has followed the general social changes in Albania and especially in the Vlora region. The democratic changes after 1990 caused the destruction of former co-operatives, state farms and almost all state enterprises. Private sector provides 90% of the employment, while the public sector provides the remaining 10%. Agriculture and farming activities are the main source of income for most of the resident population. Other employment sectors include forestry, fishing, salt industry as well as the public sectors.

However in spite of the current local importance of agriculture and livestock breeding activities both are suffering from the absence of organised marketing, lack of transport infrastructure and low profile of the agricultural industry. The former suffers from a lack of services and absence of bank credit/loan systems for local farmers and the latter suffers from a low standard of veterinary services.

Today fishing employs 50-100 people. Fishing grounds include Narta lagoon, Limopua, former river of Vjosa and Kallenga lagoon, as well as the Vjosa River. Apart from legal licensed fishermen, the lagoon is used for fishing by about 30 illegal fishermen that do not pay any taxes to the state authorities. The fish are sold mainly to the restaurants of Vlora and Fier. A small part is used for family consumption.

Fish catches are considered as limited due to several factors, either human induced or natural. As stated before, Narta lagoon is suffering from hyper eutrophication which is the result of lack of communication with the sea, excessive water extraction from the salt flats, lack of fresh water entrances, entrance of sewage waters, entrance of industrial organic pollutants etc. Besides, illegal fishing is a common phenomenon. The mesh size of the fish net is often too small, thereby catching even young stock. Fishing is occurring even in forbidden areas such as Shamodura, on the north-western side of the Narta Lagoon. Large fishing boats fish illegally in very shallow coastal water areas destroying even the fish stocks preparing to enter into the lagoon.

Salt production started in 1958 and the salt flats actually cover an area of 1,472 ha. During the early years the salt flats produced about 25-30,000 tons/year and employed around 250 people, coming from the local villages and Vlora city. Salt production increased in 1970 with 70,000 tons and employing up to 800 persons. In 1975, the salt pans started to produce Iodic Salt with a capacity of 5,000 tons/year. A production peak of 140,000 tons was reached during 1975-1985. At that time the enterprise employed about 1,250 persons.

1.5.10. TRAFFIC AND ROAD SAFETY

Domestic traffic demand is formed by the flows generated and attracted from the transport zones internal to Albania. International demand includes the flows generated by internal zones and attracted to foreign countries (exports or outgoing visitors) and by flows generated by foreign

countries and attracted by Albania (imports or incoming visitors). Transit traffic demand consists of flows of freight and passengers generated and attracted by foreign countries that travel through the Albanian network. Different methodologies are used for estimating and projecting the demand on segments over a 20 year period.

International demand of freight is related to foreign trade development with existing and potential foreign partners. An analysis of foreign trade has been carried out establishing the global relationship between GDP and merchandise foreign trade. Merchandise foreign trade shares to GDP have been established over time in order to project total imports and exports in value.

Surveys were made of the existing traffic flows along the Levan to Vlora road section and forecasts made for future traffic demands for the proposed route. From the surveys during August 2002 and July 2006 it can be determined that the average daily traffic (ADT) flows in the summer months are much higher than in the remainder of the year. This is due to the fact that the Levan to Vlora road forms part of the coastal route between Fier and Saranda and therefore the route attracts a considerable amount of seasonal holiday traffic. The maximum seasonal ADT flow occurring on 31st July 2006, during the peak of the holiday season, reached 10,600 vehicles.

The collected survey data were used to project the annual average daily traffic (AADT) flows which indicate the daily flows averaged throughout the year. The projected AADT flows are then used for determining the road design and during the economical analysis of the road scheme.

Road Safety: Road accidents are the second worst health problem in Albania, and the situation is worsening due to the rapidly increasing traffic. International funding organisations are investing large sums of money on road construction and maintenance. However it is estimated that this investment will, even with the best intentions, contribute to an increased number of serious accidents mainly because of increased vehicle speeds as the roads are improved combined with a large number of relatively inexperienced drivers.

Official fatality rates in Albania are widely estimated to be under-reported and yet are already recognised to be amongst the highest across European countries. The issue of road safety and the need for adequate road maintenance is a significant priority particularly in the light of official statistics which indicate levels of road traffic to be increasing at a rate of over 10% per annum. The economic rationale underlying the road safety project is provided by the fact that traffic accidents cost Albania approximately 1–3 % of its GDP.

A project providing technical assistance to the Directorate of Road Safety and Traffic, has just been completed by the Swedish Consultant 'SweRoad'. The project objective was to address the technical issues of road safety with the aim of reducing the number of traffic accidents. Importantly, the project has begun to address the lack of institutional capacity identified by the Government's own Action Plan for Road Safety, particularly in the implementation of road and vehicle safety legislation. It is now important that this foundation for safer roads is now built upon in future projects and by the Government of Albania.

1.6. SIGNIFICANT ENVIRONMENTAL IMPACTS

1.6.1. ARCHAEOLOGY AND CULTURAL HERITAGE

It is evident from the studies that the proposed road will not have a significant impact upon historical, cultural or archaeological sites because of the distance between the proposed route and the sites of archaeological interest, which is between 3.5 and 4 km. The monuments of cultural heritage are at a sufficient distance from the proposed road and therefore specific protection measures are not required.

Similarly the location where the proposed road crosses the River Vjosa floodplain is not identified as a site expected to reveal archaeological finds. However if during the excavations some archaeological remains are found, works will immediately be stopped, no one will be allowed to move or remove any items and the local competent authority will be informed. The works will resume only after appropriate measures have been taken as requested by the appropriate authority and confirmation has been received from them that works can continue. During excavation in likely areas of archaeological significance and areas of archaeological potential a watching brief shall be undertaken by an official government or government approved archaeologist.

Archaeological monitoring of topsoil stripping or the removal of soil on the banks and on the beds of the remaining watercourses is proposed during the laying of culverts and during regrading or realignments. Monitoring, which will address the potential for encountering archaeology at the dyke

crossings will be carried out, where feasible within the expropriated corridor, at the commencement of construction. Where archaeological deposits are discovered, procedures mentioned in previous paragraph will be adopted.

1.6.2. LANDSCAPE AND VISUAL AMENITIES

Landscape and visual impacts will be most pronounced during the construction stage and in the short term thereafter as mitigation is not in place or is limited in its effectiveness. In general negative visual impact will arise from residential and other properties close to or adjoining the construction boundary. Visual impact will arise through visual disturbance and visual intrusion due to tree and hedgerow screening loss, alteration of ground levels and construction traffic. Properties in close proximity to embankments under construction may also experience visual obstruction.

The following construction stages have potential for landscape and visual impact:

- Tree and hedgerow removal;
- General construction disturbance;
- Construction of embankments and to a lesser degree cuttings;
- Construction of elevated structures such as bridges/viaducts;
- Re-alignment of local roads; and
- Impact on trees and woodland.

The road is passing mainly across agricultural land and therefore generally there are very few existing trees or woodland that will be destroyed by the project. However, in the section between Narta and Vlora, and near Panaja, the proposed scheme will cause the destruction of some olive groves and some vineyards.

Any road development, especially one set off-line and at a distance from similar major roads, has the potential for significant impact on the existing fabric and structure of the landscape. The road, by its very presence, results in landscape disturbance, landscape severance and alteration of the landscape character. In this regard, the ability of the landscape to absorb the development determines the overall impact of the scheme.

In considering the landscape impact it must be noted that in general the proposed route avoids elevated land, notable ridges, extensive woodlands, plantations and olive groves. The route generally follows the ordinarily improved agricultural and rural landscape, which is the basic fabric of the landscape for the entire study area. In spite of this the required elevation of the road to pass over the 385 m long Ferrasi Viaduct at Km 21+305 to Km 21+690 and again over the 130m long Vjoses Bridge at Km 22+600 to Km 22+730, to pass over a flood-prone area and the River Vjosa and its floodplain respectively, will cause a moderate visual impact in those two areas.

1.6.3. CLIMATE

The impact of the project on the climate of the area is not significant and therefore during both the construction and operation phases there will not be any requirement for mitigation measures.

1.6.4. RELIEF, GEOLOGY AND SOILS

The proposed scheme will not have any direct impact upon the relief or geology of the region.

In the area where the proposed road traverses the flat plain, the alluvial topsoil will have to be removed prior to commencement of the structural road embankment. However the removed topsoil will be re-used on the embankment and cutting slopes prior to grass-seeding and landscaping.

1.6.5. HYDROLOGY, SURFACE AND GROUND WATER

Stripping the surface topsoil material will increase groundwater vulnerability. The potential will exist for groundwater contamination from construction plant leakages and accidental spillages of vehicle fuels and oils, though the area is generally poor in groundwater resources. Groundwater does accumulate in the shallow sandy deposits. The depth of the groundwater level varies between 1-10m. However this water is typically of poor quality and low volume. Nonetheless, groundwater is occasionally extracted using hand-dug wells, but this is only used for irrigation purposes. Drinking water for households in the vicinity of the proposed road is extracted from bored wells higher up the River Vjosa valley and then treated at the Water Treatment Plant in Novosela before being pumped into the distribution pipe network. No important aquifers have been identified within the project area.

The primary surface water drainages in the project zone are the Vjosa River, which drains into the Adriatic Sea north of Narta Lagoon and the Shushica River, which is a tributary of the River Vjosa. Additionally an important part of the water resources of the area are the manmade waterworks (reservoirs, draining canals etc.) such as the water reserves of Frakulla e Vogel, as well as the Vjosa-Levan-Fier irrigation canal with a total length of 32 km and a watering capacity of 15,000 ha. A dense network of irrigation channels covers the whole agricultural land. But a number of them have been destroyed and only a small portion of land is actually under irrigation.

The proposed road will run almost entirely on embankment or on viaduct, except for the final open cut-section just before reaching Vlora. Therefore an inappropriate design of the road embankment would produce a barrier-effect upon the flow of both the River Vjosa – with which the viaducts and the approach embankments could interfere if incorrectly designed - and of its flood waters, in the area included between the river itself and the town of Levan.

A similar negative impact would potentially occur towards the minor network of drainage canals.

During construction the following potential impacts may occur:

- *on ground waters as a result of drilling and excavating for foundations or accidental spills of oil and fuel from construction vehicles and machines due to improper management of construction activities;*
- *on surface waters as a result of possible temporary interruptions of drainage canals or pollution due to improper management of construction sites.*
- *impact on fish stocks due to construction of bridges within rivers.*

There is no direct interference with the brackish waters at the end of the River Vjosa or with the waters of Narta Lagoon.

During operation of the road, impacts such as reduction of the flood plain area due to the presence of the road itself (prevalence of embankments) and erosion at the base of embankments and structures may occur.

Some pollution of surface waters and, to a lesser extent, ground waters may also occur as a result of accidental spills of products being transported on the road and pavement run-off of rainwater, especially during the first flush after a long dry spell, when accumulated tyre rubber and oil and fuel leakages are washed into the adjacent watercourses.

In addition, a number of existing watercourses are to be regraded as part of the drainage works for the proposed road. These are generally minor works, mostly to maintain existing ditches which have become overgrown and blocked by debris or in certain instances to carry local realignments at inlets and outlets to culverts. A number of smaller ditches along the Scheme are being rationalised i.e. where there are a number of small ditches close to each other they are being realigned to pass under the road through one crossing. This is generally being applied to small ditches which have been constructed to facilitate the drainage of agricultural land. (e.g. Vjosës Plain).

Following construction of the road, surface water collected by the carriageway drainage will be discharged into the streams along its length and in some instances to streams close to the proposed road.

1.6.6. HABITAT AND BIODIVERSITY

The greatest concern regarding impact upon habitat and biodiversity is the impact that the proposed road will have upon the Vjosa-Narta Landscape Protected Area. Therefore in order to put the impact of the road upon the lagoon into perspective, we have to look at the actual lagoon area. The main wetland area, excluding the saltflats, is approximately 8km in length and 7km in width. The proposed road does not actually encroach upon the wetland area but rather runs generally parallel with the lagoon at a distance between 1 and 2 km from it.

Nevertheless there are many possible sources of impact, which can arise both during the road construction and afterwards during its operation. These sources of impact have been considered during the development stages of the road project and wherever possible the potential for impact has been removed during the design process or where this isn't possible, other mitigation measures have been introduced to alleviate the impact. A summary of the potential impacts considered is provided in the following paragraphs.

Construction of the proposed route would lead to permanent loss of the land required for the road, which will lead to destruction of habitats, especially where the existing vegetation has to be removed.

This could potentially lead to migration of the animal populations due to disturbance and additionally could lead to the creation of new habitats for invasive species, which may add to the threat to the resident species. According to the Land Use map, the route of the proposed road, whilst passing through the Vjosa-Narta Protected Area, crosses mainly agricultural land and the remainder is the industrialised salt production area. So loss of valuable habitats is not considered to be a problem since the land area required for the road is permanently being disturbed by the agricultural farmers.

Careless location of the Contractor's construction camp and compound could also lead to destruction of natural habitats and to migration of the fauna population away from the area due to the disturbance. Additionally poor control of disposal of solid and liquid waste from the camp site, together with spillage or leakage of vehicle fuels and lubricants, could lead to pollution of soils, habitat degradation and damage or destruction of breeding sites for fish and other aquatic species.

Noise and vibration due to construction could lead to migration of the animal population due to the disturbance and to a reduction of breeding success in the vicinity of the road. However it should be noted that at a distance more than 300m from the edge of the proposed road, the varying effects of wind and temperature render forecasting of noise levels difficult in most circumstances. According to calculations the predicted noise levels in the vicinity of Panaja and Narta, which reflect the noise impact of the proposed road upon the Narta Lagoon area, reach a daytime maximum level of 47.7 dB(A). This is below the daytime absolute limit value for noise levels in a particular protected area (50 db(A)). Additionally since the proposed road runs adjacent to the lagoon closest to the urban areas, which means that the lagoon wildlife resides towards the opposite side of the lagoon, it can be predicted that traffic noise levels will not have any direct impact upon the lagoon wildlife.

Air pollution due to construction of the road could lead to a temporary movement of the fauna away from the area of construction and also a possible reduction of breeding success in the vicinity of the road. Conversely during the operational phase of the road, the projected traffic levels are relatively low and are likely to cause low emissions taking also in consideration the improvement in unitary vehicle emissions in the future.

Similarly dust caused by the construction of the road could cause habitat degradation and reduction of food resources for fauna species. During the construction phase the emission of dust is associated with various activities such as the removal of trees and topsoil, the excavation of earth material and the placement of the same material in embankments and the construction of structures. The emission of dust depends firstly on the weather conditions and on the level of activity and the type of operations being carried out. Also dust is raised by the wheels of the heavy construction vehicles as they pass along the construction site during dry weather conditions.

The stockpiles of loose materials are generally maintained in open conditions due to the necessity for frequent access to them by excavators and loaders etc. Therefore during dry weather conditions the EMP will require the road construction site and stockpiles to be subjected to wetting.

In the area of the proposed road, the areas that will suffer most due to the possible emission of dust during construction are the urban areas of Bishani, Novosela and Vlora. However since none of these settlements are within 300m of the road, it is foreseen that the construction activities will only have a moderate impact on the atmospheric quality of those areas.

Construction of the works, especially bridges, within rivers or other watercourses can cause deterioration of water quality and hence habitat degradation and damage or destruction of breeding sites for fish and other aquatic species. Similarly excavation for dyke construction could lead to deterioration of water quality and possible habitat degradation and damage or destruction of breeding sites for fish and benthic species. Excavation of construction materials and/or extraction of water from the river could lead to removal of fauna, habitat destruction and degradation, damage or destruction of breeding sites for fish and other aquatic species..

Erosion of slopes can have an impact on both terrestrial and aquatic habitats when the road passes near a watercourse. This can result in habitat degradation, species removal and damage or destruction of breeding sites for fish and benthic species.

During the operational phase the most damaging effect would be the accidental killing of animals or birds that cross the road.

1.6.7. AIR QUALITY

90 per cent of all passenger cars registered in Albania are equipped with diesel engines and the age of the car fleet is important since Albanians import large quantities of old cars from Western Europe. This explains why sulphur dioxide (SO₂) and particulate matter (PM) emissions per vehicle are relatively high. In addition, sulphur content in car fuel is likely to be above European standards (0.035% in 2000, sulphur-free fuel (rate < 0.005%) programmed in 2005), as well as that of lead. Due to the poor quality of the fuel, it is likely that few of the catalytic converters still work.

In Albania, fuel without lead is not yet available everywhere and vehicle maintenance is often not carried out according to the recommendations of the manufacturer. Therefore, emissions from vehicles contain considerable amounts of unburned fuel and special substances. Confrontation of these problems is a national issue that requires the application of standards and legislation and the GoA has increased taxation on leaded fuel to encourage more use of lead-free fuel, which will help reducing this impact.

The construction phase of a road scheme is a possible source of emissions of fine particulate matter which can have a temporary impact on the quality of the air in the area surrounding the construction sites.

During the construction phase the emission of dust is associated with various activities such as the removal of trees and topsoil, the excavation of earth material and the placement of the same material in embankments and the construction of structures. The emission of dust depends firstly on the weather conditions and on the level of activity and the type of operations being carried out. Also dust is raised by the wheels of the heavy construction vehicles as they pass along the construction site during dry weather conditions.

The stockpiles of loose materials are generally maintained in open conditions due to the necessity for frequent access to them by excavators and loaders etc. The emission of dust from such stockpiled materials can arise due to the following activities:

- formation of stockpiles using conveyor belt methods;
- impact of strong winds; and
- loading of the trucks for transport to the work sites.

The quantity of dust emitted depends on the volume of the stockpile, the degree of dampness of the material, the amount of the silt fraction in the material and the age of the stockpile. The maximum emission of dust tends to occur during the forming or shortly after the stockpile is placed. The reason for this is that the smallest particles near the surface of the stockpile are soon dispersed into atmosphere. Unless the stockpile is further disturbed, the potential for dispersion of dust is notably reduced. Dampness within the stockpile causes the aggregation and the cementation of the thinner particles onto the surface of the larger particles. Therefore during dry weather conditions the stockpiles should be subjected to wetting. The water penetrates into the stockpile thus delaying the drying process and reducing the emission of dust into the atmosphere.

1.6.8. NOISE

A modelling procedure has been used to forecast the daytime and night-time noise levels generated by the traffic using the proposed road. An assessment of airborne noise from the road, whilst in the operation phase, has been assessed up to 300 metres from the road boundary and is limited further by having regard to the threshold values in the evaluation criteria. This distance varied along the route depending on the pre-existing noise climate.

Changes in road traffic noise will generally be limited to 300m and to those routes where there is a significant change in traffic flow that can be directly attributed to the Scheme. For properties which are more than 300m from the edge of the proposed road, the varying effects of wind and temperature render forecasting of noise levels difficult in most circumstances. The nearest areas to the new road layout are Bishani and Novosela. These areas can be subjected to specific noise monitoring after the proposed road enters into use, in order to timely appraise the necessity for providing mitigation interventions.

It is necessary however to note that the levels of noise emission in the area of Bishani, reach a maximum value of 52.3 dB(A). This is therefore comparable to the daytime absolute limit value for noise levels in a predominantly residential area (55 db(A)).

In every case the values of noise emissions foreseen are less than 55 dB(A) in the daytime and 50 dB(A) during night-time. Hence during the operational phase of the proposed road, some areas will have a slight impact because of the noise generated by traffic using the new road.

Nevertheless according to the predicted noise levels in the vicinity of Panaja and Narta, which reflect the noise impact of the proposed road upon the Narta Lagoon area, reach a daytime maximum level of 47.7 dB(A). This is below the daytime absolute limit value for noise levels in a particular protected area (50 db(A)). Additionally since the proposed road runs adjacent to the lagoon closest to the urban areas, which means that the lagoon wildlife resides towards the opposite side of the lagoon, the predicted traffic noise levels will not have any direct impact upon the lagoon wildlife.

During the construction phase there will be large numbers of construction machineries being used and because of the nature of the work on a construction site it is normal that a high level of noise may be produced. However, the impact from the construction activity will be of a temporary nature and also will be relocated as the work progresses along the route.

1.6.9. LOCAL COMMUNITY AND SOCIO-ECONOMICS

The impact can be both negative and positive.

The most important negative effects are:

- The new road will be a barrier for the movement of cattle and sheep;
- The new road may be a barrier for children to go to school and for people to reach the shops etc.;
- During the construction phase the electric power and water supply may be impaired; and
- During the construction, the irrigation ditches and the drainage channels will be temporarily affected.

The main positive effects are:

- The new road will create a better connection with the region; and
- The new road will expand the economy of the area (new shops, bars, restaurants etc)

In particular the local communities will benefit from the following positive impacts:

Population - There is a significant population and activity along this road. The new road will provide a better connection between the smaller settlements, and also between them and the communities of Levan and Vlora and wider Albania, to the extent that the road could lead to improved economic conditions, not only for the residents alongside the existing road, but also for all the traffic in Vlora city.

Public Health - There is one hospital situated in the city of Vlora. There are also some public clinics along the existing road section. The new road will increase the speed and therefore provide a faster access for the people to these services. Provision of the new road will also reduce the traffic on the existing road, achieving the same purpose. In these conditions less air pollution will be produced by the same quantity of traffic. Since the new road avoids the settlements, this is another positive aspect for reducing air pollution within the inhabited areas.

Public Services - The improvement of traffic flow along the existing road is expected to have a slight impact on public services. These will include hospitals, clinics, schools, municipal buildings, other public service facilities and Vlora Port. Travel times to the public services may be shorter and employment with them may be more attractive, but the effect is expected to be small. On the other hand, the improvement of the existing road in the area where traffic is really a big problem could have a major direct impact. Access to public services will be far better.

The operation of the road can be expected to have a significant beneficial effect on the economy of the area through increased access to markets, enhanced agricultural production and secondary processing of materials, increased tourism and associated services, leading to an increase in employment. Improved access to health services and other facilities would have a positive effect on social welfare.

Temporary Employment During Construction - Whilst at the present time the Contractor who will undertake the construction of the proposed road is unknown, it is highly likely that there will be an opportunity for temporary employment of local labourers. In which case, the successful contractor will have to provide an action plan to ensure that their conditions comply with the Lender's requirements.

The following negative impacts upon the local communities will need to be addressed:

Public Utilities - The main public utilities will be temporarily affected by the project during the construction period. Relocation of these utilities may create temporary problems for the users. These problems may affect more users during the process of the connection of the new cables and pipes with the existing network of the users along the existing road. In these cases the contractor has to prepare a detailed action plan before each step of its activity on the site. The contractor must coordinate the activities with the responsible enterprises that have the ownership of these networks such as Altelecom, KESH (Electrical Corporation) and Water Enterprise in order to reduce the possibility of damages and the time of reconnecting the new links with the existing network.

Public Health - Although the new road will increase the speed and therefore provide a faster access for the people to public health services, there is however a correlation between speed and fatal accidents which needs to be managed along the proposed road through the traffic police operations and by the use of correct road signs.

Economical activities - The proposed scheme can be expected to lead to increased residential and commercial development adjacent to the new road. If development takes place on valuable agricultural land along the route, the scheme could have a moderate negative impact on these resources.

Possible Induced Impacts – Although an assessment of possible induced impacts is impossible, from past experience of new road construction in Albania it is highly likely that following the completion of the road, if not actually during its construction, there will be an increase in development of properties, both legal and illegal, adjacent to the new road. All new roads constructed to date have experienced this form of unplanned development. The types of development range from petrol stations, restaurants/bars, vehicle scrapyards, commercial shops/private kiosks and housing. The developments each tend to have their own access onto the new road, which increases the risk of road accidents and reduces the general level of road safety. Whilst planning regulations are available to control this type of development, often the regulations are not enforced. Therefore it will be essential for the Planning Authorities to strictly enforce the regulations for planning control in order to ensure that the land surrounding the proposed new road is not despoiled by unplanned developments, especially in the area of Narta lagoon.

Land Acquisition and Resettlement - The proposed road diverts from the existing road passing along a new corridor across areas of level land with a limited number of residents. The route generally crosses agricultural land and runs parallel to the railway line over a long length, occupying the same infrastructure corridor and so minimising the impact on residents and businesses.

Almost 115 ha of land is required for construction of the new road, of which almost 28 ha (24.2%) is state-owned land. Of the privately-owned land, almost 87 ha (75.6%) is agricultural land. The remaining 0.2 ha (0.2%) of private land is either commercial (0.15 ha = 0.15%) or residential (0.05 ha = 0.05%).

Since the road mainly traverses agricultural land, very few residential or commercial properties have to be expropriated. Twelve agricultural units will lose all their land and seven hundred and sixteen units will lose a part of their land (less than 80% of their total land-holding). One business loses the commercial property and the land and one business loses only the commercial land. Three families lose their residential property and all their residential land and a further family loses their residential property but only a portion of their residential land.

The land required for construction of the road project is principally in a rural area and therefore affected properties and assets are mainly connected with agriculture (i.e. fields, vineyards, fruit trees, olive groves etc.). Construction of the road in this area will affect 4 residences: 1 in the village Bishan - (still under construction, but now construction has been stopped) and 3 in Vlora (one of which is still under construction but again construction has been stopped). One single business, a fuel service station, is wholly affected by the road construction.

1.7. PROPOSED MITIGATION MEASURES

1.7.1. GENERAL MEASURES

As a general mitigation measure during construction, the road contractor will be required to prepare an environmental plan that will ensure that:

- *Construction works occurs mainly during dry season,*
- *Construction works near Narta Lagoon shall be undertaken outside the bird nesting season,*
- *Water channel, stream and river bed diversions are kept to a minimum,*
- *Works are strictly kept to the minimum near water channels, river and stream beds,*
- *Workers campsites are not near the River Vjosa or Narta Lagoon area,*
- *Materials will not be taken directly from the Vjosa river's bed and banks,*
- *Temporary sedimentation basins are created for siltation,*
- *Solid and liquid wastes are collected and/or recycled,*
- *Road platform is watered during dry periods to avoid dust emissions,*
- *Temporary storage areas and workers' campsites are rehabilitated to their original uses (agricultural land, natural land, etc.) after completion of the works.*
- *Valuable trees are protected.*

1.7.2. SPECIFIC MEASURES

1.7.2.1. Archaeology and Cultural Heritage

Due to the distance between the proposed road and the identified cultural heritage sites within the Narta Lagoon area, and only a slight possibility of archaeological artefacts being discovered during excavations, mitigation measures are neither required nor proposed. However "Chance Find" procedures shall include: (a) no moving or removal of any artefacts by workers, (b) immediately stop work and notify official from Institute of Archaeology, (c) only continue work after official government approval.

1.7.2.2. Landscape and Visual Amenities

Consideration was given to avoidance of impacts wherever possible during the selection and design of the proposed Scheme. In this respect the alignment has been selected to minimise impact on residential property, topographical features, trees and woodland wherever possible. However, as with any development some degree of impact is inevitable and wherever possible measures have been proposed to mitigate the negative nature of these impacts.

General measures will be applied over the entire Scheme depending on the nature of the particular road section, but will ensure that as a minimum a continuous grassland will be established along the proposed Scheme.

Proposals will ensure planting is distributed along the entire Scheme and the along the associated local drain channel in the section near Panaja.

The above-mentioned line of trees along the channel has a double function, to mitigate the visual impact of the road and also to provide a compensation for the environmental eco-system and create a network of ecological corridors that have the scope to reinstate the fauna movement interrupted by the road.

Landscape treatments will ensure that local species are used for the proposed plantings.

Special mitigation measures will be taken in order to protect the Lagoon. Such measures include construction and planting of barriers against noise and visual intrusion because of the project.

As such, the overall short to medium term impact of the proposed scheme on the landscape character is considered to be moderate.

In the longer term, as the road is integrated into the landscape through establishment and development of environmental mitigation, the impact is considered to be moderate to low.

For the purpose of mitigation, 'cut-off' light fittings will be used, where junctions are to be lit, and in combination with the extensive landscaping proposals, light spill effect will be minimal in the medium and long term.

1.7.2.3. Relief, Geology and Soils

Topsoil wherever removed shall be correctly handled and stored prior to re-use. It shall wherever practicable be used immediately after its stripping and if not shall be stored in stockpile heights not exceeding 2m and in addition shall not be stockpiled for more than two years. Topsoil shall not be unnecessarily trafficked either before stripping or when in a stockpile. Stockpiles shall not be surcharged or otherwise loaded and multiple handling shall be kept to a minimum. Furthermore topsoil shall not be excavated from stockpiles, whether on site or imported which have been exposed to a cumulative rainfall exceeding 100mm over the preceding 28 days. These details shall be stipulated in the Works Contract.

Any earth material which has to be excavated from cut sections or for drainage ditch construction and culvert installation is a natural resource and its use within the Scheme will be maximised by utilising construction techniques that retain and/or enhance the suitability of the material for use as engineered fill.

However, there will inevitably be a proportion of material, which due to its physical and structural properties is not suitable for use as engineering fill within the Scheme. This material is however suitable for other activities such as landscaping where such stringent structural requirements do not apply. The re-use of this material will be maximised within the Scheme, and should there be any excess material, this will be transported off site and placed in a location agreed with the local authority.

In order to prevent spoiling of materials, excavated materials intended for re-use will be handled and trafficked to a minimum and stockpiled in such a way so as to minimise the effects of weathering. The time between excavation and re-use during wet periods will be kept to a minimum. During prolonged wet periods, the contractor will suspend excavation and placement of these materials, to prevent degradation due to wetting. This will reduce the amount of material having to be removed from the site.

On completion of the road, visual inspections of all the structures along the alignment, including bridges, embankments and culverts would be undertaken to ensure that the road structures are not causing erosion, and to identify the requirements for and to carry out any remedial work. This would minimise the potential future impact of loss of soils and the associated landscape impacts caused by erosion.

1.7.2.4. Hydrology, Surface and Ground Water

During construction, the possible discharge of materials into the water is considered a moderate negative impact. However the EMP requires the Contractor to implement suitable procedures during construction to reduce the risk of pollution of water courses, the River Vjosa and the Narta Lagoon.

Silt and clay particles mobilised by rainfall and construction activities can percolate to a shallow water table, resulting in an impact on groundwater quality in the immediate vicinity of the construction works. However, natural groundwater quality should be restored within about 50m of flow away from the source and therefore the impact may be regarded as an imperceptible impact.

Local dewatering will be required during construction to install foundations for bridges and culverts, for some pipelines crossing beneath the highway, deep manholes, etc. However this impact is considered to be imperceptible.

Pollution control measures will be put in place during the construction process. These will include provision of bunds and siltation fences.

Stockpiles of the construction materials, such as asphalt, oil and chemicals shall not be located near to any surface watercourses, lagoons, lakes or water wells. The stockpiles will be located on sealed surfaces, covered with canvas sheets or a more permanent roof and surrounded by a bund to prevent runoff of spillages. Stockpiles should be protected to prevent vandalism and theft that can lead to spillages etc.

Side ditches will be constructed prior to road construction, to prevent the road run off flowing into streams, dykes or farmland. Temporary dykes will be provided to replace any existing dykes to be temporarily occupied.

During the phases of concrete casting, necessary for the construction of structures (piles, plinths, abutment walls), in order to avoid the dispersion of water and concrete in the soil and in the groundwater, some measures will be adopted, such as the positioning of sheet protection to contain the casting.

The site run off discharged from construction yard activities will be treated in accordance with their type. The water coming from washing of the machines and from the equipment will be treated by sedimentation in a settling tank for coarse particles and oil interceptors to allow the fine particles and the oils to then be eliminated. The water coming from washing of the aggregates and from the production of conglomerates will be treated by sedimentation in tanks and then used again or sent to another place.

Where the site run off is to be discharged to a river, the rate of discharge will be controlled so that it does not cause localised flooding in the watercourse.

In the event of a serious spillage of chemicals or fluids during construction, a programme of surface and groundwater measurements will be established by the Contractor. The groundwater sampling should take in situ measurements of pH, turbidity and electrical conductivity. The groundwater water samples taken should be of a sufficient amount to permit analyses for major cations and anions, BOD, COD, heavy metals, oil and grease or hexane solubles. The samples should be taken by a technically able person and analysed at an UCAS accredited laboratory.

Bridge construction in rivers containing fish stocks should be undertaken outside the fish spawning season, considered to be between May and June for the River Vjosa.

The design of the scheme ensures that catchment of road surface water occurs within the road margins: for stretches of road that are being improved, the catchment occurs at the edge of the lowest shoulder, according to the crossfall and direction of the curve and through the insertion of a drain at the edge of the central reserve.

Surface water drains across the transverse slope of the carriageway, due to the road crossfall, onto the carriageway margins where a system of interception, catchment and discharge pipes are located. For stretches of road in level areas, the catchment of surface water occurs in accordance with the element provided at the edge of the carriageway, established by a kerb in bituminous material of 0.15m height. Water is routed away through channels provided at intervals of 15 m and delivered to appropriate ditches provided at the base of the embankment. Surface water drainage will then be directly routed to final receivers (existing drainage systems).

The road intersects with numerous surface drainage networks, either natural or artificial. With regards to such intersections, pipes of different shapes and dimensions will be provided. The dimensions allocated to the manufactured products will be such that they guarantee the disposal of water from the drainage channels with an adequate level of safety. In all cases, their frequent maintenance and cleaning needs to be provided, in order to always ensure their correct hydraulic functionality. Existing ditch or waterway crossings encountered along the route of the road, will be provided with installations of either circular or rectangular pipes of reinforced concrete, according to the dimensions of the channel or ditch traversed.

For minor ditches, the dimension of the manufactured product is standardised by adopting circular concrete pipes of 1.0m diameter and adopting two or more units side-by-side where appropriate.

Rectangular pipes of minimum dimensions of 2.00x2.00 m are proposed for channels of larger dimensions and this permits maintenance inspections to be undertaken.

For the period when the road is in operation, long-term mitigation measures are designed into the Scheme primarily directed at pollution control and preventing increased risk of flooding on all watercourses. The existing dykes, channels, ditches and drains intercepted by the proposed road, except where prohibited by the vertical alignment of the road, have been kept open beneath the carriageway to maintain existing flow paths. Irrigations channels will be re-established using culverts or diverted as necessary as part of the project.

1.7.2.5. Habitat and Biodiversity

Loss of land and destruction of habitats due to construction of the road is unavoidable. However the selection of the route of the road during the design phase is important and as a result the road traverses mainly agricultural land or industrial land used for salt production. So loss of valuable habitats is not considered to be a problem since the land area required for the road is permanently being disturbed by the agricultural farmers. But in order to reduce the impact, the project allows for provision of landscaping of the road embankments, which will assist with restoring the habitat destroyed.

The Contractor's construction camp and compound should be located away from the River Vjosa and Narta Lagoon areas in order to reduce the likelihood of this impact on the flora and fauna. Additionally there will be a requirement within the Environmental Management Plan (EMP) for the areas required for the construction camps to be rehabilitated after the work is finished. Regarding the potential for pollution due to spillages, leakages etc. the EMP requires the construction of an appropriate drainage system for surplus water including the creation of sedimentation basins and the immediate collection and recycling of solid and liquid wastes and lubricants in the camping areas.

Road construction can have a significant impact on breeding birds. The contract will require that destruction of habitat shall be scheduled to ensure nesting birds are not disturbed. This will be most important where the alignment is routed through hedges alongside fields or through natural woodlands. For the nesting birds in the Narta lagoon area the proposed road doesn't create any problem or disturbance because the nesting area is on the western side of the lagoon furthest away from the proposed road alignment. After the work is finished the habitats should be rehabilitated. The road embankments should be landscaped after construction to assist in replacing the loss of habitat due to the road construction.

The Works contract documents and the EMP require that construction of structures, especially bridges, in rivers or other watercourses stocked with fish shall be undertaken outside the fish breeding season. Similarly excavation for dyke construction could lead to deterioration of water quality and possible habitat degradation and damage or destruction of breeding sites for fish and benthic species. Mitigation measures include construction of these types of works during the dry season and outside the fish breeding season. Excavation of materials and extraction of water from the river Narta shall not be permitted.

The proposed road will result in higher traffic speeds and an increased volume of traffic. This could have a moderate adverse impact on wild fauna, due to the increased risk of vehicles hitting animals or birds as they cross the road, especially from dusk to dawn. As mitigation, traffic signs will be used to alert drivers to areas where this is likely to occur, thereby reducing the risk of animals or birds being hit.

To reduce the risk of pollution of soils and water quality due to uncontrolled disposal of solid and liquid waste from the camp site or from leakage or spillage of vehicle fuels or lubricants, the contractor will be required to collect and recycle, where possible, the solid and liquid wastes from the camp site. Also sedimentation basins or protective bunds shall be constructed by the contractor to trap any fuel or lubricant spillage.

In order to minimise the impact from construction noise and vibration, the contract will limit the construction activities to reasonable hours, normally not between 11pm and 7am. The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract. Compressors will be attenuated

models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. Additionally construction of planted noise mounds adjacent to the Narta Lagoon will assist in minimising the potential noise impact on the wildlife resident within the lagoon area.

The implementation of dust suppression systems such as watering of site roads, using wheel washes at every storage area and limiting the speed of mobile plant on site roads will be carried out by the contractor to limit dust emissions. During dry weather conditions the EMP will require the road construction site and stockpiles to be subjected to wetting. The water penetrates into the earthworks area and stockpiles thus delaying the drying process and reducing the emission of dust into the atmosphere. Additionally the EMP shall require trucks transporting loose materials by to be wetted or covered during transit.

Nevertheless the EMP will require that monitoring of the quality of the air in areas around the construction sites is undertaken during the construction process in order to reveal as early as possible any problems arising from emissions due to the construction process. But it must be emphasised that good management of the construction site and the planning of the work must be organized in such way to keep the impacts from site emissions to the shortest period possible.

Erosion of slopes of can be prevented by planting of trees and shrubs and grassing of exposed surface slopes. Also construction in these areas during the dry season should be undertaken whenever possible.

The law should be strengthened in order to protect the areas from hunting and tree cutting. Urban development should be controlled along the proposed road.

During the operational phase the most damaging effect would be the accidental killing of animals or birds that cross the road. Mitigation measures will be included in the works. These will include construction of concrete culverts under the road for use as animal underpasses and close-linked fencing to ensure that animals are guided to these culvert crossings and thus prevented from crossing the road at other locations. Additionally traffic signs will be erected in the vicinity of the lagoon to warn drivers of animals.

1.7.2.6. Air Quality

The long-term projected traffic levels are relatively low and are likely to cause low emissions taking into consideration also the improvement in unitary vehicle emissions in the future as the old vehicle fleet is replaced. A modelling procedure has been used to forecast the emission levels of the gases Carbon Monoxide (CO), Nitrogen Dioxide (NO₂) and Particulate Matter (PM₁₀) generated by the traffic using the proposed road in 2013.

On balance the proposed road should not cause an increase in vehicle-generated emissions, as emissions are dependent of the type of vehicle, the maintenance of the engine, and the speed of the vehicle. On the one hand, a uniform road surface will lead to more constant speeds, which will cause a reduction in the emissions, as emission-causing accelerations can be avoided. Also the amount of dust that is being spread by the passage of vehicles will be reduced, as potholes will disappear. On the other hand, an increase in average vehicle speed is expected on the new road, which may slightly increase the emissions.

With regard to traffic levels and the open character of areas crossed by the proposal, the road itself should not lead to any significant increase in pollutant levels. In consequence the WHO air quality guidelines are likely to be respected.

No mitigation measures are proposed due to the low impact of the project. However, in order to verify the air quality in the study area, sampling should be taken before construction of road commences and after some years using passive sampling as part of a plan of Environmental Control.

During the construction phase the implementation of dust suppression systems such as watering of site roads, using wheel washes at every storage area and limiting the speed of mobile plant on site roads will be carried out by the contractor to limit dust emissions. Additionally the construction machinery will need to meet EU air emission standards.

1.7.2.7. Noise

The contract documents will clearly specify that the Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures and comply with the recommendations of the European Communities (Construction Plant and Equipment) (Permissible Noise Levels Regulations 1988).

These measures will ensure that the following key measures are applied:

- No plant used on site will be permitted to cause a public nuisance due to noise.
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.
- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.
- Any plant, such as generators or pumps, that is required to operate before and after legal working hours will be surrounded by an acoustic enclosure or portable screen.

The proposed plan for the road may increase the noise level slightly along the Narta Lagoon area which is considered as a very quiet area, especially at night, and a noise mitigation mound will be provided to screen the road from the Lagoon.

1.7.2.8. Local Community and Socio-Economics

During construction specific measures will be taken by the contractor, in accordance with the EMP, in order to maintain water, electricity and gas services to the neighbouring residents and farm inhabitants and industries. Irrigation and drainage channels will also be kept functioning as well.

In paragraph 1.6.9 one of the negative impacts identified is the possibility of the proposed road creating a barrier-effect to the communities affected by the new road. This can be in the form of restricting animal movement across separated areas of farmland. Or it can be a barrier to the population having to cross the road to reach schools, workplaces or other neighbouring communities.

Mitigation measures can be provided by careful selection of the route of the road in order to minimise the actual severance of the communities. But where severance does occur then this can be reduced to a minimum by the introduction of under/overpasses or additional junctions to provide access across or onto the new road. Alternative Route A, which was selected as the preferred alignment for the proposed road, reduces the barrier effect on the area by careful reconnection of the intersected local roads, through provision of secondary roads, underpasses, roundabouts etc. which drastically reduces the phenomenon of uncontrolled crossing (currently a cause of numerous accidents).

Public Utilities – During construction, the main public utilities may be affected by the project. Temporarily during the construction period, relocation of these utilities may create problems for the users. These problems may affect more users during the process of the connection of the new cables and pipes with the existing network of the users along the existing road. In these cases the contractor has to prepare a detailed action plan before each step of its activity on the site. This plan must foresee the accommodation and protection of all public utilities established in the site of activities, such as telephone and electrical cables, fibre-optic cables, water supply pipelines, road lighting cables or other facilities that might result from an inspection of the site. The contractor must co-ordinate the activities with the responsible enterprises that have the ownership of these networks such as Albtelecom, KESH (Electrical Corporation) and Water Enterprise in order to reduce the possibility of damages and the time of reconnecting the new links with the existing network. This plan must be reviewed initially by the Supervision Engineer and the Contractor must start the implementation after the final approval of the Employer.

Possible Induced Impacts through Economical activities - The proposed scheme can be expected to lead to increased residential and commercial development adjacent to the new road. If development takes place on valuable agricultural land along the route, the scheme could have a moderate impact on these resources. Whilst planning regulations are available to control this type of development, often the regulations are not enforced. Therefore it will be essential for the Planning Authorities to strictly enforce the regulations for planning control in order to ensure that the land surrounding the proposed new road is not despoiled by unplanned developments, especially in the area of Narta lagoon. Enhanced enforcement is also required to protect the land and to prevent the scheme leading to an increase in unlicensed tree-felling and quarrying and also illegal dumping of waste materials alongside the route.

Health and Safety - Road Safety Audits shall be undertaken by a road safety expert. The road safety audit programme will include audits at the following stages: on completion of construction and prior to commissioning of the road; and again approximately two years after the road has been opened.

Acquisition of land and other assets, and resettlement of people will be minimised as much as possible. All Project Affected Persons (PAPs) residing, working, doing business, cultivating, or having rights over resources within the project area are entitled to compensation for their lost assets at replacement cost.

Replacement cost is the rate of compensation for lost assets, which is calculated at full replacement value. It is the market value of the assets plus transaction costs. With regard to land and structures, replacement cost is defined as follows:

Agricultural land: the market value of land of equal productive use or potential located in the vicinity of the affected land, plus the cost of preparation to levels similar to or better than those of the affected land, plus the cost of any registration and transfer taxes.

Household and Public Structures: the cost of purchasing or building a new structure, with an area and quality equivalent or similar to or better than those of the affected structure, or of repairing a partially affected structure, including labour and contractor's fees and any registration and transfer taxes.

Economic displacement: loss of income streams or means of livelihood resulting from land acquisition or obstructed access to resources (land, water or forest) resulting from the construction or operation of a project or its associated facilities.

Lack of legal rights will not bar the PAP from entitlement to such compensation for his/her lost assets (improvements including structures, houses, crops, trees, etc.).

PAPs suffering partial loss of agricultural or commercial land or structures will be entitled for full compensation for the entire affected assets at replacement cost paid in cash. For those PAPs who lose all agricultural land, commercial land, all businesses, residences etc., and are considered fully displaced by the RAP will not only be entitled to cash compensation for the entire affected asset at replacement cost, but also assistance for moving/ relocation (in lieu of cash for moving allowance). In order to assist those PAPs who have to relocate their house or business, the GRD will advise them that the GRD's Regional Office will provide the PAP with vehicles for transporting their goods and belongings to the new location. The GRD will liaise closely with those who have to relocate in order to be able to provide the necessary transport facilities at the required time for relocation. This support offered is expected to restore the livelihood and standards of living of those PAPs displaced by the project.

Two vulnerable groups are observed within the area of the proposed new road. These are firstly the Rom community, who live in Levan but own agricultural land in the surrounding area and secondly new inhabitants who have constructed their houses on an area of land which was set aside for development during 1990 in order to be closer to the labour markets offered by the city. Members of both these vulnerable groups, who are directly affected by the road, will be treated the same as every other PAP and will be entitled to receive the normal compensation.

During the public consulting process, the GRD's ED concluded that there is no 'community' dislocation, because only a small number of owners (5) will lose their house or commercial premise. According to the investigation, all these PAPs prefer to stay nearby their community and intend buying or constructing a new house, in the locality, with the money received from the compensation. Most prefer to build a house on nearby land not affected by the road construction with the money received from the compensation. There is only one businessperson that fully loses his property and he prefers to continue the same business in the area using the compensation money.

Valuation for the Compensation of Lost Assets

The GRD's Expropriation Department (ED) handles the land acquisition for the Levan to Vlora road scheme for the Directorate. ED carries out a technical evaluation of the expropriations required for the project, and then submits it to the MPWTT Expropriation Commission led by the Vice-Minister. Other Ministries such as Economics, Finance, MAFCP, etc. would be represented as needed on the commission.

ED on behalf of GRD undertakes the evaluation of land to be expropriated. The land evaluation is made according to its category: agricultural land, crops, vineyards, fruit trees, olive groves, soil forest etc. The valuation is established through consultation with the regional offices of the agriculture and urban affairs where data concerning the buying and selling during the previous three months are available. If this is not possible, the value of agricultural land is requested from MAFCP who, with assistance from an authorized group within the local MAFCP office, makes the evaluation. For the case of land for crops, in the absence of data for the project area from the local real estate registration office, values are determined from data for a similar area.

To evaluate buildings or other assets, according to the COM, the evaluation will be made by the cost method discounting the amortization in the absence of data from the local real estate registration office. In the case of residential buildings, data from the National Building organisation will be used. For the evaluation of agricultural crops, fruit trees, vineyards, olive-groves etc. data will be collected from the MAFCP regional directorates.

Under application of Law No. 8561 the GRD's ED establishes if the required parcels of land are urban or suburban or if they are agricultural. All the relevant information concerning the type and ownership of land to be expropriated can be found in the local cadastre offices, which are now located in each district of Albania. These offices and the Districts' Urban Departments play a key role in the expropriation procedure; they are advisory and assist ED in preparation of the necessary documentation for the Commission, MPWTT.

The price per square metre of land to be expropriated is valued based on the market price in the relevant area. The value of agricultural land in the project area ranges from 400 to 1,000 lek/sq.m. Buildings are valued based on the price of construction material with which they have been built. The market price remains the most reliable way to evaluate buildings also having a commercial use, i.e. kiosks, shops, workshops or commercial enterprises.

The market value which the GRD proposes to provide to PAPs reflects adequate compensation for the asset to be expropriated. It must be noted that active markets for land, housing, and labour exist and not only do people use such markets, there is also sufficient supply of both land and housing. The GRD considers that the market values proposed are fair and reasonable and will be adequate for the affected PAPs to purchase alternative land of the same size and quality, within the Vlora area, and to rebuild their properties at full replacement cost.

1.7.3. OTHER ACTIVITIES

1.7.3.1. Public consultation

Consultation is an integral part of the EIA process. In line with the development of the EIA a consultation strategy has been prepared. The consultation on environmental matters is based on the 'Aarhus' Convention, which adopts a rights-based approach and focuses on interactions between the public and public authorities in a democratic context. The Convention requires parties to guarantee rights of access to information, public participation in decision-making and access to justice in environmental matters. The Convention sets out minimum requirements for public participation in various categories of environmental decision-making.

Public participation requirements include:

- Timely and effective notification of the public concerned;
- Reasonable timeframes for participation, including provision for participation at an early stage;
- A right for the public concerned to inspect information which is relevant to the decision-making free of charge;
- An obligation on the decision-making body to take due account of the outcome of the public participation; and
- Prompt public notification of the decision, with the text of the decision and the reasons and considerations on which it is based being made publicly accessible.

The 'public concerned' is defined as 'the public affected or likely to be affected by, or having an interest in, the environmental decision-making' and explicitly includes NGOs promoting environmental protection and meeting any requirements under national law.

Specific objectives of the public information campaign and public consultation are as follows:

- To share fully the information about the proposed project, its components and its activities, with affected people;
- To obtain information about the needs and priorities of the affected people, as well as information about their reactions to proposed policies and activities;
- To inform about the various options for relocation and compensation measures available to people;
- To obtain the co-operation and participation of the affected people and communities in activities required to be undertaken for resettlement planning and implementation; and
- To ensure transparency in all activities related to land acquisition, resettlement and rehabilitation.

Information dissemination to the public, together with consultation with and participation of PAPs and involved agencies, reduces the potential for conflicts, minimises the risk of project delays and enables the project to include resettlement and rehabilitation as a comprehensive development programme to suit the needs and priorities of the PAPs, thereby maximising the economic and social benefits of investments.

The initial consultation has recently been undertaken to make the public in the area between Levan and Vlora aware of the proposed road construction project and to collect feedback from both the public and the Community leaders. A second consultation will take place in the region when this EIA Report is prepared and considered "fit for purpose" for public consultation by EBRD and can be published for receipt of comments from affected or interested parties.

Consultation with communities directly impacted by the Scheme was carried out during the preparation of the EIA. Consultation was carried out with the Heads of the following Communes: Levan, Novosela and Qender to inform them regarding the proposed road project and to collect information from them especially in connection with the resettlement issues.

The public were invited to take part in a preliminary consultation exercise to assist with the preparation of this EIA. Two initial public consultations were held on 16th and 17th September 2006, in Novosela and Levan respectively. The aim of the consultation exercise was to inform the public of the road scheme under preparation and to collect feedback from members of the public and from the representatives of the local Communes. The two consultations were advertised in the press and on display in public venues in the locality.

During these initial consultations, staff from the GRD's Environmental Department and Sintagma was available to answer questions and listen to suggestions and objections. The main concern of the residents and the communities has been directed towards the problems regarding expropriation. In particular the issue concerns formal legalisation of the affected peoples' land and property in order that their assets can be legally acquired by the MPWTT for construction of the road. The residents were concerned that they would need to obtain the necessary documents for legalising the ownership of the land which they occupy.

The GRD's Expropriation Department (ED) carried out the household/property and land survey to determine all affected assets within the area required to construct the proposed road project. During the household survey, a representative from the GRD carried out a consultation process and gathered

information on households, their incomes, preferences for moving and amount of property and land lost as a result of the road project. In general terms, if more than 80% of an owner's piece of land was required the GRD offered expropriation of all of the PAP's land. So when the GRD encountered a landowner whose remaining piece of land was less than 20%, they opened up a discussion with the landowner to ascertain their requirements for total expropriation. If the landowner requested complete expropriation, then the GRD arranged to expropriate the whole parcel of land. During this public consulting process, the GRD ED's representative investigated where displaced PAPs would desire to be relocated.

Additionally during the consultation process the PAPs were informed that their lack of legal rights will not bar PAPs from entitlement to compensation for their lost assets (improvements including structures, houses, crops, trees and other fixed assets). Detailed site visits have clarified that there are no illegal encroachers on land, who occupy, reside and cultivate land that does not belong to them. However, most owners of land or buildings to be expropriated do not have the necessary land registry documents or building permits. This is a common occurrence in Albania and the GRD confirmed that they will work with the concerned municipalities to ensure that the occupiers of land and buildings who do not have the legal documentation are in fact helped to obtain these permits so that they are rendered legal and the land or properties may then be duly expropriated by the GRD and the buildings demolished for project purposes.

Public Information Dissemination

The GRD's ED provided information on the Project to the Local Authorities, the Communes, the Village heads, and the inhabitants of the settlements through which the proposed road passes through various briefings and meetings. Additionally, the ED survey team informed the communities about the project objectives, its likely impacts and benefits to the PAPs and beneficiary population, during the census and baseline survey. The socio-economic survey of the affected households revealed that most of the respondents were aware of the project prior to the survey taking place.

Project authorities, through GRD will ensure that Local Authorities, as well as representatives of PAPs, will be included in the implementation process. The project authorities will continue the dialogue with local officials and representatives of the PAPs during the Project implementation process. PAP participation would also be ensured during final assessment of compensation, resettlement and monitoring.

1.7.3.2. Environmental Monitoring

The Environment Monitoring Plan defines the ways by which monitoring of environmental impacts will be carried out and implementation of the mitigation measures will be completed during the construction phase. Monitoring will be concentrated on the impacts identified in the EIA in order to insure the effectiveness of the planned mitigation measures.

Table - ENVIRONMENTAL MANAGEMENT PLAN

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Issue
			Install	Operate	Install	Phase	
Construction	<u>Material Supply</u>	<u>Material Supply</u>					
	(a) Asphalt Plant -dust -worker health/safety	(a) Requirement for official approval or a valid operating license from National Environmental Agency of Albania (NEAA) specified in bid document	(a) NA	(a) NA	(a) Asphalt Plant Owner	(a) Asphalt Plant Owner	
	(b) Stone Quarry -dust -worker health/safety	(b) See (a)	(b) NA	(b) NA	(b) Stone Quarry Owner	(b) Stone Quarry Owner	
	(c) Sand/Gravel -disturbance to river bed / water quality/ ecosystem	(c) See (a)	(c) NA	(c) NA	(c) Sand/Gravel Contractor	(c) Sand/Gravel Contractor	
	(d) Borrow pits	(d) See (a) plus borrow pit areas to be restored at end of Contract	(d) NA	(d) NA	(d) Construction Contractor	(d) Construction Contractor	(d) to be specified in bid documents
	<u>Material Transport</u>	<u>Material Transport</u>					
	(a) Asphalt -dust/fumes	(a) Asphalt -cover truck load	(a) NA	(a) NA	(a) Truck operator	(a) Truck operator	
	(b) Stone -dust	(b) Stone -wet or cover truck load	(b) NA	(b) NA	(b) Truck operator	(b) Truck operator	(a), (b), (c), (d) to be specified in bid documents
	(c) Sand/Gravel -dust	(c) Sand/Gravel -wet or cover truck load	(c) NA	(c) NA	(c) Truck operator	(c) Truck operator	
	(d) Traffic Management -noise and vehicular exhaust, road congestion	(d) Haul material at off-peak traffic hours Use routes to minimize major traffic sites	(d) NA	(d) Minimal	(d) Truck operator	(d) Truck operator	

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Issue
			Install	Operate	Install	Phase	
Construction	<u>Erosion Protection</u> (a) Risk of erosion (along embankments adjacent to the proposed road and the opposite riverbank).	<u>Erosion Protection</u> (a) Groynes or Gabions should be used.	(a) NA	(a) NA	(a) Construction Contractor	(a) Construction Contractor	(a) to be specified in bid documents
	<u>Soil Protection</u> (a) Loss of topsoil and erosion of bare ground	<u>Soil Protection</u> (a) Careful storage of topsoil for re-use and rapid re-establishment of base areas of ground	(a) NA	(a) NA	(a) Construction Contractor	(a) Construction Contractor	(a) to be specified in bid documents
	(b) Loss of agricultural soil through ponding behind the flood prevention embankment	(b) Embankment to incorporate flood relief outlets (with flap valves if necessary)	(b) NA	(b) NA	(b) Construction Contractor	(b) Construction Contractor	(b) to be specified in bid documents
	<u>Cultural Heritage</u> (a) Archaeological finds	(a) Archaeological supervision during construction. In the event of a find stop work, notify archaeological authority and follow their directions. No artefacts are to be moved or removed until government officially approves it.	(a) NA	(a) NA	(a) Construction Contractor	(a) Construction Contractor	(a) to be specified in bid documents

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Comments
			Install	Operate	Install	Operate	
Construction	<u>Construction Site</u>	<u>Construction Site</u>					
	(a) Noise	(a) Limit activities to reasonable hrs (not between 11 PM and 7 AM or as agreed by Supervision Consultant)	(a) NA	(a) NA	(a) Construction Contractor	(a) Construction Contractor	
	(b) Dust	(b) Water construction site and materials storage sites as appropriate (during dry, windy conditions)	(b) YES	(b) YES	(b) Construction Contractor	(b) Construction Contractor	
	(c) Traffic Disruption (during construction activity)	(c) Appropriate measures to redirect traffic that are easily seen or easy to follow including preparation of a traffic management plan	(c) NA	(c) NA	(c) Construction Contractor	(c) Construction Contractor	(a), (b), (c), (d) (e) and (f) to be specified in bid documents
	(d) Vehicular/pedestrian safety (off hours when there is no construction activity)	(d) Appropriate lighting and well defined safety signs included in traffic management plan	(d) YES	(d) YES	(d) Construction Contractor	(d) Construction Contractor	
	(e) Water Pollution from Improper Materials Storage/Management	(e) Cover material storage areas Construct channels to direct runoff to sewage system or appropriate treatment facility	(e) YES	(e) YES	(e) Construction Contractor	(e) Construction Contractor	
	(f) Sediment runoff	(f) provide sediment fence, straw bales or other sediment traps	(f) YES	(f) YES	(f) Construction Contractor	(f) Construction Contractor	

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Issue
			Install	Operate	Install	Phase	
Construction	<u>Construction Site</u>	<u>Construction Site</u>					
	(g) Protection of water resources	(g) Take measures (diversion ditches, etc.) to prevent the direct entry of water from construction sites into streams, canals, lakes, wells and aquifers; provide detention basins, where needed	(g) YES	(g) YES	(g) Construction Contractor	(g) Construction Contractor	(g), (h), (i) and (j) to be specified in bid documents
	(h) Archaeological finds	(h) Notify archaeological authority and follow their directions	(h) NA	(h) NA	(h) Construction Contractor	(h) Construction Contractor	
	(i) Construction camps Garbage removal Sewage management	(i) Location of construction camps to be approved by local authority and camps to be fenced and screened. Sewage disposal to be to sewer system if available, otherwise to be to constructed cesspools. Garbage disposal to be delivered to authorised tips only.	(i) YES	(i) YES	(i) Construction Contractor	(i) Construction Contractor	
	(j) Bridge Construction over rivers and watercourses - Water pollution risk from bridge construction during fish spawning season	(j) Construct bridges within rivers out of fish breeding season	(j) NA	(j) NA	(j) Construction Contractor	(j) Construction Contractor	
	<u>Waste Disposal</u>						
	(a) Construction debris (concrete, asphalt, fuels, paints, contaminated soil)	(a) Dispose of in approved locality and cover with inert material.	(a) YES	(a) NA	(a) Construction Contractor	(a) NA	(a) and (b) to be specified in bid documents
	(b) Solid waste	(b) Dispose of in accordance with the directions of the Prefect of Vlora and the Institute of Hygiene and Sanitation.	(b) YES	(b) YES	(b) Construction Contractor	(b) Construction Contractor	

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Issue
			Install	Operate	Install	Phase	
Construction	<u>Proposed Specific Mitigation Measures for:</u>	<u>Landscape and Visual Amenities</u>					
		(a) Tree planting using local species and grass seeding of embankment slopes where possible and along the associated drain channel in the section near Panaja.	(a) YES	(a) NA	(a) Construction Contractor	(a) Construction Contractor + GRD	(a) to (f) to be specified in Contract Documents (By Variation Order if necessary)
		(b) Construction and planting of noise barrier mound adjacent to Narta Lagoon.	(b) YES	(b) NA	(b) Construction Contractor	(b) Construction Contractor + GRD	
		(c) Where road lighting is proposed, 'cut-off' light fittings will be used to reduce light spill effect.	(c) YES	(c) NA	(c) Construction Contractor	(c) Construction Contractor + GRD	
		<u>Relief, Geology and Soils</u>					
		(d) Topsoil wherever removed shall be correctly handled and stored prior to re-use.	(d) NO	(d) NA	(d) Construction Contractor	(d) Construction Contractor + GRD	
(e) Use of any earth material which has to be excavated from cut sections or for drainage ditch construction and culvert installation will be maximised by utilising construction techniques that retain or enhance the suitability of the material for re-use.	(e) NO	(e) NA	(e) Construction Contractor	(e) Construction Contractor + GRD			
		(f) Re-use of excavated earth material unsuitable for engineering fill will be used in landscaping areas.	(f) NO	(f) YES	(f) Construction Contractor	(f) Construction Contractor + GRD	

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Issue
			Install	Operate	Install	Phase	
Construction	<u>Proposed Specific Mitigation Measures for:</u>	<u>Relief, Geology and Soils (cont.)</u> (g) Excavated materials intended for re-use will be handled and trafficked to a minimum and stockpiled in such a way so as to minimise the effects of weathering. The time between excavation and re-use during wet periods will be kept to a minimum. During prolonged wet periods, the contractor will suspend excavation and placement of these materials.	(g) NO	(g) NA	(g) Construction Contractor	(g) Construction Contractor + GRD	(g) to (i) to be specified in Contract Documents
		(h) On completion of the road, visual inspections of all the structures along the alignment, including bridges, embankments and culverts will be undertaken to ensure that the road structures are not causing erosion problems.	(h) NO	(h) NA	(h) GRD	(h) GRD	
		<u>Hydrology, Surface and Ground Water</u> (i) During construction the possible discharge of materials into watercourses is considered a moderate risk. However the contractor will be required to implement suitable procedures during construction to reduce the risk of pollution of watercourses. These are identified under "Construction Site".	(i) NO	(i) NA	(i) Construction Contractor	(i) Construction Contractor + GRD	

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Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Issue
			Install	Operate	Install	Phase	
Construction	<u>Proposed Specific Mitigation Measures for:</u>	<u>Hydrology, Surface and Ground Water (cont.)</u>					
		(j) Pollution control measures will be put in place by the contractor during the construction process. These will include provision of bunds and siltation fences.	(j) NO	(j) NA	(j) Construction Contractor	(j) Construction Contractor + GRD	(j) to (l) to be specified in Contract Documents
		(k) Stockpiles of construction materials, such as asphalt, oil and chemicals shall not be located near to any surface watercourses, lagoons, lakes or water wells. Stockpiles shall be located on sealed surfaces, covered with canvas sheets or a more permanent roof and surrounded by a bund to prevent runoff of spillages.	(k) NO	(k) NA	(k) Construction Contractor	(k) Construction Contractor + GRD	
(l) Site run off discharged from construction yard activities will be treated in accordance with their type. The water coming from washing of the machines and from the equipment will be treated by sedimentation in a settling tank for coarse particles and oil interceptors to allow the fine particles and the oils to then be eliminated. The water coming from washing of the aggregates and from the production of conglomerates will be treated by sedimentation in tanks and then used again or sent to another place.	(l) NO	(l) NA	(l) Construction Contractor	(l) Construction Contractor + GRD			

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Issue
			Install	Operate	Install	Phase	
Construction	<u>Proposed Specific Mitigation Measures for:</u>	<u>Hydrology, Surface and Ground Water (cont.)</u> (m) In the event of a serious spillage of chemicals or fluids during construction, a programme of surface and groundwater measurements will be established by the Contractor. The groundwater sampling should take in situ measurements of pH, turbidity and electrical conductivity. The groundwater water samples taken should be of a sufficient amount to permit analyses for major cations and anions, BOD, COD, heavy metals, oil and grease or hexane solubles. The samples should be taken by a technically able person and analysed at an UCAS accredited laboratory.	(m) YES	(m) NA	(m) Construction Contractor	(m) Construction Contractor + GRD	(m) to (p) to be specified in Contract Documents
		<u>Habitat and Biodiversity</u> (n) The Contractor's construction camp and compound should be located away from the River Vjosa and Narta Lagoon areas in order to reduce the likelihood of this impact on the flora and fauna.	(n) NO	(n) NA	(n) Construction Contractor	(n) Construction Contractor + GRD	
		(o) Construction camp areas are to be rehabilitated after the work is finished.	(o) NO	(o) NA	(o) Construction Contractor	(o) Construction Contractor + GRD	
		(p) Removal of hedges or woodlands shall be scheduled to ensure nesting birds are not disturbed.	(p) NO	(p) NA	(p) Construction Contractor	(p) Construction Contractor + GRD	

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Issue
			Install	Operate	Install	Phase	
Construction	<u>Proposed Specific Mitigation Measures for:</u>	<u>Hydrology, Surface and Ground Water (cont.)</u>					
		(q) After the work is finished the habitats should be rehabilitated and the road embankments should be landscaped to assist in replacing the loss of habitat due to the road construction.	(q) NO	(q) NA	(q) Construction Contractor	(q) Construction Contractor + GRD	(q) to (t) to be specified in Contract Documents
		(r) Construction of structures, especially bridges, in rivers or other watercourses stocked with fish shall be undertaken outside the fish breeding season.	(r) NO	(r) NA	(r) Construction Contractor	(r) Construction Contractor + GRD	
		(s) Excavation of materials and extraction of water from the river Narta shall not be permitted.	(s) NO	(s) NA	(s) Construction Contractor	(s) Construction Contractor + GRD	
<u>Air Quality</u>							
		(t) No mitigation measures are proposed due to the low impact of the project. However, in order to verify the air quality in the study area, sampling should be taken before construction of road commences and after some years using passive sampling as part of a plan of Environmental Control.	(t) YES	(t) NA	(t) GRD	(t) GRD	

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Issue
			Install	Operate	Install	Phase	
Construction	<u>Proposed Specific Mitigation Measures for:</u>	<p><u>Air Quality (cont.)</u></p> <p>(u) During the construction phase the implementation of dust suppression systems such as watering of site roads, using wheel washes at every storage area and limiting the speed of mobile plant on site roads will be carried out by the contractor to limit dust emissions. Additionally the construction machinery will need to meet EU air emission standards.</p>	(u) NO	(u) NA	(u) Construction Contractor	(u) Construction Contractor + GRD	(u) and (v) to be specified in Contract Documents
		<p><u>Noise</u></p> <p>(v) The Contractor shall be obliged to take specific noise abatement measures and comply with the recommendations of the European Communities (Construction Plant and Equipment) (Permissible Noise Levels Regulations 1988). These measures will ensure that the following key measures are applied:</p> <ul style="list-style-type: none"> - No plant used on site will be permitted to cause a public nuisance due to noise. - The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. 	(v) NO	(v) NA	(v) Construction Contractor	(v) Construction Contractor + GRD	

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Issue
			Install	Operate	Install	Phase	
Construction	<u>Proposed Specific Mitigation Measures for:</u>	<p><u>Noise (cont.)</u></p> <ul style="list-style-type: none"> - All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract. - Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. - Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use. - Any plant, such as generators or pumps, that is required to operate before and after legal working hours will be surrounded by an acoustic enclosure or portable screen. 	(v) NO	(v) NA	(v) Construction Contractor	(v) Construction Contractor + GRD	(v) and (w) to be specified in Contract Documents (By Variation Order if necessary)
		<p>(w) The proposed plan for the road may increase the noise level slightly along the Narta Lagoon area which is considered as a very quiet area, especially at night, and a noise mitigation mound will be provided to screen the road from the Lagoon.</p>	(w) YES	(w) NA	(w) Construction Contractor	(w) Construction Contractor + GRD	

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Issue
			Install	Operate	Install	Phase	
Construction	<u>Proposed Specific Mitigation Measures for:</u>	<p><u>Local Community and Socio-Economics</u></p> <p>(x) During construction, specific measures will be taken by the contractor in order to maintain water, electricity and gas services to the neighbouring residents and farm inhabitants and industries.</p> <p>Temporarily during the construction period, relocation of these utilities may create problems for the users. These problems may affect more users during the process of the connection of the new cables and pipes with the existing network of the users along the existing road. In these cases the contractor has to prepare a detailed action plan before each step of its activity on the site. This plan must foresee the accommodation and protection of all public utilities established in the site of activities or other facilities that might result from an inspection of the site.</p>	(x) NO	(x) NA	(x) Construction Contractor	(x) Construction Contractor + GRD	(x) to be specified in Contract Documents

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Issue
			Install	Operate	Install	Phase	
Construction	<u>Proposed Specific Mitigation Measures for:</u>	<u>Local Community and Socio-Economics</u> (x) (continued) - The contractor must co-ordinate the activities with the responsible enterprises that have the ownership of these networks in order to reduce the possibility of damages and the time of reconnecting the new links with the existing network. This plan must be reviewed initially by the Supervision Engineer and the Contractor must start the implementation after the final approval of the Employer.	(x) NO	(x) NA	(x) Construction Contractor	(x) Construction Contractor + GRD	(x) to (z) to be specified in Contract Documents
		(y) Irrigation and drainage channels will also be kept functioning as well.	(y) NO	(y) NA	(y) Construction Contractor	(y) Construction Contractor + GRD	
		(z) The proposed scheme can be expected to lead to increased residential and commercial development adjacent to the new road. It will be essential for the Planning Authorities to strictly enforce the regulations for planning control in order to ensure that the land surrounding the proposed new road is not despoiled by unplanned developments, especially in the area of Narta lagoon.	(z) NO	(z) NA	(z) GRD and Planning Authority	(z) GRD and Planning Authority	

Phase	Issue	Mitigating Measure	Cost		Institutional Responsibility		Issue
			Install	Operate	Install	Phase	
Operation	<u>Maintenance of Constructed Road</u> (a) Noise	<u>Maintenance of Constructed Road</u> (a) Limit activities to reasonable hours (not between 7 PM and 7 AM except for winter maintenance) or as agreed by Local Authority	(a) NA	(a) Minimal	(a) NA	(a) GRD	(a) to be specified in bid documents
	<u>Road Safety</u> (a) Erosion, or hazardous conditions	<u>Road Safety</u> (a) Install appropriate warning signs (landslide, wet or slippery conditions, dangerous curve, animal or pedestrian crossing, school, slow moving vehicles, merge), reflective markers to indicate steep edge. Locate warnings at points considered appropriate by good engineering practice	(a) YES	(a) Minimal	(a) GRD	(a) GRD	

Table - ENVIRONMENTAL MONITORING PLAN

Phase	What is to be monitored	Where	How is the parameter to be monitored/ type of monitoring equipment	When is the parameter to be monitored	Why is the parameter to be monitored	Cost		Responsibility	
						Install	Operate	Install	Operate
Construction									
<u>MATERIAL SUPPLY</u>									
(a) Asphalt Plant	(a) [NEAA] approval or valid operating license	(a) NA	(a) GRD Supervision Consultant	(a) At start of contract	(a) Assure plant compliance with environment, health and safety requirements of Albania	(a) NA	(a) NA	(a) Asphalt Plant Owner	(a) Asphalt Plant Owner
(b) Stone Quarry	(b) See (a)	(b) NA	(b) GRD Supervision Consultant	(b) At start of contract	(b), (c) and (d) Assure that contractor has relevant permissions for material extraction	(b) NA	(b) NA	(b) Quarry Owner	(b) Quarry Owner
(c) Sand/Gravel	(c) See (a)	(c) NA	(c) GRD Supervision Consultant	(c) At start of contract		(c) NA	(c) NA	(c) Sand/Gravel Contractor	(c) Sand/Gravel Contractor
(d) Borrow pits	(d) See (a) plus restoration at end of Contract	(d) Borrow pit sites	(d) GRD Supervision Consultant	(d) At any time borrow pits are proposed		(d) NA	(d) NA	(d) Construction Contractor	(d) Construction Contractor
<u>MATERIAL TRANSPORT</u>									
(a) Asphalt	(a) Truck load covered or wet	(a) Job site	(a) GRD Supervision Consultant	(a) After work starts-several unannounced inspections	(a) Assure Contractor complies with requirement	(a) NA	(a) Small	(a) NA	(a) GRD Regional Maintenance Department + GRD Supervision Consultant

Phase	What <i>is to be monitored</i>	Where	How <i>is the parameter to be monitored/ type of monitoring equipment</i>	When <i>is the parameter to be monitored</i>	Why <i>is the parameter to be monitored</i>	Cost		Responsibility	
						Install	Operate	Install	Operate
Construction									
<u>MATERIAL TRANSPORT</u>									
(b) Stone	(b) Truck load covered or wet	(b) Job site	(b) GRD Supervision Consultant	(b) After work starts-several unannounced inspections	(b) Assure Contractor complies with requirement	(b) NA	(b) Small	(b) NA	(b) See (a)
(c) Sand/Gravel	(c) See (b)	(c) See (b)	(c) See (b)	(c) See (b)	(c) See (b)	(c) NA	(c) Small	(c) NA	(c) See (a)
(d) Traffic Management	(d) Hours and routes selected	(d) See (b)	(d) See (b)	(d) See (b)	(d) See (b)	(d) NA	(d) Small	(d) NA	(d) See (a)
<u>CONSTRUCTION SITE</u>									
(a) Noise	(a) Noise levels	(a) At site or nearest homes	(a) Sound level detector (dB[A] meter)	(a) Once/week- (AM-PM) and when locals complain	(a) Ensure noise levels at acceptable level	(a) NA	(a) NA	(a) NEAA	(a) MEFWA + GRD Supervision Consultant
(b) Dust	(b) Air quality (dust)	(b) At site	(b) Visual	(b) During material delivery and construction	(b) Ensure dust levels kept to a minimum	(b) NA	(b) NA	(b) NEAA	(b) See (a)
(c) Traffic Disruption (during construction)	(c) Traffic patterns + preparation of traffic management plan	(c) At or near site	(c) Approval of TMP and observation by GRD Supervision Consultant	(c) TMP as necessary + once/week at peak and non peak periods	(c) Ensure contractor's vehicles not causing congestion	(c) NA	(c) NA	(c) NA	(c) GRD Regional Maintenance Department + GRD Supervision Consultant

Phase	What <i>is to be monitored</i>	Where	How <i>is the parameter to be monitored/ type of monitoring equipment</i>	When <i>is the parameter to be monitored</i>	Why <i>is the parameter to be monitored</i>	Cost		Responsibility	
						Install	Operate	Install	Operate
Construction <i>CONSTRUCTION SITE</i>									
(d) Vehicular/ Pedestrian Safety (after hours when there is no construction activity)	(d) Visibility and appropriateness + traffic management plan	(d) At or near site	(d) Approval of TMP and observation by GRD Supervision Consultant	(d) TMP as necessary + once/week during evening	(d) Ensure contractor's works not causing traffic safety problems	(d) NA	(d) NA	(d) NA	(d) GRD Regional Maintenance Department + GRD Supervision Consultant
(e) Water Pollution (from Improper Materials Storage/ Management)	(e) Water quality (primarily suspended solids)	(e) Runoff from site or materials storage areas	(e) Observation by GRD Supervision Consultant + water sample collected for analysis if necessary	(e) During precipitation (rain, snow etc.) and periodically during storage period	(e) Ensure contractor's works materials not causing water pollution	(e) NA	(e) NA	(e) MEFWA	(e) MEFWA + GRD Supervision Consultant
(f) Sediment runoff	(f) Water quality (primarily suspended solids)	(f) Runoff from site	(f) Observation by GRD Supervision Consultant + water sample collected for analysis if necessary	(f) During occurrence of sediment runoff	(f) Ensure contractor's works not causing water pollution	(f) NA	(f) NA	(f) MEFWA	(f) MEFWA + GRD Supervision Consultant

Phase	What <i>is to be monitored</i>	Where	How <i>is the parameter to be monitored/ type of monitoring equipment</i>	When <i>is the parameter to be monitored</i>	Why <i>is the parameter to be monitored</i>	Cost		Responsibility	
						Install	Operate	Install	Operate
Construction <i>CONSTRUCTION</i> <i>SITE</i>									
(g) Protection of water resources	(g) Water quality of water resource (major cations & anions, BOD, COD, heavy metals, oil and grease)	(g) At resource location	(g) GRD Supervision Consultant to collect water sample for analysis as necessary	(g) Water samples to be taken monthly and analysed by competent laboratory	(g) Ensure water resources not polluted by the works	(g) NA	(g) Small	(g) MEFWA	(g) MEFWA + GRD Supervision Consultant
(h) Archaeological finds	(h) Archaeological finds to be reported	(h) At site	(h) Observation by GRD Supervision Consultant and notification to Archaeology Department	(h) At time of discovery	(h) Archaeological finds to be reported by Contractor	(h) NA	(h) NA	(h) MEFWA	(h) MEFWA + GRD Supervision Consultant
(i) Construction camps	(i) Location of construction camps to approved by Local Authority	(i) At site	(i) GRD Supervision Consultant	(i) At start of contract	(i) Ensure contractor's choice of location for camps is approved by Local Authority	(i) NA	(i) NA	(i) MEFWA	(i) MEFWA + GRD Supervision Consultant

Phase	What is to be monitored	Where	How is the parameter to be monitored/ type of monitoring equipment	When is the parameter to be monitored	Why is the parameter to be monitored	Cost		Responsibility		
						Install	Operate	Install	Operate	
Construction	<u>WASTE</u> <u>DISPOSAL</u>									
	(a) Construct- ion debris (including contaminated soils)	(a) Surplus or unsuitable materials to disposed of in authorised tips	(a) At authorised/ licensed tips	(a) GRD Supervision Consultant	(a) At time of disposal	(a) Ensure correct disposal of waste and hazardous materials	(a) NA	(a) Small	(a) MEFWA	(a) MEFWA + GRD Supervision Consultant
	(b) Solid waste	(b) Solid wastes to disposed of to authorised receivers	(b) At authorised/ licensed tips	(b) GRD Supervision Consultant	(b) At time of disposal	(b) Ensure correct disposal of waste materials	(b) NA	(b) Small	(b) MEFWA	(b) MEFWA + GRD Supervision Consultant
	<u>EROSION</u> <u>PROTECTION</u>									
	(a) Risk of bank erosion	(a) Effectiveness of gabions	(a) Along alignment	(a) GRD Supervision Consultant	(a) 1 – 2 times a year	(a) Ensure gabions are effective	(a) NA	(a) NA	(a) MEFWA	(a) MEFWA + GRD Supervision Consultant
<u>SOIL</u> <u>PROTECTION</u>										
(a) Loss of topsoil	(a) Storage/ rapid reestablishment of bare ground	(a) Within construction areas	(a) GRD Supervision Consultant	(a) Several unannounced inspections	(a) Retain topsoil and prevent erosion	(a) NA	(a) Small	(a) MEFWA	(a) MEFWA + GRD Supervision Consultant	

Phase	What is to be monitored	Where	How is the parameter to be monitored/ type of monitoring equipment	When is the parameter to be monitored	Why is the parameter to be monitored	Cost		Responsibility	
						Install	Operate	Install	Operate
Construction									
<u>CULTURAL HERITAGE</u>									
(a) Archaeological finds	(a) Any river valley tumuli and relics of significance	(a) Within construction areas	(a) GRD Supervision Consultant	(a) Several unannounced inspections	(a) Ensure finds are reported	(a) NA	(a) Small	(a) The Institute of Monuments	(a) The Institute of Monuments, (a dependency of the Ministry of Culture) + GRD Supervision Consultant
<u>PROPOSED SPECIFIC MITIGATION MEASURES</u>									
(a) Adoption or installation of measures	(a) Adoption or installation of specific measures (a) to (z) in EMP.	(a) Within construction areas	(a) GRD Monitoring Team and the Supervision Consultant	(a) Constantly	(a) Ensure that the proposed specific mitigation measures are adopted or installed.	(a) NA	(a) Small	(a) GRD Monitoring Team and the Supervision Consultant	a) GRD Monitoring Team and the Supervision Consultant

Phase	What <i>is to be monitored</i>	Where	How <i>is the parameter to be monitored/ type of monitoring equipment</i>	When <i>is the parameter to be monitored</i>	Why <i>is the parameter to be monitored</i>	Cost		Responsibility	
						Install	Operate	Install	Operate
Operation <u>Maintenance of Constructed Road</u> (a) Noise	(a) Noise levels	(a) At site or nearest homes	(a) Sound level detector (dB[A] meter)	(a) During maintenance activities or when locals complain		(a) NA	(a) NA	(a) MEFWA	(a) MEFWA
	<u>Road Safety</u> (a) Landslides, land erosion, hazardous conditions	(a) Condition of hazard signs	(a) Along highway segment included in project	(a) Visual Observation	(a) One - two times/year		(a) NA	(a)NA	(a) NA