

Environmental Management Plan

1 INTRODUCTION

1. The Environmental Management Plan (EMP) documents the impacts identified in the EIA report, the actions required to mitigate those impacts to acceptable levels in accordance with the Georgian legal requirements and the ADB safeguard policy, and the monitoring activities that are to be undertaken as part of the project to confirm that the mitigation actions have been effective in achieving their objectives or to initiate corrective actions required.
2. The EMP also details the institutional arrangements and capacities that currently exist, or that will be put in place as part of the project implementation, to ensure that the environmental due diligence (including the EMP) has comprehensively considered both the national and ADB requirements for environmental protection, has identified all likely environmental impacts and proposed appropriate mitigation measures, and has the systems in place to ensure that effective procedures for environmental monitoring and control of the project impacts and mitigation measures are implemented throughout the life of the project.
3. The environmental impacts associated with project have been detailed above in the chapter E of this IEE. Mitigation measures required to address the impacts identified in the IEE have been summarized in each of the relevant sections covering the physical, biological and socio-economic environment affected by the project (chapter E). The impacts identified and the specific mitigation measures proposed to address them have been consolidated into the environmental mitigation plan presented in Tabel in a form of matrix, which includes time frames, responsibilities and where applicable, estimated costs for each measure.
4. The environmental mitigation plan specifies the need for the civil works Contractor to provide its own detailed Site Specific Environmental Management Plan (SEMPs,) based on current EMP, but supplemented with the description of the schedule of planned activities, persons responsible for implementation of EMP and monitoring, as well as with method statements for spillage control and construction waste management.
5. An environmental monitoring plan is presented in Table 50, which outlines the activities and responsibilities associated with monitoring the effectiveness of the proposed mitigation plan and ensuring compliance with the recommendations of the IEE.

2 IMPLEMENTATION ARRANGEMENTS AND RESPONSIBILITIES

6. The main institutions that will be involved in implementation of the SEMP and monitoring are the executing agency (EA), the Supervision Consultant (SC) the Contractor and to a lesser extent the Ministry of Environmental Protection and Agriculture. EA and SC are responsible for ensuring monitoring of the project

implementation at the construction stage, while RDMRDI for monitoring at the road operation stage. Ministry of Environmental Protection and Agriculture has the authority for periodic audits but should not be considered as a party responsible for monitoring according to this IEE and EMPs.

7. MDF as the executing agency will be responsible for the day to day management of the project including implementation of the SSEMP. Management of environmental issues is carried out by the MDF through Environmental and Resettlement Unit, established in October 2014. From that time, number of Environmental and Resettlement team members has increased from 6 to 9 and currently consists of: Head of Unit, 4 environmental safeguards specialists, one safety specialist, one social safeguards specialist, 4 resettlement specialists and two ADB's individual consultants (one on resettlement issues and the other for environmental matters), who also are the members of Environmental and Resettlement Unit.
8. The MDF's Environmental and Social Specialists responsibilities in respect of implementation of the SEMP are as follows:
 - Ensure that all relevant EMP requirements (including environmental designs and mitigation measures) are duly incorporated into the project bidding documents;
 - Ensure that Contractor obtains necessary permits and/or clearance, as required, from MoENRP and other relevant government agencies. All necessary regulatory clearances should be obtained before commencing any civil work on the project;
 - Ensure that contractors have access to the EMP and IEE report;
 - Ensure that contractors understand their responsibilities to mitigate environmental problems associated with their construction activities and facilitate training of their staff in implementation of the EMP;
 - Approve the Site-Specific Environmental Management Plan (SSEMP) prepared by the Contractor before he takes possession of construction site;
 - Monitor the contractor's implementation of the SEMP in accordance with the environmental monitoring plan;
 - Prepare and submit semi-annual Environmental Monitoring Reports to ADB;
 - In case unpredicted environmental impacts occur during the project implementation, prepare and implement as necessary an environmental emergency program in consultation with MoENRP, any other relevant government agencies, and ADB;
 - Ensure that Contractor hires specialized companies to manage asbestos waste disposal and safe operations on dismantling, transportation and storage of oil contaminated equipment of gas filling stations. The other choice is to request Construction Contractor to hire the mentioned waste and pollution Management Company and to insert this requirement in Civil Works Contract.
9. The supervisor company (SC) of works commissioned by MDF is responsible to establish strong field presence in the Project area and keep a close eye on the course of works. Along with ensuring consistency with the design and ensuring quality of works, the supervisor is mandated to track implementation of EMP by the contractor, reveal any deviations from the prescribed actions, as well as.
10. The SC will include a part time international environmental specialist (1 month) and fulltime site-based national environmental specialist to assist the EA supervise and monitor implementation of the EMP during construction.

11. A Non-Compliance Notice will be issued to the contractor if the SC requires action to be taken. The contractor will be required to prepare a corrective action plan which is to be implemented by a date agreed with the SC. Non-compliance will be ranked according to the following criteria:

- Non-Compliance Level I: A situation that is not consistent with requirements of the EMP, but not believed to represent an immediate or severe social or environmental risk. Repeated Level I concerns may become Level II concerns if left unattended. •
- Non-Compliance Level II: A situation that has not yet resulted in clearly identified damage or irreversible impact, but which demonstrates potential significance. Level II requires expeditious corrective action and site-specific attention to prevent severe effects. Repeated Level II concerns may become Level III concerns if left unattended;
- Non-Compliance Level III: A critical situation that will result in significant social or environmental damage occurring or a reasonable expectation of very severe impending damage. Intentional disregard of Non-Compliance Notices or specific prohibitions is also classified as a Level III concern.

12. The failure to prepare a corrective action plan or to implement it within the required timeframe will result in the Employer undertaking the work at the Contractor's expense (as will be specified in the Contract).

13. Construction contractor is obligated to follow EMP and good construction practice. In order to meet this obligation, a contractor shall establish environmental management team and procedures.

14. The Contractor will appoint a full time Environmental Manager (EM) to be a senior member of the construction management team based on site for the duration of the contract. The EM shall have a university degree (preferably at Masters level) in Environmental Science or related discipline and have at least 10 years work experience in environmental management of infrastructure projects. In case if according to CW Contract, the engagement of specialized waste and pollution management company is responsibility of Contractor, they will ensure financing and arrangement of related contracts and supervise the activities of waste operator.

15. Key responsibilities of the Contractor (through the EM) are as follows:

- Preparing the Specific Environmental Management Plan (SEMP) for endorsement by Supervision Consultant and approval by the Employer (EA) prior to the Contractors taking possession of the construction site (see below);
- Ensuring the SEMP is implemented effectively throughout the construction period. (iii) Coordinating community relations issues through acting as the Contractor's community relations focal point (proactive community consultation, complaints investigation and grievance resolution)
- Establishing and maintaining site records of: (i) weekly site inspections using checklists based on SEMP; (ii) environmental accidents/incidents including resolution activities; (iii) environmental monitoring data; (iv) non-compliance notifications issued by the SC; (v) Corrective action plans issued to the SC in response to non-compliance notices; (vi) Community relations activities including maintaining complaints register; (vii) Monitoring reports; (viii) Routine reporting of SEMP compliance and community liaison activities (see below); (ix) Adhoc reporting to the Employer's Engineer of environmental incidents/spillages including actions taken to resolve issues of Specific Environmental Management Plan (SEMP).

16. Following the award of the contract and prior to construction commencing the Contractor will review the EMP and develop this into a detailed Specific Environmental Management Plan (SEMP) that amplifies the conditions established in the EMP that are specific for the project, the tasks involved and schedule of construction activities. The SEMP will identify persons who will be responsible for supervising the work within the contractor's team. The SEMP will include a matrix of mitigation measures corresponding to specific activities. As a stand alone documents the SEMP will be supplemented with method statements for spillage control and construction waste management. The spillage control method statement includes proper location and organization of fuel storage, filling stations and vehicle washing sites.
17. The SEMP will also include a monitoring plan and a reporting program corresponding to the requirements of the EMP. The SEMP will be submitted to EA for approval at least 10 days before taking possession of work site.
18. In addition to creating the SEMP additional topic specific EMPs will be developed by the contractor (e.g. waste management plan, traffic management plan, oil spill management plan, camp management plan, etc.). In addition, at key locations a location specific EMP may also be developed.

Traffic Consultant

19. A 7-phase construction plan is developed within the scope of the project. The major goal of this plan is to avoid any obstruction or stop of traffic in the project zone. The developed plan is more a primary document and needs further elaboration by the specialist with the relevant international qualification.
20. Prior to the onset of the construction, the Construction Contractor must hire a consultant or a group of consultants with international qualification to prepare the Traffic Management Plan. The developed plan must be agreed with the supervising company. The construction permit will be issued only if the plan developed by the Construction Contractor is approved by the supervising company and MDF. In case of absence of such a plan, the Construction Contractor will not be allowed to start the works

Site Induction

21. Following approval of the SEMP by the EA, the Contractor will be required to attend a site induction meeting with the SC's International Environmental Specialist whereby the SEMP is confirmed with the Contractor to ensure that all compliance conditions are clearly understood. Following confirmation of the SEMP with the Contractor the SC's International Environmental Specialist advises the SC Team Leader that the Contractor is now cleared to take possession of the Site and may commence moving equipment to the Site.
22. The Contractor will be responsible for ensuring that all sub-contractors abide by the conditions of the SEMP.

Reporting

23. Bi-annual Environmental Monitoring reports (EMRs) to be submitted within 1 month at the end of each reporting period. Quarterly project progress reports also should have a section on environmental safeguard compliance. Bi-annual EMRs should be a concise report in respect of compliance with EMP/SEMP requirements that will be submitted by the EA with assistance from the SC

24. The report will contain the following sections.

- Details of any environmental incidents;
- Status of all non-conformance identified during audits and inspections that are identified by non-compliance notices;
- Complaints from the public and proactive community relations activities;
- Monthly Accident Report;
- Waste volumes, types and disposal;
- Details of any contaminated areas that have been identified and rehabilitated;
- Details of any archaeological discoveries;
- Details of any ecological issues;
- Other relevant environmental issues;
- Action plan for corrective measures.

25. The Contractor will have a duty to immediately report to the SC if any serious environmental breach has occurred during construction e.g. clearing of sensitive areas, serious oil spills etc.

26. The SC provides EA with monthly reports including review of the environmental and social aspects of the Contractor's performance, as well as HSE issues. In case of any serious accident or repeated violation requiring immediate reaction of the EA and authorities, SC sends appropriate notice to EA immediately.

27. MDF as the Executing Agency will submit quarterly reports to ADB reflecting project progress and compliance with the safeguards requirements. The quarterly reports will include SC monthly reports and short explanatory not of MDF specialists.

28. ADBs responsibilities in regard to implementation of environmental safeguards requirements for the 7project include: undertaking of occasional auditing of the SEMP implementation and due diligence as part of an overall project review mission; and if required, provide advice to MDF in carrying out its responsibilities to implement the SEMP for the project. Institutional Capacity Building Requirements for MDF.

29. Within MDF, is the environmental and social specialist and several monitoring officers are included in the staff. Although day-to-day quality control of works will be outsourced to the engineering supervisor of works, MDF should have in-house human resources to oversee performance of such technical supervisor and to work out decision to address issues which the supervisor may bring up for MDF's attention.

Environmental documents and records

30. It may be said that an important and perhaps, absolutely necessary mechanism of SSEMP realization is putting the relevant environmental documents to order and ensuring their permanent update. After identifying the Construction Contractor and issues of construction organization, the MDF of Georgia, in line with the national legislation, is obliged to develop the following environmental documents and submit them to the MoEPA to reach an agreement:

- Technical report of the stationary sources of harmful substances emitted into the atmospheric air (if necessary);
- Detailed plan of waste management;
- Documents envisaged by the terms of the Permit issued under the conclusion of the ecological expertise (quarterly reports of the environmental monitoring and the like may be implied);
- Due diligence report for new/existing quarry sites. Approved by the MoESD;
- Due diligence report for inert waste disposal approved by the engineer and local government (in case of necessary).

31. The Construction Contractor must be engaged in the development of all above-listed documents.

32. On its turn, the contract concluded with the Builder must envisage his obligation to submit and agree the following documents and records to the Client:

- Traffic management plan;
- Health and safety site-specific management plan;
- Noise site-specific management Plan;
- Emergency response plan.

33. In addition, the Implementer (and the Construction Contractor on his errand) shall keep and use the following records in practice during the construction:

- Plan and schedule of the works to accomplish;
- List of the machines and equipment needed for construction;
- Records related to the occurring environmental problems;
- Records about the waste management issues;
- Written marking of the areas of waste disposal and waste transportation instructions issued by the local authority;
- Records about the supplies of necessary materials and their consumption;
- Complaints log books;
- Incident registration logs;
- Reports about the correction actions;
- Logs of equipment control and technical maintenance;
- Reports about the personnel training.

3. COSTS OF IMPLEMENTATION

34. The costs of environmental activities associated with the construction (244 300) will be included in the contract for 141 000 civil works Contractor, and 94 000 GEL in contract with the Supervision Company (Engineer). 9000 GEL will be required for MDF capacity building (additional personnel and trainings). In total the planned environmental activities will cost around 244 300 GEL.
35. **Waste Management.** According to new GEO Law on “Waste Management Code” (Article 14-Waste management Plan of the Company), Contractor have to prepare Waste Management Plan of the Company (describing in details hazardous waste management) and submit it to the MOEPA for approval. In addition, according to the same law (article 15) – the Contractor should hire Environmental Manager, whose name will also be submitted to the MOEPA.
36. Within the scope of the project, no great amounts of waste are expected to originate following the scales and duration of the project. However, at the stage of the planned relocation or replacement of the existing infrastructure, the waste amount may increase significantly.
37. The exact portions of the infrastructure to relocate or replaced cannot be identified until the relocation process of the existing underground infrastructure starts. During the replacement, it is clear that the amount of waste will increase. Besides, the current state of the pipes is not known either and leakages due to the damaged pipes are not excluded, what in case of sewage pipes, will increase the volume of the polluted soil. A hazardous waste management plan is desirable to incorporate in the budget right at the given stage.
38. **Noise:** The level of noise exceeds the admissible standards even today. Consequently, all mitigation measures given in the document will be necessary to undertake so that the noise level should not increase further. Consequently, the Construction Contractor must undertake permanent noise monitoring. In addition, temporary noise barriers will be necessary to install at the construction objects.
39. **Emissions:** The levels of CO₂, NO₂, SO₂emissions in the air are close to the admissible standards and sometimes exceed them. The emissions will increase after bringing the heavy techniques to the project zone. Permanent emission monitoring by the Supervising Consultant is necessary. Mitigation measures will include:
- Damping down using water bowsers with spray bars or other technical means;
 - Materials transported to site will be covered/ wetted down to reduce dust. The construction site will be watered as appropriate. Protective equipment will be provided to workers as necessary.
 - All vehicles will be checked and repaired in case of need to eliminate increased emission due to damaged parts;
 - Sheeting of construction materials and storage piles; and
 - Use of defined haulage routes and reductions in vehicle speed where required. Materials will be transported to site in off peak hours;
 - The construction works are to be prohibited from 8:00 pm to 8:00 am

Occupational and Community H&S

40. The Contractor shall hire a qualified health and safety expert who will provide safety training to the staff according to the requirements of the individual work place. Prior to the commencement of works, the work site personnel shall be instructed about safety rules for the handling and storage of hazardous substances (fuel, oil, lubricants, bitumen, paint etc.).

Water Sources

41. During the construction phase the Contractor will be required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage to properties and land by flooding and silt washed down from the works. Should any operation being performed by the Contractor interrupt existing irrigation systems, the Contractors will restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption. The Contractor will also be responsible for ensuring that no construction materials or construction waste block existing drainage channels within the Project corridor. The Engineer will be responsible for routine monitoring of drainage channels to ensure they remain free of waste and debris.

Staff:

42. The Contractor will appoint a full time Environmental Manager (EM) to be a senior member of the construction management team based on site for the duration of the contract.
43. In case if according to CW Contract, the engagement of specialized waste and pollution management company is responsibility of Contractor, they will ensure financing and arrangement of related contracts and supervise the activities of waste operator.
44. The SC's will appoint a Part time International Environmental Specialist.
45. Topsoil storage. 6,00m³ of topsoil will be stripped and stockpiled. Cost of these operations equal 600m³ x 10 Gel = 6,000 GEL.

Table 1: Costs of Implementation

Items	Cost (GEL)	Budget line
Mitigation measures		
Temporary sound barriers to be used on construction sites (120m x 2m)	30,000	CW
Speed control facilities (signs)	2000	CW
Flickering traffic light designed on urban boulevard	3000	CW
Topsoil temporary storage - 600 m ³	6000	CW
Polluted Soil Management	100 000	CW

Restoration	2400	CW
Monitoring		
HSE Personnel (local and International)	25 000	CW/SC
Device for dust measurement	3500	SC
Sound meter	800	SC
Training and Capacity Building		
Noise Training Programs for Contractors	3 000	CW
HSE for contractor	3,000	SC
Training of MDF personnel	3,000	MDF management
Training of RD personnel (Noise and Vibration)	6,000	CW

Table 1: Environmental Management Matrix: Pre - Construction Phase

Negative impact	Mitigation measure	Supervising body	Approximate value
Emissions of harmful substances into the atmospheric air, propagation of dust, noise and vibration	1. Selecting the sites for construction camps and concrete unit far from the settled area. The stationary sources of pollution are recommended to place in the initial part of the project corridor. 2. The sources of emission and noise must be placed as far as possible from the surface water zones;	SC	Extra costs may be associated with the greater distances of transportation of inert materials; however, these costs will not be too great.
Disturbance of the stability of the geological environment	3. Selecting geologically stable areas with least possible inclination for topsoil disposal.	„-----“	
Impact on private property/ business	4. Developing the Resettlement Action Plan and giving out compensations/compensating the damage.	„-----“	Costs may be associated with hiring the consultant
Impact on traffic flows	5. Developing the traffic management plan to consider the interests of the local people.	„-----“	To be considered in the total contract value
Preparation SEMP	6. Developing the SEMP	CW	To be considered in the total contract value
Preparation of topic specific Noise Management EMP	7. Developing the SEMP	CW	To be considered in the total contract value

Table 2: Construction stage

Type of work	Location	Expected negative impact	Mitigation measure	Responsible entity	Controlled by
<p>Preparatory works: mobilization of the temporal infrastructure, transport and construction appliances and equipment and mechanisms needed for construction.</p>	<p>The area of the construction camps</p>	<p>Emissions of harmful substances into the atmospheric air, propagation and noise propagation</p>	<ol style="list-style-type: none"> 1. Equipping the concrete unit with relevant air-cleaning systems. 2. Making noise-protection barriers if necessary between the noise sources and the receptors (population). 	<p>Construction Contractor</p>	<p>SC</p>
		<p>Risks of pollution of surface and ground waters and soils</p>	<p>Use of non-faulty construction techniques and vehicles.</p> <p>The machines/equipment and potentially polluting materials will be placed far from the surface water objects, in the areas protected against the atmospheric precipitations.</p> <p>Equipping the territory with sewage, storm-water and treatment systems at the initial construction stages.</p> <ol style="list-style-type: none"> 3. Limiting the perimeter of the oil products supply reservoirs to prevent the propagation of the pollutants in case of emergency spills. 4. Discharge of any kind of untreated wastewater into the rivers is to be prohibited. 5. Making the water-proof layers over the surfaces of the storing areas. 		
		<p>Negative visual-landscape change</p>	<ul style="list-style-type: none"> • Temporal structures, materials and waste will be placed at locations far and not visible from the visual receptors. 		

Type of work	Location	Expected negative impact	Mitigation measure	Responsible entity	Controlled by
			<ul style="list-style-type: none"> • The color and design of the temporal structures will be chosen to suit the environment. • Demobilization of the temporal infrastructure and recultivation works following the completion of the works. 		
		Risks of safety of local people and personnel	<ul style="list-style-type: none"> • Use of non-faulty construction techniques and vehicles; • Fencing the camp territories right at the initial stage of the construction; • Installing the safety signs along the perimeter of the territory. • Protecting the perimeter of territory and controlling the movement of foreign people in the area. • Equipping the personnel with PPE. • Equipping the camps with first aid kits; • Ensuring electrical safety. • Keeping an incident registration log. • Personnel training at the initial stages. 	Construction Contractor	SC

Type of work	Location	Expected negative impact	Mitigation measure	Responsible entity	Controlled by
Cleaning the corridor off the vegetation cover and accomplishing the earth works. The removal of the topsoil	Project road corridor	Cutting down the vegetation cover, habitat	<ol style="list-style-type: none"> Obtaining the permit from Tbilisi Municipality Cutting down the trees and plants under the supervision of the specialists an authorized agency; The expected impact is partly compensated at the expense of recultivation and landscaping works. Protecting the project perimeter to prevent excess harm to the plants. 	Construction Contractor	SC
		Noise propagation, emissions of dust and combustion products	<ol style="list-style-type: none"> Preparing noise management EMP Use of non-faulty construction techniques and vehicles; Accomplishing the noisy works during the day as far as possible; Running the vehicle drives at minimal speed; 	Construction Contractor	SC
		Vibration	<ol style="list-style-type: none"> In vibration persists for some time at a location (but below the threshold), mitigation in the surrounding properties should be done in terms of regular consultations and disseminating information leaflets consisting of construction activities schedule 	Construction Contractor	SC
		Loss of topsoil and degradation of sites	<ol style="list-style-type: none"> Cutting the topsoil and piling it in isolation from the lower soil layer and other materials. 	Construction Contractor	SC

Type of work	Location	Expected negative impact	Mitigation measure	Responsible entity	Controlled by
			<ol style="list-style-type: none"> 2. In order to avoid the topsoil erosion, the height of fill must not exceed 2 m and the inclination of the fill slope must not exceed 45°. 3. Water-diversion channels will be made along the perimeter of the topsoil fill and will be protected against the scattering by the wind blow; 4. In case of storing the topsoil for long, measures must be taken to maintain its qualitative properties. Periodic loosening or grass sowing is meant. 		
		Risks of pollution of surface and ground waters.	<ol style="list-style-type: none"> 1. Use of non-faulty construction techniques and vehicles; 2. In case of spills of oil/lubricants, the spilled product will be localized/cleaned in the shortest possible time. 3. The appliances creating the risk of ground water pollution when in operation will be equipped with drip pans; 4. The vehicles must be preferably washed at private car washing areas; 5. Using temporal water diversion channels; 6. Filling the holes in a timely manner. 	Construction Contractor	SC
		Accidental damage to the archeological monuments	<ol style="list-style-type: none"> 1. In case of finding any strange item, stopping the works immediately and informing the technical supervisor or the Client; 	Construction Contractor	SC National Agency to

Type of work	Location	Expected negative impact	Mitigation measure	Responsible entity	Controlled by
			<ol style="list-style-type: none"> 2. Renewing the works only after the formal instruction is received from the technical supervisor or the Client. 		protect cultural environment
		Pollution of surface waters with the waters flowing out of the underpass	<ol style="list-style-type: none"> 1. Making cesspools at the underpass portals and ensuring their proper exploitation. 		
		Personnel safety risks	<ol style="list-style-type: none"> 1. Using relevant ventilation system during digging; 2. Observing labor safety rules during the drilling and explosion works; 3. Equipping the personnel with PPE; 4. Reducing the working time of the personnel in the underpass. 		
Transportation	Corridors of the roads used to transport necessary materials, temporal structures, labor and waste. The routes running near the settled areas are also significant. The	Noise propagation, emissions of dust and combustion products	<ol style="list-style-type: none"> 1. Use of non-faulty construction techniques and vehicles; 2. Limiting the driving speeds; 3. Maximally limiting the use of public roads and searching for and using alternative routes. 4. Watering the working surfaces in dry weather. 5. Duly covering the vehicle body during the transportation of dusty materials. 6. Informing the population about the forthcoming intense vehicle movement. 	Construction Contractor	SC

Type of work	Location	Expected negative impact	Mitigation measure	Responsible entity	Controlled by
	transport operations will continue for the whole construction period.	Damage to the local road surfaces	<ul style="list-style-type: none"> • Limiting the movement of heavy techniques along the public road as much as possible; Restoring all damaged road sections as much as possible to make the roads available to the people; 	Construction Contractor	SC
		Overloaded transport flows, limited movement	<ol style="list-style-type: none"> 1. Selecting an optimal bypass to the working area; 2. Installing road signs and barriers at necessary locations; limiting the movement of heavy techniques along the public road as much as possible; 3. Using flagmen in case of intense traffic; 4. Making temporal bypasses; 5. Informing the population about the time and periods of intense transport operations. 	Construction Contractor	SC
		Risks of safety of local people and personnel	<ol style="list-style-type: none"> 1. Use of non-faulty construction techniques and vehicles; 2. Driving the vehicles with admissible speeds. 3. Minimizing the use of the roads crossing the settled areas; 4. Limiting the traffic on holidays 	Construction Contractor	SC
Paving the road surface and facing works	Design corridor	Pollution of soil and surface waters	<ol style="list-style-type: none"> 1. Laying the road surface only in dry weather; 2. The road surface must be laid only by taking the relevant safety measures: the 	Construction Contractor	SC

Type of work	Location	Expected negative impact	Mitigation measure	Responsible entity	Controlled by
			materials or waste must not dissipate over the site, etc.		
Waste management	Temporal waste storage areas, transport corridors and final storage areas	Irregular propagation of waste, environmental pollution	<ul style="list-style-type: none"> • Delivering the construction and other necessary materials only in needed quantities. • Re-using the waste as much as possible, including the use of inert materials for make the roadbed. • Arranging the temporal waste storage areas and equipping them with relevant signs. • Assigning the duly qualified personnel for waste management. • Instructing the personnel. 	Construction Contractor	SC

Table 3: Operational phase

Type of work	Location	Expected negative impact	Mitigation measure	Responsible entity	Controlled by
Exploiting the road in a common mode	Along the road	Noise propagation	1. Making noise barriers in the sensitive areas;	Contractor	
		Waste propagation; propagation of oil products.	2. Regular cleaning of the roadside zone; 3. Regular cleaning and repairing of water channels and pipes	Contractor	
		Development of hazardous geo-dynamic processes	1. Monitoring the trouble-free performance of the protective engineering facilities for slopes and riverside zone and regular repairs.	Contractor	
		Emergency risks	1. Equipping the road with relevant road signs; 2. Equipping the road with the night illumination system; 3. Permanent control of the technical state of the road cover and other road infrastructure (road signs, crossings, etc.), and accomplishing the relevant rehabilitation measures immediately after any damage.	Contractor	
		Biodiversity	4. Replacing the damaged/weathered plants along the road with new ones.		
Planned repairs and preventive works	Along the road	Propagation of polluting substances (water, soil pollution) during the repairs and replacement	1. The road surface must be repaired in dry weather to avoid the pollution of the surface flow;	Contractor	

			2. In order to avoid the dissipation of the materials used to repair the damaged road sections, the relevant works must be planned in an expedient manner.		
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4 ENVIRONMENTAL MONITORING PLAN

46. As the previous chapters of the EIA report note, there are risks of certain impacts on some environmental receptors during the activity. One of the preconditions for reducing the negative nature and value is the correct management of the strict and well-planned activity under strict supervision (environmental monitoring).

498. The monitoring methods incorporate visual observation and measurements (if needed). The monitoring program describes the monitoring parameters, time and frequency of monitoring, and collection and analysis of monitoring data. The size of monitoring depends on the value of the expected impact/risk.

47 The environmental monitoring plan in the project base must cover the issues, such as:

- Assessment of the state of environment.
- Identification of the reasons for changes in the environment and evaluation of the outcomes.
- Identification of the correction measures when the target values cannot be reached.
- Regular supervision over the degree and dynamics of the impact of the activity on the environment.
- Compliance with the legal requirements for impact intensity.
- Control over the set parameters associated with significant ecological aspects.
- Prevention and timely identification of the possible violations related to ecological aspects or emergencies during the activity.

48. The following are subject to the regular observation and evaluation in the course of environmental monitoring:

- Atmospheric air and noise;
- Water;
- Soil;
- Labor conditions and meeting the safety standards, etc.

Table 4: Environmental monitoring plan in the construction phase

What? (Is the parameter to monitor)?	Where? (Is the parameter to monitor)?	How? (Must the parameter be monitored)?	When? (frequency or duration of monitoring)	Who (Is responsible for monitoring)?
1	2	3	5	6
Dust propagation, exhaust fumes	<ul style="list-style-type: none"> • Construction camps; • Construction corridors; • Transportation routes; • The nearest Buildings 	<ul style="list-style-type: none"> • Instrumental measurement (How) 	<ul style="list-style-type: none"> • Checking dust propagation – during the intense operations and vehicle movement, particularly in dry and windy weather. • Checking the technical state - at the start of the working day; • Instrumental measurement - in case there are complaints 	CS
Noise propagation	The nearest residential Business units and offices	Instrumental measurement.	Once a week in case there are complaints	CW
Traffic	Along the project alignment	<ul style="list-style-type: none"> • Visual observation; 	Permanently	CW
Engineering-	<ul style="list-style-type: none"> • Sensitive instable 	<ul style="list-style-type: none"> • Visual observation; 	Particularly after the	CS

geological stability	sections identified in the project corridor.	<ul style="list-style-type: none"> • Periodic examinations by the engineering geologist. 	periods with precipitations;	
Soil and ground quality	<ul style="list-style-type: none"> • Areas adjacent to the construction camps; • Design corridor; • Materials and waste storage areas; • Corridor of the access road 	<p>Visual observation:</p> <ul style="list-style-type: none"> • No significant oil spills are observed; • Laboratory control 	<p>Visual observation - at the end of the working day;</p> <p>Laboratory examination - in case of large oil spills</p>	<ul style="list-style-type: none"> • Visual observation - By an environmental manager • Laboratory control - with the help of the Contractor
Temporal storage of the removed ground and topsoil	<ul style="list-style-type: none"> • Construction corridor; • Ground storage areas. 	<p>Visual observation:</p> <ol style="list-style-type: none"> 3. The lower soil layer and topsoil are piled separately. 4. The height of the topsoil pile does not exceed 2 m. 5. The inclination of piles does not exceed 45°. 6. The soil is placed far from the surface water objects. <ul style="list-style-type: none"> • There are water diversion channels along the perimeter of the storage area; • The soil is stored temporarily at places preliminary agreed with the technical supervisor. 	Every day following the completion of ground works.	Environmental Manager

Vegetation cover and fauna	<ul style="list-style-type: none"> • Construction corridor 	<p>Visual observation:</p> <ul style="list-style-type: none"> • The works within the limits of the marked zone and no additional harm or plants or illegal cuttings take place. • No harm or death of animals is fixed. 	<ul style="list-style-type: none"> • Visual observation - at the end of the working day; 	By an environmental manager
Waste management	<ul style="list-style-type: none"> • Construction camps; • Construction corridor; • Temporal waste storage areas; 	<p>Visual observation:</p> <ul style="list-style-type: none"> • The sites of temporal waste disposal are assigned in the construction area and are duly marked. • The storage areas for hazardous waste are protected against the penetration of strangers and against the weather impact; • On the territory, at due locations, there are marked containers to collect domestic waste. • The sanitary condition of the territory is satisfactory – no dissipated waste is observed. • The waste is not stored on the territory for long; 	<ul style="list-style-type: none"> • Visual observation - at the end of each working day; 	By an environmental manager

	<ul style="list-style-type: none"> • Construction Contractor's office 	<ul style="list-style-type: none"> • Checking the waste registration log, • Checking the documented agreement about waste disposal 	<ul style="list-style-type: none"> • Document check - once a month 	By an environmental manager
Oils and oil products management	<ul style="list-style-type: none"> • Construction camps; • Warehousing facilities 	<p>Visual observation:</p> <ul style="list-style-type: none"> • The protected areas for oils, oil products and other liquid products marked in a due manner; 	<ul style="list-style-type: none"> • Visual observation - at the end of each working day; 	By an environmental manager
Technical state of the access roads, possibility of free movement	<ul style="list-style-type: none"> • Corridors of the transportation routes 	<p>Visual observation:</p> <ul style="list-style-type: none"> • The vehicles move along the routes specified in advance, bypassing the settled areas as far as possible. • The state of the driving routes is satisfactory. • Free movement is not limited. • Driving speeds are observed. 	<ul style="list-style-type: none"> • During the intense transport operations 	By an environmental manager
Labor safety	<ul style="list-style-type: none"> • Working area 	<p>Visual observation:</p> <ul style="list-style-type: none"> • The territory is fenced and protected against the illegal penetration of strangers, • The personnel are equipped with PPE. • The technical state of the exploited equipment and mechanisms is satisfactory. 	<ul style="list-style-type: none"> • Visual observation - before the onset of each working; 	By an environmental manager

		<ul style="list-style-type: none"> • Electrical and fire safety is ensured. • The safety, prohibiting and information signs are installed on the territory and along its perimeter. • There is a banner on the territory with the basic safety rules. • Smoking areas are specially assigned. 		
		Unscheduled control (Inspection): <ul style="list-style-type: none"> • The personnel observe the safety rules and use the PPE. 	<ul style="list-style-type: none"> • Inspection - regularly. 	By an environmental manager

Table 5: Environmental monitoring plan in the operational phase

What? (Is the parameter to monitor)?	Where? (Is the parameter to monitor)?	How? (Must the parameter be monitored)?	When? (Frequency or duration of monitoring)	Who? (Is responsible for monitoring)?
1	2	3	5	6
Hazardous geological processes	<ul style="list-style-type: none"> • Sensitive sections in the main road corridor; • Sites of the protective buildings. 	<ul style="list-style-type: none"> • Visual observation; • Controlling the efficiency of the protective buildings. 	<ul style="list-style-type: none"> • Twice a year, at the end of winter and in autumn 	Roads Department
Vegetation cover	<ul style="list-style-type: none"> • Vegetation in the RoW. 	<ul style="list-style-type: none"> • Visual observation 	<ul style="list-style-type: none"> • Several times a year; 	Roads Department

Safe drive	<ul style="list-style-type: none"> In the road corridor 	<p>Visual observation:</p> <ul style="list-style-type: none"> Checking the presence of the relevant road signs; Examining the technical state of the road cover. 	<ul style="list-style-type: none"> Several times a year; 	Ministry of Internal Affairs of Georgia
Proper operation of the drainage system	<ul style="list-style-type: none"> In the road corridor 	<ul style="list-style-type: none"> Examining the technical state of the drainage system. 	<ul style="list-style-type: none"> Several times a year; 	Tbilservice group Ltd
Waste	<ul style="list-style-type: none"> In the road corridor 	<p>Visual observation:</p>	<ul style="list-style-type: none"> On a periodic basis 	Tbilservice group Ltd