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GEORGIA: GEORGIAN SUSTAINABLE URBAN TRANSPORT INVESTMENT PROGRAM, Tranche 1

(Financed by the Asian Development Bank)

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ABBREVIATIONS

ADB	Asian Development Bank
EA	Executing Agency
EARF	Environmental Assessment and Review Framework
EIA	Environmental Impact Assessment
EIP	Environmental Impact Permit
EMP	Environmental Management Plan
EPSM	Engineering Procurement and Construction Management
GoG	Government of Georgia
SUTIP	Georgian Sustainable Urban Transport Investment Program
IA	Implementing Agency
IEE	Initial Environmental Examination
MDF	Municipal Development Fund
MFF	Multi-tranche Financing Facility
MoENRP	Ministry of Environmental and Natural Resources Protection
MoRDI	Ministry of Regional Development & Infrastructure
SSEMP	Site-Specific Environmental Management Plan

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1. PART I. INTRODUCTION

1.1. Preliminary Information

Program Background

1. Upgrading and improvement of local transport and transport-related infrastructure plays a significant role in the development of Georgia infrastructure. To this effect a number of important activities have been implemented and financed from the budget of Georgia and from other sources. Recently several significant programs, financed through state budget, loans and grants, have been implemented with this regard.

2. On 05 August, 2010 MFF - Sustainable Urban Transport Investment Program Tranche 1 Loan and Project agreements were signed between Georgia and Asian Development Bank. MFF-Sustainable Urban Transport Investment Program – Tranche 1 (SUTIP T1) includes (i) Transport Infrastructure Improvement; (ii) Institutional Capacity Development and (iii) Project Management Facility components.

3. The program will provide efficient, reliable and affordable urban transport infrastructure and services, thereby increase economic growth potential and competitiveness of urban communities, and improve livelihoods of over 1.5 million people (approx. 35% of Georgian population). The program will also: (I) improve urban, environment and communities' access to economic opportunities and to public and social services; (II) promote efficient and sustainable urban transportation; and (III) generate income and employment opportunities.

4. The environment classification for Tranche 1 is Environmental Category B, as all subprojects under SUTIP 1 were classified as category B which will not have significant irreversible or permanent negative environmental impacts during or after construction and requires preparation of Initial Environmental Examination (IEE). The environmental categorization of subprojects was conducted using ADB's Safeguard Policy Statement (2009). Required environmental assessments of sub-projects (SPs) are conducted and IEEs are prepared in accordance with Environmental Assessment and Review Framework approved for SUTIP 1 in May, 2010 and updated in April, 2015.

Program Area

5. Sustainable Urban Transport Investment program Tranche 1 includes several projects in the different municipalities of Georgia. Program aims efficient, reliable and affordable urban infrastructure development and service improvement. In effect, urban transport service will be improved, and the level of different types of public and social services will be increased.

6. Among the Sustainable Urban Transport Investment program Tranche 1 subprojects, which are ongoing now, are:

- **Tbilisi Metro Line 2 and Creation of University Station;**
- **Anaklia coastal improvement (Phase 1);**

Tbilisi Metro extension project - overview

7. Tbilisi suffers from traffic congestion and air and noise pollution, loss of green areas and degradation of historical buildings and monuments. Serving 250,000 passengers daily, the Tbilisi Metro is playing a significant role in the urban transport system and can serve as the backbone of the city's network. Tbilisi Municipality is now exploring options for expanding the network. A first phase is planned to extend the line to the station "University" at Saburtalo district, where there is a large population, significant number of students and high traffic flow. The construction of the "Delisi-University" section of the metro started in 1985 but ceased in 1993 for financial and technical reasons. In 1998 construction resumed and "Vaja Pshavela" station was opened in 2000 with only one way in operation. The remaining tunnel has been bored up to the university station, including the station shell, escalator shaft and the exits. This Project aims to resume and complete the construction of the metro tunnel along Vaja Pshavela Avenue and the "University" subway station, to benefit more than 150,000 people and increase ridership of the metro network. Total length of metro station line is 2.2km.

8. Contract was signed with EUROESTUDIO S.L. (Spain) on July 17, 2012 and included preparation of Detailed Engineering Design (DED), Bidding Documentation (BD) Package and Construction Supervision.

9. The EPCM consultant (Euroestudios) has been fielded in early August 2012. Geological surveys and investigations of the existing tunnel have been completed and used as a basis for the first draft of detailed design which has been submitted in December 2012.

10. The international independent metro specialist recruited by MDF provided comments which have been addressed by the EPCM consultant. MDF with the guidance of the independent metro specialist confirmed in June 2013 that the creation of the emergency exit recommended by the EPCM consultant is necessary and will be implemented. ADB confirmed the emergency exit is required according to international standards and best practices. The detailed design has been endorsed by MDF after all comments from Tbilisi Transport Company, MDF and ADB have been incorporated.

11. The civil works tender was first advertised in June 2014. Bid evaluation report was timely prepared by MDF with the support of the ADB project team. However, as none of the bids were technically substantially responsive, ADB Procurement Committee recommended rebidding. Invitation for bids was advertised on 14 November 2014, and deadline for submission of bids was on 23 January 2015.

12. Contract with Construction Company Cobra Instalaciones y Servicios, S.A.. Spain, Lead partner with Assignia Infraestructuras, S.A. Spain ("the Contractor"), was signed on March 26, 2015. The total budget of the project is: GEL 83,000,670.45 (Eighty Three Million Six Hundred Seventy and 45/100 Georgian Lari). The commencement date of works was established on June 20th 2015.

13. The project is divided into two main assignments:
    - The 2,6 km long (2600 m) Metro extension from Delisi Station to University Station
    - Creation of University Station and a 301 m long tunnel section for cross over and parking tracks.

14. The 2.6 km-long (2600 m) Metro Extension, from Delisi Station to University Station, consists of the following:

    - Delisi Station (total length 131 m, P.K. 56+00);

- Scissor crossing and parking tracks after the platform (total length 285 m);
- 760 m-long twin tunnels between Delisi and Vazha-Pshavela stations;
- Vazha Pshavela Station (total length 205m, P.K. 68+00);
- 760 m-long twin tunnels between Vazha Pshavela and University stations, including ventilation Shaft n.50, the by-pass galleries from the shaft to the main tunnels and a pump sump;
- University Station (total length 162m, P.K. 78+20), with the sub-station and other technical rooms;
- In the University station, it will be designed a 110 meter platform with an access by a hall located at the intersection of Vazha Pshavela Avenue and Sandro Euli Street;
- This hall is located at elevation 535 and the platforms at 487, so that descend 53 meters;
- 315 m-long section after University Station consisting of a crossover Tg 0.11, parking tracks, a service gallery connecting the station and the crossover, the ventilation Shaft n.51 and a pump sump;

15. Delisi and Vazha-Pshavela are willow stations, built as cut-and-cover structures, while University Station is a deep-mined station (about 50 m from the surface). The tunnels between Delisi and Vazha-Pshavela were constructed in cut-and cover, while the tunnels between Vazha-Pshavela and University are mined.

16. Delisi and Vazha-Pshavela stations are finished and in operation. The line between the two stations is operated on one track, since the second tunnel has been constructed but not equipped.

17. Tunnels between Vazha-Pshavela and University stations are constructed but the civil works are not finalized (watertight injections and internal finishes). The main cavern of the University Station has been constructed, together with the inclined tunnel for the moving staircase. The atrium at the surface has a single underground level, the excavation is an open-cut and the structures are partially constructed.

18. After University Station the line ends with a crossover – which is partially excavated parking tracks, chambers for pumping stations and equipment.

19. In addition to Civil Works, the following systems must be installed:
    - Permanent way,
    - Power supply substation,
    - Electromechanical equipment (tunnel ventilation, water-pump, escalators),
    - Signaling system,
    - Low voltages equipment: communication, SCADA, fare collection.

Anaklia coastal improvement project (Phase 1) - overview

20. Anaklia is a small town and seaside resort in western Georgia. It is located in the Samegrelo-Zemo Svaneti region, at the place where the Enguri River flows into the Black Sea, near the administrative border with Abkhazia. Anaklia is supposed to become a tourism center in Georgia. Anaklia infrastructure development and rehabilitation plan was announced by the Government of Georgia. Erosion processes take place on various pleases at Georgian Black Sea coastal line and Anaklia is one of them. Today this process is seriously destroyed coastline.

21. The project aims at Anaklia shoreline rehabilitation, restoration of the full profile of beaches to the possible limits (which is necessary for wave breaking and suppression of its power and assigns to the beach a function of bank protecting structure), selection of the most optimum types and design of hydro-technical coast protecting structures.

22. Coastal protection structure of underwater breakwaters, according to project design, initially was composed with 6 units (phase 1) constructed from 5 and 10 Ton tetrapods. The space between one to another breakwaters units is 90m. The length of first underwater breakwater (from Enguri river mouth to Tikori river mouth direction) is 200m, the length of the second underwater breakwater is 300m.. Therefore, total length of underwater breakwater is 500m. Length of artificial nourishment is 2,300m. Amount of Sand for phase 1 is 50,000 m^3. Total Width of artificial nourishment is 60m, from beach line to land side is 40m and forward to seaside is 20m. Slope of beach line will be composed with 1:20.

23. Infrastructure improvement will support infrastructure investments to rehabilitate, improve and expand the beach of Anaklia and will benefit accrue principally from the protection of land and infrastructure from erosion and damage, the avoidance of some other costs and increasing number of tourists. For the interventions, benefits arise from the protection of (i) rural land, (ii) houses (iii) roads and other infrastructure. Coast protection measures need to be taken to protect the unique place and landscape. The design of approximately 4 kilometers of coastal line will create a new and attractive tourist destination on the Black Sea Coast, able to be the engine of the development of the region of Zugdidi, Ganmukhuri and Anaklia.

24. Significant delays have been experienced in the first months of project implementation and mitigation measures had been taken and agreed between the Engineer, the Contractor and MDF. The original completion date of civil works for Anaklia phase I, was on 24 April 2014. Since that the completion date was extended three times. MDF, Engineer and Contractor agreed to extend the contract up to November 18, 2015; after till 30 April 2016, afterwards - up to 30 June 2016. The official period expired on the mentioned date (June 30, 2016) but according to the ADB's recommendation letter, the Client and the Engineer are discussing about the possibility to extend the Construction period till 31st of August 2017 with the specific conditions that Contractor has to follow. Particularly, Contractor has to implement 50% till end of May 2017 and another 50% - till the end of August 2017. In parallel, the Contractor has to add another setting barge to have a possibility to work on N1 and N2 underwater breakwaters at the same time.

25. Initially the Construction Volume was different, but the Georgian government came to a decision to initiate construction of a deep sea port in Anaklia close to the project site. A risk of potential overlap of the two construction sites was apparent. Therefore the scale or even expediency of the coastal protection project was open to question. In March 2016 the Ministry of Economy and Sustainable Development of Georgia provided MDF with the final coordinates of the deep sea port, which demonstrated that the port was overlapping seven breakwaters (N 3,4,5,6,7,8,and 9) out of ten planned breakwaters (from both phase). As a result MDF took decision to remove four breakwaters (3,4,5,6,) from the scope of work of the present contract (phase 1) and continue the works only for the breakwaters N1 and N 2 and placing of sand on the beach part behind these breakwaters (approximately in front of Hotels and boulevard). The rest of the works under both phases was proposed to be cancelled, through contract amendment, as approved by the MDF Supervisory Board per meeting N66 on 18 April 2016.

26. This approach was agreed with the SUTIP loan review Mission in May 2016, and an action plan was developed accordingly and agreed upon. ADB issued a "no objection" on 14 June 2016 for a contract amendment to remove the laying out activities for breakwaters No. 3 to 7 from the civil works contract No. P42414-SUTIP-ICB-1.02 for Anaklia Coastal Protection (Phase 1). As a result, the contract amount was reduced from $6.54 million equivalent (including VAT) to $4.89 million equivalent,[1] and the remaining activities include completion of breakwaters No.1 and No.2 for

[1] A "no objection" for a similar contract amendment was issued on 14 June 2016 for Anaklia coastal protection (phase 2), under SUTIP Project 3, to remove the laying out activities for breakwaters No. 8 and 9 (contract No. P42414-SUTIP3-ICB-

which 2,000 tetrapods remain to be laid out. To date, the contractor is still experiencing delays for this activity. MRDI and MDF requested the contractor to prove its capacity to install a minimum of 1,000 tetrapods by 5 October 2016. The contractor achieved only 20% of this objective by this deadline due to harsh weather conditions and use of inappropriate vessels for working in the rough sea. The contractor informed the Mission that they procured a better higher capacity vessel, which is currently in the customs for clearance.

1.2. Construction activities and projects' progress during the reporting period

Civil works at Tbilisi Metro extension subproject

27. As it was mentioned above, the commencement date of Works was established on June 20th 2015. Contractor was requested to mobilize all necessary equipment on-site. Estimated time for the completion of works is 630 days. The expected time for the end of the works is April 2017.

28. The works are in its final phase of civil works but are not yet finished, despite it was planned to be completed in July 2016. The progress has not been as desired and the Contractor is still stuck with two critical activities that have incurred already in a critical delay and suppose a real risk of non-compliance of the deadline for completion and are interfering with installations works:

Injection in main tunnels, station, ramp of escalators and shafts

29. The progress on injection works has been low during last months and is still unresolved. Water filtrations are still observed in both tunnels, station, main drainage pumping chamber and ramp of the escalators, confirming the need of more injections, and shafts N50 and N51 have not yet been started.

30. Euroestudios exposed previous months his concern about opening of new water filtrations in the area of cast-iron segments while performing cleaning works, after observing that this situation has arisen during this time.

31. Until water filtrations are not completely cut and if the tunnel completely will not dry, it cannot be considered that the activity is completed and proceed with confirmation tests to finish the activity.

32. This problem had to been resolved before September in order to not interfere and delay installations works, but it is still ongoing and not resolved yet. Therefore, there is a high risk of delay in the completion date and the Contractor must increase resources to speed up works and catch up the delays.

33. After several discussions about this critical point during Weekly Meetings with MDF, as well as in the meetings held in Madrid between MDF, Euroestudios and Contractor's top management, a specialist on injections from the Contractor came to Tbilisi, as well as a specialist of Euroestudios. He analyzed the problem and proposed a method statement to resolve this issue that to date is being performed on site and supervised by Euroestudios. Regarding this procedure, the Contractor has cleaned first of all the metal segments area bottom slab of right tunnel by sections in order to control better where the water filtrations are and at same time the effectiveness of the performed

3.01). As a result, the contract amount was reduced from $6,989,695.95 equivalent (including VAT) to $4,042,295.08 equivalent. The Contract was completed on 30 April 2016. The Hand-Over Agreement was signed on 11 August 2016.

injections. During November 2016 the Contractor has completed cement grout injections in cast-iron segments area of right tunnel and is performing resin injections. Regarding cast-iron segments area of left tunnel, following Euroestudios instructions, the Contractor is performing again cement grout injections. The Contractor's commitment is to complete injection works by January 15, 2016.

34. Still is pending to solve water filtrations in station, escalators ramp and shafts. Regarding escalators ramp it should be solved urgently because the Contractor has already started the assembly of the escalators, as it has been indicated during Weekly Meetings.

Cleaning and reparation of metal segments - the second most critical activity regarding civil works

35. The activity began with cleaning by high pressure water jet, using just one equipment. But the obtained performance was very low and affected by continuous stops due to machinery failures. Therefore, the Contractor strengthened the activity with mechanical cleaning equipment and has completed these works in both tunnels and in ramp of escalators and shaft N50.However, while cleaning new water filtrations are appearing, thus slowing down this activity and delaying more the works.

36. Up to now the Contractor has performed in left tunnel the treatment of the joints, the replacement of damaged screws and has applied the first anti-corrosive painting layer (Rust Converter), zinc epoxy painting and polyurea. In right tunnel the works has not started yet, due to ongoing injections works.

37. Bellow there are mentioned those civil works, which are almost completed:

- **University Station Surface:** The structure stage has been completed in Upper Station and exits No. 1, 2, 3 and 4. Waterproofing, masonry and urbanization works in Upper Station and exits No. 1 and No. 4 are almost completed and are being performed as well in exits No. 2 and No. 3.
- Technical Rooms: Masonry is almost completed, except in few areas. Ceiling in upper floor has been painted.
- **Substation:** Masonry phase and painting of walls and ceiling have been completed. The installation of hangers and cable trays is ongoing and almost completed in lower floor. Transformers have been delivered to the site and placed in substation. Protection Cells are on site (HV room) and they are being connected and installed. Pre-installation of feeding points, lighting points and fire detection points is ongoing.
- **The new emergency exit:** Quite advanced – 50%;
- Completed the connection under the tunnel and concrete structure and slabs. Masonry in the ventilation tunnel is almost completed.
- **Superstructure:** Superstructure works have started in November; despite they should have started in August. Delays in injections and cleaning of cast-iron segments, as well as delays in supply of rails delayed the start of this activity. During this month the Contractor has installed rails and fastenings in right and left dead end tunnels and has concreted superstructure in right dead end tunnel (PK 80+12 – 81+87). Besides, it has been pointed out the importance of using a concrete with fibers in the sections where the projected thickness (40 cm) can not be reached, following the indications given by the Supervision and regarding this issue is still pending to receive the mix design from the Contractor. Percentage of implemented works – 32%;
- Supply for Rail R-50 and 3rd Rail of contact: Rail R-50 has arrived to Tbilisi. Following the agreement with TTC, the Contractor is delivering the rails on site and installation has been started in dead end tunnels. Regarding the Contact Rail the Contractor has performed and submitted all requested laboratory tests but up to date has not yet sent the certificate from TTC accepting them and provided a delivery date. Euroestudios alerts that due to current delays on

the track assembly there would not be enough time left for installations works to meet the deadlines of the Project.

- **Tunnel Delisi – Vazha-Pshavela**: The Contractor has completed cleaning works and improved drainage system. Currently they are repairing damaged areas.
- **Escalators:** First and second escalators have been delivered on site. The other escalator has been already shipped, but has not yet been delivered on site.
- The Contractor has executed the foundations for the escalators motors, as well as the metal supports of the escalator in the ramp and has started installation and assembling on site.
- **Architecture finishes**: The Contractor submitted the detailed Architecture Proposal by the 5th August and MDF and the Tbilisi City Hall approved it. It has been requested to the Contractor a detailed Time Schedule for Procurement of the architectural materials and for executing these works, but it has not yet been received. On the other hand, the Contractor proposed to change the material for lining panels from VITREX (project) to Aluminum. After revision by Euroestudios and MDF, both have rejected this change, thus lining panels will be according to the Project (VITREX) due to its better properties and quality. Persantage of implemented works – 43%.
- **Radio Communications System:** TTC has confirmed that will proceed to update the radio communication system throughout all existent Metro line. Therefore, the planned project must be updated to fit it to their new system (TETRA) from Delisi to University Stations.
- In September the Contractor submitted to TTC its final proposal based on TETRA System and by the end of October 2016 TTC gave their no objection.
- By the end of November, the Contractor has sent the economical proposal to be discussed and currently it is ongoing.
- **Signaling:** TTC confirms that Siemens can continue developing signaling, after signing and accepting that they will fulfill all requirements given on the warranty test sheet of operation prepared by TTC. TTC agrees to collaborate with Siemens during the development of signaling, holding with them collaboration meetings, which will be necessary in order to clarify possible arisen questions for a good implementation of signaling. Percentage of implemented works – 64%;
- During the month of September 2016 a meeting was held between TTC, MDF, the Contractor and Euroestudios regarding this issue in order to set the procedure to follow for getting final proposal and no objection by TTC and it was agreed between all parties to provide a First scheme / draft proposal, where it was necessary to include the General Project, dividing it into 5 parts/phases: 1) Interlocking / Local Control; 2) Track Circuits Technology & Frequency Generators; 3) Track Equipment; 4) Switch Machine; 5) CTC. For each part/phase was requested to provide: specifications, certifications (by International Standards, including on them GOST; better if European Standards, but valid also GOST) and identification of materials/elements.
- On September 23, 2016, the Contractor submitted to TTC this First Scheme / Draft Proposal for their revision and no objection.
- On October 17, 2016, TTC submitted to the Contractor the answer to the First scheme / draft proposal and it is pending the explanations of the Contractor regarding this issue.
- On October 18, 2016, the Contractor submitted to TTC the proposal of 1) Interlocking / Local Control for their revision and no objection. Up to date TTC has not yet given an answer.
- The Contractor has changed the order of the phases of the whole proposal and finally they set as follows:
  1) Interlocking / Local Control; 2) Point / Switch Machine; 3) Track Equipment; 4) Track Circuits Technology & Frequency Generators; 5) CTC equipment.
- On November 1, 2016, the Contractor submitted to TTC the proposal of 2) Switch / Point machine for their revision and no objection.
- TTC states that Euroestudios has to check the information provided for each phase and give its no objection before they decide on the parts of the proposal.
- On November 14, 2016, Euroestudios submitted to the Contractor their comments about the first two points of the proposal. On November 24, 2016, the Contractor submitted to

Euroestudios their answer to the comments regarding the first two points of the proposal and currently they are approved.

Civil works at Anaklia coastal improvement project (Phase 1):

38. Civil works contract was signed with Modern Business Group LLC (Azerbaijan). The construction works started on July 24, 2013. According to last contract modifications agreed with the Contractor the final extension Time for Completion is determined as June 30, 2016.

39. While, all of the tetrapods are already casted and ready to be placed underwater, the marine works progress was insufficient compared to the works schedule. The project was considering construction of 6 sections of underwater breakwater structures, revetment of Enguri river left banckbank and sand nourishment of the beach line.

40. As was mentioned above, after establishment of the final coordinates of the deep-sea port, some changes were introduced in the scope of works and currently only the construction of the breakwaters N1 and N 2 are ongoing.

41. During the reporting period July – December 2016, the Contractor was working without official time extension, thus the Contractor's Interim Payment Certificate was not officially approved by the Engineer, So all the marine works they implemented can be considered as 'no performance'. Physical progress of construction works by end of December is the same as it was in June – 78,28%. Anyway, construction work activities carried out by the Contractor Company were as follows:

- Sea bottom dredging –500 m3;
- Sea bottom leveling – 500m2;

42. Contractor procures construction materials (If they require) - sand aggregates, quarry stones and etc. from the following licensed companies: Crushed rock from LTD "Pulsari", contract number HEC-09, LTD "Enguri+"-contract number -HEC-00 and "Big Energy" – contract number HEC-08/1; Sand- from company: "Lazika", Contract number HEC-12; Natural quarry stones - from company "Grupovia" – contract number HEC-07.

43. All contracts are already provided by previous EMRs.

1.3. Changes of project organization and environmental management team

44. The MDF is the projects' executing, implementing and disbursing agency. MDF has overall responsibility for the projects' management - including environmental, planning and supervision. New Executive Director of MDF Galaktion Buadze was assigned on November 30, 2016 by the Georgia*n* Prime Minister's Decree.

45. MDF is responsible for general implementation of all safeguards tasks and guarantee that potential adverse environmental impacts arising from the Projects are minimized by implementing mitigation measures presented in the environmental impact assessment ("EIA") or Initial Environmental Examination (IEE), as applicable.

46. Management of safeguards 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 13 and currently consists of: Head of Unit, 3 environmental safeguards specialists, one social and gender specialist, 6 resettlement specialists. There are also two ADB's individual consultants – one on environmental safeguards and one on resettlement issues, who are the members of Environmental and Resettlement Unit. Until October 2014, Environmental and resettlement safeguards team was consisting of 3 environmental safeguards and 2 resettlement specialists, one of which was the ADB's national consultant on resettlement issues. Environmental and Social Safeguards team had a Team Leader who was an advisor to Executive Director of MDF on environmental and social safeguards issues.

47. The Environmental and Resettlement Unit is involved in addressing of environmental and social safeguard issues throughout the entire projects' cycles. The Environmental and Social Specialists of the MDF, are responsible for management of the environmental and social aspects associated with development of all donor funded projects for which MDF is the responsible Executing Agency (EA). Local Environmental Consultant –Nino Nadashvili, was recruited in September 2015 and designated to supervise ADB projects, review the IEEs/EIAs, EMPs, and SSEMPs of projects and carry out supervision of the construction performance based on approved EMPs, EIAs, and environmental standards in accordance with ADB "Safeguard Policy Statement" (2009) requirements' and acting Georgian Legislation.

1.4. Relationship with contractors, owner, lender etc.

48. The main institutions involved in IEEs/EMPs/SSEMPs implementation and monitoring, are the executing agency (EA) - MDF, the Supervision Consultants' (SC), the Construction Contractors' and to a lesser extent the Ministry of Environmental and Natural Resources Protection and Municipal Authorities. EA (MDF) and SCs are responsible for ensuring monitoring of the projects' implementation at the construction stage. Ministry of Environmental and Natural Resources Protection has the authority for periodic audits but should not be considered as a party responsible for monitoring according to this IEE and EMPs.

Tbilisi Metro extension project

49. As it was mentioned above, MDF is responsible for general implementation of all safeguards tasks. EA (MDF) and SC (Euroestudio) are responsible for ensuring monitoring of the project implementation at the construction stage, while Tbilisi Metro - for monitoring at the metro operation stage.

50. MDF ensures availability of all environmental information and facilitates environmental supervision of the projects. The MDF's local environmental specialist's responsibilities in respect of implementation of the IEE/EMP, are to: ensure that all relevant IEE/EMP requirements (including environmental designs and mitigation measures) are duly incorporated into the project bidding documents; Assist Contractors to obtain necessary permits and/or clearance, as required, from any relevant government agencies (NEA, etc); Ensure that all necessary regulatory clearances are obtained before commencing any civil work on the project; Ensure, that contractors have access to the EMP and IEE report and 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 (SEMP) prepared by the Contractor before he takes possession of construction site; Time-to time monitor the contractor's implementation of the SEMP in accordance with the environmental monitoring plan by conducting site monitoring visits; The

MDF through its Local Environmental Consultant, reports to the ADB in every 6 months on the status of environmental compliance of construction works by preparing semi-annual Environmental Monitoring Reports. In case unpredicted environmental impacts occur during the project implementation, prepare and implement as necessary an environmental emergency program in consultation with relevant government agencies and ADB.

51. 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 and reveal any deviations from the prescribed actions.

52. The SC had a national environmental specialist –Sandro Abzianidze and an international environmental expert – Paula Fernandez to assist the EA supervise and monitor implementation of the EMP during construction activities.

53. A Non-Compliance Notice has to be issued to the contractor if the SC requires action to be taken. The contractor is required to prepare a corrective action plan which needs to be implemented by a date agreed with the SC. Non-compliance should be ranked according to the established criteria.

54. Construction Supervision Company is preparing quarterly progress reports, which cover the implementation of the SSEMP, discrepancies from the SSEMP and list all HSE relevant incidents and accidents that occur during the implementation; Submits periodic reports based on the monitoring data and laboratory analysis.

55. Construction contractor is obligated to follow EMP and good construction practice. In order to meet this obligation, a contractor has established environmental management team and procedures. The Contractor has appointed a full time Environmental Manager (EM) – Natia Karkuzaeva which is a senior member of the construction management team based on site for the duration of the contract.

56. Key responsibilities of the Contractor are preparation of the Site-Specific Environmental Management Plan (SEMP) for approval by the Employer (EA) prior to the Contractors taking possession of the construction site; Ensure that the SSEMP is implemented effectively throughout the construction period; Carry out the monitoring and mitigation measures set forth in the IEE/EMP/SSEMP; Establish an operational system for managing environmental impacts; Allocate the budget required to ensure that such measures are carried out. Construction contractor is responsible to prepare monthly progress reports on SSEMP implementation, which should contain information on the main types of activities carried out during the reporting period, status of any clearances/permits/licenses which are required for carrying out such activities, mitigation measures applied, and any environmental issues that have emerged in relations with suppliers, local authorities, affected communities, etc.

57. The contractor submits reports of the carrying out of such measures to the employer on a monthly basis; 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:

- Weekly site inspections using check-lists based on SEMP;
- Environmental accidents/incidents including resolution activities;
- Environmental monitoring data;

- Non-compliance notifications issued by the SC;
- Corrective action plans issued to the SC in response to non-compliance notices;
- Community relations activities including maintaining complaints register;
- Monitoring reports;
- Routine reporting of SEMP compliance and community liaison activities;
- Adhoc reporting to the Employer's Engineer of environmental incidents/spillages including actions taken to resolve issues.

Anaklia coastal improvement project

58. As it was already mentioned above, Construction Contractor of the project is – Modern Business Group Ltd (Azerbaijan). Construction activities are supervised by the DOHWA Engineering Co., Ltd (Republic of South Korea). Construction Contractor company has one National Environmental Specialist on site (Zurab Revazishvili). Environmental issues at Supervision Company are handled by National Environmental Specialist - Revaz Gujabidze, who is mandated to track implementation of EMP by contractor, reveal any deviations from the prescribed actions, as well as identify any unexpected environmental issues, emerged at any stage of works.

59. Construction Supervision Company is responsible for supervision of all environmental issues during project implementation. Construction contractor is obliged to follow EMP and SSEMP good construction practice during construction activities. All environmental issues, arising from the construction activities are immediately brought to the attention of MDF's environmental safeguards team by the environmental specialists of construction and Supervision Companies' in order to coordinate efforts and ensure immediate mitigation of impacts, protect the environment and safeguard the health and welfare of the local communities. The construction contractor's Environmental specialist responsible for implementation of EMP/SSEMP, daily environmental monitoring and reporting.

60. Construction contractor is responsible to prepare monthly progress reports on SSEMP implementation, which should contain information on the main types of activities carried out during the reporting period, status of any clearances/permits/licenses which are required for carrying out such activities, mitigation measures applied, and any environmental issues that have emerged in relations with suppliers, local authorities, affected communities, etc.

61. Construction Supervision Company prepares quarterly progress reports, which cover the implementation of the SSEMP, discrepancies from the SSEMP and list all HSE relevant incidents and accidents that occur during the implementation.

62. MDF ensures availability of all environmental information and facilitates environmental supervision of the projects. The MDF, through its local environmental Consultant – Nino Nadashvili, reports to the ADB every 6 months on the status of environmental compliance of construction works by EMRs.

2. PART II: ENVIRONMENTAL MONITORING

63. With reference to MFF Sustainable Urban Transport Investment Program – Tranche 1 (SUTIP T1) Environmental Assessment and Review Framework (EARF) is stated that an IEE/EMP will be a

part of the overall project monitoring and supervision and will be implemented by the Contractor with oversight from the Supervision Consultant (the Engineer) and MDF.

64. IEE/EMP is an integral part of construction contracts. MDF requires the Construction and its Supervision Companies to implement construction activities in accordance with the environmental management plan (EMP), which is the part of the initial environmental examination document (IEE).

65. Based on the IEE/EMP requirements, monitoring measures of projects includes construction site supervision, verification of permits, monitoring of compliance of the contractors' performance and specific monitoring of environmental impacts like noise, dust, soil contamination, landscape structure, construction waste, radiation, flora and fauna, water pollution, air emissions and etc. conducted by Contractor's and Engineer's environmental management specialists. Frequency of measurements of air, noise, vibration and etc. are given in **Annex 1**.

66. Environmental monitoring started immediately after the commencement of civil works under the SUTIP T1. Environmental safeguard monitoring is performed as required in the EMPs. MDF submits to ADB semiannual environmental safeguards monitoring reports, describing progress of implementation of EMPs and any compliance issues and corrective actions, within 1 month after each reporting period. If any unanticipated environmental and/or social risks and impacts will arise during construction, implementation or operation of the Project that were not considered in the IEE/ EMP, MDF ensures to promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan.

67. During reporting period, environmental aspects, provided bellow, where monitored and managed by construction and supervising companies within the projects. It should be noted that for the monitoring of air, noise, water and other parameters, during measurements, standards, provided by the Decree 297/N on "Approval of norms on environmental quality conditions" elaborated by the Minister of Labor, Health and Social Affairs of Georgia (16. 08. 2001) were used, as mentioned decree determines and approves quality norms of environmental conditions, in order to ensure the safe environment for human health.

Tbilisi Metro extension project

68. The tests taken out during reporting period are as follows:

Subterranean Water (Environmental Agency)	Air and noise (Environmental Agency)	Air and noise COBRA ASIGNIa
8/12/2016	07/07/2016	01/07/2016
	24/08/2016	08/07/2016
		15/07/2016
		05/08/2016
		12/08/2016
		19/08/2016
		26/08/2016

		2/09/2016
		09/09/2016
		16/09/2016
		24/09/2016
		07/10/2016
		14/10/2016
		21/10/2016
		10/11/2016
		17/11/2016
		24/11/2016
		14/12/2016

Air quality

69. Operation of heavy machinery, vehicles and other construction equipment result in dust generation and fugitive emissions of carbon monoxide, NOx, SO_2, hydrocarbons, and particulate matter.

70. Impact of the construction activities on air quality is minor and is easily manageable through application of good construction and vehicle/equipment maintenance practices. It is not possible to eliminate the emission of dust from a construction sites entirely. Nevertheless, mitigation measures like water spraying inside and around the construction sites, usage of only such vehicles and equipment that are registered and have necessary permits, storage of construction materials far from residential areas reduce gaseous and dust emission during construction activities, storing material on the surface in places away from where ventilation fresh air intakes could be compromised trough a surface fire or chemical spill, using a ventilation system which is monitored and upgraded to ensure air flows are always provided to the workplace, ensuring bore holes and other penetrations are sealed, monitoring air flows for explosive gases and atmosphere contaminants regularly and etc. could reduce hazards and risks of air pollution.

71. Contractor did visual control, monitored air-flows for explosive gases and specific atmosphere contaminants, Inspected mechanical ventilation system, Inspection moving and diesel machines & vehicles. CC also conducted measurements of noise and atmospheric air chemical parameters (PM, CO, NO_2 and SO_2) through Environmental Agency twice: on 07/07/2016 and 24/08/2016; (See attachment 1.1) and by own measure device - 18 times (See attachments 1.2-1.19).

72. The non-compliances of the previous period regarding the tunnel ventilation have been finally closed.

Noise and Vibration

73. The activities inside the tunnel, at the depth of 20 to 50 meters, does not generate any noise or vibration that can be perceived by people above the ground;

74. It is not possible to eliminate the emission of noise (noise produced by various equipment and activities) entirely from a construction sites, however, mitigation measures like usage of vehicles and equipment that are registered and have necessary permits, no noisy construction activities during the nights, usage of silencers, mufflers and acoustic shields on equipment, limitation of the number of machines used one and the same time, using vibration absorbing handles or rubber-type vibration insulating devices between the tool and the hands implemented by the contractor, using hearing protection for workers inside tunnels and shafts, fixing 'out-of-balance' items reduces noise levels to a moderate magnitude.

75. According to the project design scope, the use of a large tunnel boring machine is not considered because the underground structures, the excavation, the support and lining are almost fully completed and only some minor works need to be completed.

76. No vibration impacts were occurred on buildings from the demolition areas, because closest buildings are located more than 20 m away from the construction area and activities inside the tunnel were implemented in the depth of 20-50 meters. Thus, no vibration measurements were conducted during reporting period.

Vegetation and soil

77. There is no top soil in the areas where the contractor has to work. These areas are already free of topsoil.

78. No more trees has been cut since January, 2016.

Fauna

79. Fauna values in the project area are very low. Some temporary disturbance to a range of common urban fauna species (mostly birds) will occur, but the impacts are unlikely to be significant.

80. Limitation of the dust and emissions from construction machinery/vehicles especially near street trees and the parkland/green recreation area in the middle of Vaja Pshavela are used to control and reduce risks and hazards.

81. According to the IEE, a wintering colony of the Greater Horseshoe Bat *(Rhinolophus ferrumequinum)* consisting of up to 500 individuals was found in the tunnel, from the University station side. This specie is no "Least Concern" and it is not included in the Red List of Georgia. So no specific measures are required to protect this species. Noise and human presence caused bats abandon from the tunnel and search to another habitat. During reporting period it hasn't been detected the presence of Bat colony in the tunnel.

Water quality

82. The principal source of construction impacts on ground and water is related to the groundwater. As the project involves only very limited drilling works the main potential impact to these elements is that the underlying ground water and soils may be affected during the construction phase.

83. The contractor conducts the underground water chemical and microbiological tests periodically and monitors groundwater inflow if is necessary. Underground water quality test has been done on September 1, 20016. The test results (in Georgian) are provided in attachment 2.

Social affections

84. The disturbances produced by the transit of heavy vehicles on the works is minimal to the community facilities.

Cultural heritage

85. No cultural affections have been detected.

Hazardous and Non-hazardous Waste and Spoils

86. Constructions works generate different type wastes starting from garbage, recycle waste, house hold waste and construction and demolition debris, including, small quantities of hazardous waste generated mainly from the vehicle maintenance activities (liquid fuels, lubricants, hydraulic oils, chemicals and etc).

87. The most significant solid waste from the project is the construction and demolition debris, followed by spoil from excavations, which is removed from site by an approved waste management contractor.

88. Non-hazardous waste, household and solid waste is disposed to official dump site, particularly Gldani dump area by contractor "Cobra Assignia" and its sub-contractor – "Prime Concrete" Ltd., based on the contract signed by all parties (contractor, sub-contractor and solid waste company). According to the contact signed on 09.11.2015 Solid Waste Company of Georgia is serving contactor in two points (shaft 51 and shaft 50) twice a week;

89. Hazardous waste residuals such as oil, solvent, and materials used in oil spill cleanups and etc. are collected and stored on separate place with appropriate covered skips. Time to time, when it necessary (approximately once in three month) it Is passed to a licensed operator Company "Sarini", which has the permit on operation of the hazardous waste. Contract N 25022016 with Company "Sarini" was signed in February, 2016.

90. All relevant Contracts with mentioned companies were presented in previous EMRs.

91. Regarding asbestos waste, on 25.08.2016 it was disposed at Solid Waste Management Company landfill located in City Marneuli, by authorized personnel in accordance with safety regulations specified in Company Waste Management plan, prepared by Construction Contractor. Asbestos disposal acts attached to the document (See attachment 3).

General clearance

92. The general clearance of the places outside the tunnel has been improved. Inside the tunnel, the wastes have been separated and removed.

PPE

93. In general terms, personnel wear adequate PPE during the working process as per the project HSE requirements. Nevertheless, it has been noticed in different times, as it had been noticed 6 months ago, that some workers don't wear mask when it is required. It has been notified to the contactor to take the required measures to avoid it.

Anaklia Coastal Improvement project

94. Monitoring measures for Anaklia Coastal Improvement project includes construction site supervision, verification of permits, monitoring of compliance of the contractor performance and specific monitoring of environmental impacts like noise, dust, sea water quality, soil contamination, sea biodiversity, landscape structure, construction waste, radiation, flora and fauna, water pollution and air emissions, etc conducted by Contractor's and Engineer's environmental management specialists.

95. As it was mentioned above, during reporting period speed of construction works have been decreased significantly and activities implemented in a very slow pace. Because of decreasing the construction works pace and scale, the posiblility of impact level on environment has felt to minimum.

96. There are no protected areas, wetlands, mangroves, or estuaries or archeological/cultural heritage within the project area. There are no land acquisition and resettlement issues involved. The nearest residential house is located in 300-400m distance from the working yard. In order to limit soil disturbance, the access to the site was limited to construction workers and the site was fenced.

97. No adverse environmental impacts related to the construction works were noted or observed within the reporting period. Laboratory tests for the sea water and atmosperic air quality were taken on 06.10.2016 by licensed laboratory. Measurement results are provided in Attachments 4.1 and 4.2. According to data received in 06.October.2016, the obtained results did not exceed the National Environmental Standard (Maximum Permissible Level); therefore, no additional mitigations are required.

Air Quality

98. Dust was controlled through watering the access roads where driving could easily generate dust. During the transportation of contraction material, the trucks were covered with special tarpaulins or other cover means to avoid spreading of fine aggregated material in the air and although, the transportation of materials were carried out by initially selected and determined routs and the speed of the trucks are limited. Wheels and undercarriage of haul trucks were clean and washed prior to leaving construction site.

99. For ensuring compliance with established quality norms of ambient air quality air tests are taken in every 3 month. Last test was taken on 06.10.2016 (Attachments 4.1) during reporting period no problems has been detected.

Sea Water quality and sea water turbidity

100. Marine works for excavation and placing stones for leveling bottom of the sea preparing for placing TTP, have been carried out with extreme care from point of view spills, water turbidity, labor safety, taking into consideration EMP and SSEMP requirements and

regulations. Vehicles fueling place is located approximately 300 m far from sea shore, adequate lining of the ground by concrete and confinement of possible operation and emergency spills are provided.

101. Regular check-up and inspection was implementing for monitoring of sea water quality and sea water turbidity. The last laboratory test for sea water was taken on sea water was taken on 06.10.2016 (See attachment 4.2).

102. During marine works - dredging, stone filling - works were monitored by the contractor's environmental specialist was visually controlling sea water turbidity level, making test checks in every 4 hours. In case if the turbidity measured during marine works at a distance of 250 meters from the point of works exceeds the background turbidity by more than 250mg/l the Contractor will be instructed to take suitable measures to reduce the turbidity. No deviations from the standards have been identified during measuring.

Sea Biodiversity

103. During marine works, loss of Bio ecology is expected (sea plants), but because of insignificant Influence no specific mitigation measures are required. Only permanent visual control, identifying the degree of turbidity through analysis (in every 4 hrs. during the work) during the works are needed. If the degree of the water turbidity is in excess of the admissible limit (25 gr/l), the works must be stopped and relevant corrective measures must be taken. During the works on underwater breakwater N1 and N2 contractor was taking measurements for turbidity on every day basis, no problems have been detected.

Noise

104. The plan of transportation routes and timing were agreed with local Municipality and patrol police since the project has started. Wheels and undercarriage of haul trucks were checked and fixed to maintain good vehicle condition not to make any noise and not to disturbed residential people, even though there are no residential people within 1km range.

105. Drivers were informed to limit speed to 20-25 km/h to avoid use of horn in the town. Local population was informed about project works. The Contractor was working during night time to catch up schedule but according to supervisor's instruction, materials were transported during the day time. According to the works schedule, not more than 5-6 trucks were working at the same time and the noise created from them were not exceeding the limitation.

Waste

106. At construction site, produced waste was stored at special storing areas designated for hazardous, domestic and construction waste storage. The part of construction waste (inert materials) was used by contactor for secondary meanings. Regarding the hazardous waste, such as oil contaminated towels or oil contaminated soil, Contractor was accumulating them separately in special containers. Hazardous waste was removed from construction site by authorized personal only in accordance with safety regulations.

107. Contractor Company had relevant contracts with licensed companies for proper management and final disposal of waste. Construction company had signed contracts with following companies for waste removal. For hazardous waste: Ltd "Sanitari" (contract N2911-13) and "Sandasuptaveba"; For domestic waste: an agreement with Zugdidi municipality; Construction

waste: “Georgian Solid waste management company”. All contracts are already provided by previous EMRs.

Soil Contamination

108. Fuel was kept in the covered containers at the impermeable surface area. Taking into consideration the specific characteristics of coastal protection project, there is no soil contamination in the scope of project.

Flora and Fauna

109. The flora and fauna living in Samegrelo region is located out of the project area and thus the project activities has no impact on them;

110. There are no trees, vegetation, bushes, plants, land and sea animals in the project area, as sandy coasts with the hot sun, salty water and wind are not convenient environment for living organisms. Therefore, there are few living organisms on the coast surface: crawfish and low plants in the coastline. Thus, construction activities have no impact on flora and fauna.

Landscape

111. Construction activities caused some impact on the landscape of the territory. A big amount of cast tetrapods (from Phase I and Phase II) are accumulated on surrounding areas. This issue is agreed with local municipality and Contractor got the right to use additional surrounding areas for tetrapods placing.

112. At present, MDF with supervision company “Dohwa” is working on finalization of the action plan prepared for tetrapods placing and storing. Action plan will be agreed with ADB.

Social Environment

113. There is no any adverse impact on social environment as the nearest residential house is far from 300-400 m. The intensity of traffic caused by the Contractor’s transporting equipment is increased not much, around 3 trucks in every 2 hours; it means that, not air contamination or noise is caused. Only positive impact can be mentioned as the almost 90% of people employed by the Contractor Company are locals, and their living conditions have been improved.

Ground water contamination

114. The places that could be the source of ground water contamination are fenced with ground and special material. Special filter was arranged around the concrete batching plant for accumulation of contaminated water.

Construction Safety

115. Construction activities are performed in accordance to the construction safety requirements and regulations. Workers are using personal protection equipment. The project area is fenced and warning signs are placed.

Worker Camps

116. The potential impacts related to the construction and operation of the camp could be summarized as potential damage of topsoil, contamination related to fuel storage and fuelling operations, waste management, wastewater and sanitation.

117. The construction camp is equipped with a biotoilet and other necessary infrastructure. Monitoring activities are implemented by Environmental Specialists on the daily basis.

3. PART III: ENVIRONMENTAL MANAGEMENT

3.1. The environmental management system, site-specific environmental management plan (SEMP) and work plans

Tbilisi Metro extension project

118. Following the award of the contract and prior to construction commencing the Contractor has reviewed the EMP and developed this into a detailed Site-Specific Environmental Management Plan (SSEMP) that amplifies the conditions established in the EMP that are specific for the project, the tasks involved and schedule of construction activities. The draft version of SSEMP was prepared by the Contractor and sent to Supervision Consultant (SC) for endorsement on 20.06.2015. SSEMP has been further reviewed and commented for improvement by the MDF's Local environmental Consultant and ADB RETA National Environmental Consultant. It was approved by PIU/MDF in September 2015. SSEMP document was sent to ADB as well on October, 23, 2015, according to ADB requirement (Aid Memoire' (8 - 18 September 2015), Chapter IV. Follow-Up Actions, paragraph (xiv)). Table 1 below presents the information on statuses of managements' plans.

Table 1: Status of Management Plans

Management Plans	Status	Date of Submission and/or deadline	Comments
1.SSEMP	Submitted, approved	June 8, 2015	
2. Spoil disposal management plan	Has submitted as part of SSEMP of waste		
3. Emergency Response Plan	Submitted, approved	11/12/2015	
4. Evacuation structure plan	Submitted, approved	11/12/2015	
5. Company Waste Management Plan (according to GEO legislation)	Under the preparation		
6. SSEMP for wastes	Has been prepared by the Contractor and several times revised. Approved.	Last submission of updated	Revision has been implemented by the International

		document June, 2016	Environmental Specialist of Supervision Company, according to provided comments from MDF and RETA's environmental Specialists.
7. Company waste management plan - demanded by the new Waste Management Code of Georgia	Draft document was prepared and submitted by the contractor	22/12/2016	
8. Updated SSEMP	SSEMP was updated by the Supervision Company	October, 2016	Location of emergency exit has been changed and Detailed Design has been prepared and submitted to MDF for approval in September, 2016. International environmental specialist of SC has updated SSEMP in October, 2016 due to changes in the detailed design.

Anaklia Coastal improvement project

119. EEs, including EMPs, are integral parts of the contracts and their implementation is mandatory for contactors. Contractor Company, as it was mentioned above, submits monthly progress reports to supervisor Company Dohwa and MDF. Monthly report includes chapter on environmental performance. Consultant Company Dohwa prepares quarterly environmental report and submits to MDF on progress of the environmental management plan.

120. SSEMP for phase I has been prepared by Construction Company and approved by Consultant Company in June, 2014. SSEMP for phase I has been updated by the Consultant Company and updated document was presented to the MDF in June, 2015. MDF's environmental specialist reviewed updated SSEMP and has not approved it because no cumulative impacts were reflected in the document. Although, she required from Construction Company and Supervision Consultant additional explanations.

121. MDF's remarks were sent to environmental specialists of both – Consultant and Construction Companies with CC to the National Environmental Safeguards Consultant of RETA 8663 for the consideration. MDF required Consultant Company to present clarifications referring to SSEMP update. However, as the expediency of the Anaklia coastal protection project is still opened because of deep sea port project possible initiation and works are going at a very slow pace, updated SSEMP was not provided by the Contractor yet.

3.2. Site Inspection and audits

122. Site supervision and inspections, as well as monitoring of compliance of construction activities are important aspects to ensure the proper implementation of EMP/SSEMP requirements. Environmental management team of Construction and Supervisor Companies carry out permanent supervision activities and monitoring of the project performance in regular base. Time to time, MDF's environmental specialist - Local Consultant and Regional Environmental Consultant of ADB (under RETA 8663), are performing site monitoring visits as well. Basically, in every two month ADB review missions are conducted also. The schedule of conducted audits and monitoring during the reporting period is given in the Table 2, below:

Table 2: The schedule of conducted audits and monitoring during the reporting period at

Tbilisi Metro extension project

Site visits	Organization		Comments
	SC (Totally 39 visits)	MDF (Local environmental Consultant)	
Site audit	July –- **5 days -** 7;11;19; 20;21		MDF representative is permanently on site. Weekly meetings also are conducted in a permanent base. Local environmental Consultant attends

			weekly meetings and discussing pending environmental issues (emission measurements', waste management, reporting issues and etc) with Cobra and Euroestudios Top management.
Site audit	August - **12 days -** 8-17; 25; 28	3.08.2016	
Site audit	September – **6 days -** 6;7;13-16	25. 09.2016	
Site audit	October– **8 days -** 4;12;17-21;24	29. 10. 2016	
Site audit	November– **4 days -** 7;14;27-28	27.11.2016	
Site audit	December - **4 days -** 16;27-29		

123. MDF is monitoring construction progress by attending the regular weekly meetings between the Engineer and the Contractor. MDS's local environmental consultant is attending weekly meetings and requesting from the Engineer and Contractor strict and unconditional compliance with ADB requirements and Georgian legislation in terms of safety and safeguards.

124. MDF's local environmental consultant is ensuring that the Contractors understand what is to be done and how to rectify and address any environmental issues raised during project implementation process.

125. Environmental Specialist of Construction Company – Natia Karkuzaeva is permanently on site and implementing daily inspections of construction activities in regular base. Inspection is carried out by Environmental Specialist in accordance to check-lists. Completed check-lists are available at camp site.

126. Local environmental specialist Alexandre Abzianidze was recruited by the SC in January, 2016. He conducts site-monitoring visits 2-3 times per week and supervise and monitor implementation of the EMP during construction activities. He prepares monthly reports and submits to MDF.

127. The international environmental expert - Paula Fernandez of SC has implemented site inspection and audit quarterly. She has done quarterly visits and prepares the quarterly reports, the last visit was taken out in December 2016.

128. During site inspection, the international environmental expert visited the whole work area, and checked the following items:
    - **Levels of dust** -Outside the tunnel, the levels of dust weren't considered higher that without works, due to most of the activities were being done inside the tunnel.

Inside the tunnels the levels of dust, apparently, have decreased considerably during the last months

- **Compliance of the maximum high speed limit of 30 km/h** -In the work area, the vehicles were respecting the high speed limit;
- **Presence of abnormal smells -**No abnormal smells have been detected;
- **Proper waste management and cleaning of the worksite** – Inside the tunnel the situation has get worse during the last months. There is a non-compliance that hasn't been close yet;
- **Affection to flora, fauna or historical heritage**- The only flora that was seen to be affected has been the trees that were inventoried in previous reports. The cut trees had the pertinent permit. Non affected trees have been protected to avoid any damage over them.

129. During November 14-25 ADB Mission met with the contractor and the Engineer on site and visited the tunnel to examine the construction activities, which were found to be conducted in a satisfactory manner. Mission reminded that all contractual obligations should strictly be met and any cause of potential delay should be flagged upfront with appropriate mitigation measure and action plan. The MDF technical team is closely monitoring the progress including through working meetings between MDF, Engineer and Contractor that are held on a weekly basis. The Mission also reminded all parties that IPCs and WAs should be submitted on time, as Tbilisi Metro Extension is currently the highest contributor for disbursements under the Investment Program.

Anaklia Coastal improvement project

130. Nine site visits were conducted by the environmental specialist of Supervisor Company during reporting period and 3 non-compliance notices have been issued by him. All non-compliances have been fixed by the contractor in required time.

131. Environmental Specialist of Construction Company is permanently on site and implements daily inspections of construction activities on regular bases. Inspection is carried out by Environmental Specialists in accordance to check-lists. Filled check-lists are available at camp site.

132. MDF's Environmental team was ensuring that the Contractors understand what is to be done to rectify and address any environmental issues raised during project implementation process.

3.3. Non-compliance notices and corrective actions

133. Identification of problematic issues and non-compliance notice during site inspections is the responsibility of Environmental Specialists of Construction and Supervision Companies. During reporting period the number of site visits has been implemented by environmental specialists

of Construction and Supervision Companies in order to check environmental compliance of construction works.

134. In case of any deviations of EMP/SSEMP requirements corrective actions and mitigation measures are applied. All mitigation measures during pre- and construction phases of SPs are implemented by construction contractors according to EMP/ SSEMP.

135. Non-compliances observed during the reporting period, corrective actions required and their current statuses are provided below.

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Non-Compliance notices and corrective actions

Date of submission	Description of Non-Compliance	Area	Corrective action required	Performance Date of Corrective actions
29.02.2016	There is the plenty of dust in the tunnel. No good ventilation, no working of the existing several fans during construction works.	Site working area	Additional fans to be provided especially in the tunnel and the operating are mandatory all of them all times when construction works are carrying out, PPE Equipment: (respirators, eye goggles).	**CLOSED, 30.07.3016 During the period January-June, responses from the Contractor were received, but not real measures were taken. On July 30-2016 the non-compliance was closed due to the implementation of the measures**
29.02.2016	Asbestos waste is dumped near the shaft 51, It seems the broken roof sheets and inside the tunnel some demolished asbestos pipes as well. No covering, no plastic bags packaging, no temporary designated secure place storage, no sign to identify as hazardous waste and free access for tampering by unauthorized persons.	Site working area	Appropriate PPE (Respirators (negative pressure, P100 equivalent particulate filter, half-face or full-face, overalls,), protective gloves, soap, using HEPA Vacuum , air filters, providing of 6-mil plastic bags for putting the asbestos wastes there and human resources (hired some qualified sub-contractor or performing the works by the trained competent people)	**CLOSED The Contractor removed the asbestos waste from the site as per hazardous wastes removal procedures (dated: 25.08.2016) provided (delivery act, photos). Response (S -162 date: 02.09.2016)**
30.03.2016	Mixed wastes (Construction, wood, empty cement bags, etc.) and spoil were dumped near the shaft 50 area and inside the tunnel as well. Nowadays they are removed	Near the shaft 50 area and inside the tunnel as well	Contractor should provide the Wastes Transfer Notes, report with attached the wastes disposing photos.	**CLOSED (The Contractor provided the transfer notes; response S 0084.1 Date: 05.04.2016) Real implementation and data of closing the non-**

	but No any transfer Notes, No evidences to dispose on Gldani Municipality construction wastes landfill …			**compliance August 30, 2016**
25.08.2016	Household wastes are scattered in the shaft 51 area, shaft 50 yard, near temporary facility for Contractor JV Cobra Assignia personnel located in 50 shaft yard.	Shaft 51 area, shaft 50 yard, near temporary facility for Contractor JV Cobra Assignia personnel located in 50 shaft yard.	Using of appropriate PPE: (respirators, Overalls, Protective gloves) Collecting, sorting, and putting into the waste containers for temporary disposal, providing of the housekeeping on the site. It is recommended to take one waste container from the site office territory and put near the temporary facility located in shaft 50 yard.	**PENDING** **No answer from the contractor although it has been reminded several times**

Anaklia Coastal improvement project

Non-Compliance notices and corrective actions

Date of submission	Description of Non-Compliance	Area	Corrective action required including deadline	Performance Date of Corrective actions
16.09.2016	**Warning signs -** Warning signs have been damaged because of bad weather	Working yard	Warning signs need to be repaired ASAP	**Corrected on 17.09.2016.**
21.10.2016	**Waste management** - Domestic waste container has been damaged.	Working yard	Domestic waste container has been damaged, and replaced by new one.	**Corrected on 22.10.2016**
06.12.2016	**Waste management** - Domestic waste has not been removed on time.	Working yard	Domestic waste has not been removed on time.	**Corrected on 06.12.2016**

3.4. Actions taken to reflect the findings of ADB mission during reporting period

136. During November 14-25, 2016, ADB's Loan Review Mission (the Mission) visited Georgia to follow-up on implementation of SUTIP projects. The Mission met with the Ministry of Finance (MOF), Ministry of Regional Development and Infrastructure (MRDI), Municipal Development Fund (MDF), Tbilisi Municipality City Hall (TCH), Batumi Municipality City Hall, consultants and contractors, and conducted site visits in Tbilisi, Batumi and Mestia. A wrap-up meeting was held in Tbilisi with MRDI and MDF on 21 November 2016 and a debriefing meeting with MDF on 25 November 2016. The Aide Memoire (AM) summarized agreements reached and actions recommended by the Mission, and is subject to review and agreement of the higher authorities of the Government of Georgia and ADB.

Findings during the ADB Mission were as follows:

Tbilisi Metro extension project

137. The civil work contract was awarded on 26 March 2015, the commencement date of works was established on June 20th 2015. The contractor was fully mobilized in July 2015 and construction activities are conducted according to schedule which anticipates completion within 24 months. The Mission reminded that all contractual obligations should strictly be met and any cause of potential delay should be flagged upfront with appropriate mitigation measure and action plan. The Mission met with the contractor and the Engineer on site and visited the tunnel to examine the construction activities, which were found to be conducted in a satisfactory manner. MDF technical team is closely monitoring the progress including through working meetings between MDF, Engineer and Contractor that are held on a weekly basis. The Mission also reminded all parties that IPCs and WAs should be submitted on time, as Tbilisi Metro Extension is currently the highest contributor for disbursements under the Investment Program.

Anaklia Coastal improvement project

138. The Mission requested MDF to extend the contract subject to the contractor submitting a revised work plan with weekly outputs, resources plan, and proof of import of the new vessel. The submission should be reviewed and endorsed by the EPCM consultant. The Mission also noted that the EPCM consultant staff should be enhanced for better supervision of the project.

139. There are about 8000 units of 5 ton and 10 ton tetrapods (6,871 5-ton tetrapods and 1,056 10-ton) tetrapods remaining unutilized under both phases of Anaklia Coastal Protection Project. MRDI and MDF decided to explore opportunities for the future use of these tetrapods, either in Anaklia or on other site where coastal protection is needed. MDF started consultations within the government and relevant organizations to find the solution. Agreement was reached that one of the possible options might be to use them for another coastal protection project in the city of Poti. MDF submitted on 24 June 2016 a draft action plan for handover of the remaining tetrapods to Poti City Hall, which was discussed with the ADB Mission in August 2016.

140. MDF and MRDI indicated that the Poti Coastal Protection Project (design, laying out activities and supervision) would be financed under the World Bank's Second Regional and Municipal Infrastructure Development Project. To date, MDF and MRDI are still refining and finalizing the action plan with focus on: (i) location and plan for storage of tetrapods (including location [in Anaklia and/or Poti], and before/after handover to Poti City Hall); (ii) options for transportation of the remaining tetrapods (under the Anaklia Coastal Protection [Phase 1] contract, or under a new contract, and transportation by sea and/or by land); (iii) modality for the handover of tetrapods to Poti City Hall; and (iv) detailed and time-bound action plan with defined role of each party.

141. The Mission discussed these aspects with MDF and the EPCM consultant and provided guidance. Regarding transportation of the tetrapods, the Mission recommended using sea transportation over land transportation to minimize environmental impacts. More generally, all due diligences (including the revision and update of the current IEE) should be performed regarding transportation and storage of the tetrapods. MDF will build on, amend and expand as necessary the previous transportation action plan, and will submit the revised plan to ADB for review by mid-January 2017. Regarding storage, the Mission recommended for the tetrapods to be stored according to the stone yard guidelines of Sogrea (design of tetrapod) as indicated by the Engineer.

142. At this time, it is not clear whether storage will be set in Anaklia or in Poti. MDF agreed to develop a storage plan with the support of the Engineer, including storage in Anaklia until the tetrapods are moved to Poti. Proper storage will then need to be secured in Poti. It was also agreed that the existing storage location in Anaklia will be converted into a proper stone yard. The storage plan will be submitted to ADB for review by mid- February 2017, together with the transportation action plan. In its review process (including necessary internal consultations), ADB will focus on the handover modalities and compliance with the loan covenants.

Findings of ADB RETA Consultants during the Site-Visit conducted on 17 October, 2016

Tbilisi Metro extension project

143. On October 17, 2016 Regional Environmental Consultant of ADB under the RETA project - Keti Dgebuadze and RETA 8663 International Consultant - Jeffrey Bowyer , together with MDF's Local Environmental Consultant – Nino Nadashvili, conducted the site-visit at Tbilisi Metro Extension Project, met with Contractor (JV Cobra and Assignia/Spain) and Supervision consultant (Eurostudio S.L.) representatives and checked whether the implementation processes and activities corresponds the EMP/SSEMP requirements.

Findings were as follows:

A: Specific issues

144. The Commencement Date of works was established on June 20th 2015. At present, there are on-going activities covering: underground civil works (concreting activities of University Station Platform, crossover, Tunnel between Platform and Crossover, On PK 81+70 soil excavation in the main drainage pumping chamber for the water pump sump, Excavation for emergency exit, injection works in the station and left tunnel, etc).

145. Works are being performed according to the work schedule agreed with MDF. Up to date the total accumulated delay of work has been approximately quantified by 6.76 % of the total project, according to the last updated payment schedule.

146. All documents requested by the NES (IEE, EMP, SSEMP, monitoring reports, monitoring checklists, licenses, permits, complaints log book, as well as records of trainings) were kept on camp site.

147. Management Plans: Currently the following plans are prepared and submitted to PIU/MDF: Emergency Response Plan; Health and Safety Management Plan and SSEMP. According to new Waste Management Code of Georgia (January 2015) contractor has prepared Inventory List of Waste and submitted to MoENRP for approval. According to the same code CC should prepare Company Waste Management Plan and submit to MOENRP for approval till December 2016.

148. Construction Contractor: CC hired National Environmental and Health and Safety Manager (from June, 2015), who is permanently on the site and undertakes permanent monitoring using daily and weekly checklists. CC has also hired an International Environmental Expert who works one week per two months.

149. Supervision Consultant: According to the NES advice during the previous mission (October 2015), National Environmental Specialist (Sandro Abzianidze) was hired on a part time job by the SC on 16 January 2016. He prepares quarterly reports and submits to PIU.

150. Biodiversity: No trees have been cut since January 2016.

151. Waste Management: Non-hazardous waste, household and solid waste is disposed to official dump site in Gldani district municipality dump area by contractor JV Cobra Assignia and its sub-contractor - Prime concrete, based on the contract signed by all parties (contractor, sub-contractor and solid waste company). According to the contact signed on 09.11.2015 Solid Waste Company of Georgia is serving contactor in two points (shaft 51 and shaft 50) twice a week.

152. Hazardous waste (such as oil, solvents, materials used in oil spill cleanups and etc.) is collected and stored on separate place with appropriate covered skips. Periodically it is passed to a licensed operator Company “Sarini”, which has the permit on operation of the hazardous waste. Contract N 25022016 with Company “Sarini” was signed in February, 2016.

153. Hazardous waste (Asbestos): After negotiation of the Contractor with licensed company (Solid Waste Company Ltd) regarding to the final disposal of hazardous waste, approximately 22 m3 temporarily stockpiled asbestos at camp site was transported and properly disposed on the landfill in Marneuli in August 2016. The relevant acceptance act is kept at the contractor’s camp site.

154. GRM: Till present, there was one grievance delivered from local municipality on 26 April 2016 regarding the rodents’ dissemination from tunnel to nearby apartment buildings. To resolve this issue, Contractor Company ensured implementation of disinfection at the mentioned area through specialized sanitary company.

155. Emergency exit: Location of emergency exit has been changed and Detailed Design has been prepared and submitted to MDF for approval. International environmental specialist of SC has updated SSEMP in September 2016 due to changes in the detailed design.

156. Monitoring (noise, air, groundwater, dust): Based on the contract 3/60 (between Contractor and National Environmental Agency) contractor requested to take monthly measurements of air, water and noise in different points. According to the measurement data provided in September 2016 the obtained results did not exceed the National Environmental Standards (Decree No. 297/N "On Approval of Environmental Quality Norms" (August 16, 2001 of the Ministry of Labor, Health and Social Affairs). But, results obtained in July and August 2016 related to dust and accordingly air quality, shown some non-compliances, in particular: there was plenty of dust in the tunnel. According to corrective actions requested by the SC additional fan has been installed in the tunnel in order to improve the ventilation system there. Operation of all ventilators is mandatory every time construction works are being carried out; PPE equipment (air mask, eye goggles) should be used by all workers and it is mandatory to use them. It should be noted that from September 2016 till present due to mitigation measures applied by CC the situation has been improved and dust was not observed in the tunnel.

157. Groundwater: The contractor conducts the underground water chemical and microbiological tests periodically and monitors groundwater inflow if it is necessary. No underground water quality tests have been taken out during Jan-Jul 2016 period as there was no need for it. The next tests for underground water quality will be done in November 2016 by the National Environmental Agency and results will be reflected in Jul-Dec 2016 BAEMR.

158. Vibration: According to IEE there is no requirement to perform vibration measurements.

B. Agreed Actions/Recommendations

159. According to the new Waste management Code of Georgia CC should prepare Company Waste Management Plan and submit to MOENRP for approval till December 2016.
Current Status: Contractor has prepared and submitted draft of Company Waste Management Plan to the MOENRP for approval on December 21, 2016. Letter of submission is attached to this document (see attachment: 5).

160. Results of groundwater and air quality measurements to be reflected in next July-December 2016 BAEMR.
Current Status: Results of groundwater and noise and atmospheric air chemical parameters measurements are attached to the document (see attachments: 1 and 2).

3.5. Consultation and Complaints

Grievance Redress Mechanism

161. During the projects implementation several issues, related to the environmental and socials safeguards and disputes on entitlement processes', might be occur due to the Projects activities. For

example, intensive schedule of construction activities, inappropriate timing of construction vehicle flow, waste, noise and air pollution from construction activities, ecological disturbances, cultural conflicts between migrant workers, are some of the environmental and social safeguard issues that are likely to be raised from the Project activities.

162. In order to provide a direct channel to the affected persons for approaching project authorities and have their grievance recorded and redressed in an appropriate time frame, Grievance Redress Mechanism was established with efforts of MDF within the projects.

163. Complaints' registration journal is created and available at construction sites. The copy of journal with mobile numbers of relevant persons is placed at local Municipality as well. Complaints' from the people, regarding the environmental safeguard issues in case of their disturbance and inconvenience, because of improper or inadequate implementation of EMP, can be accepted in both places. Complaints' will be registered in database system, assigning compliant number with date of receipt. Complaints' will be investigated and complainant will be informed about time frame in which the corrective action will be undertaken, in case if the raised problem is realistic.

164. MDF, as EA, facilitates the grievance resolution by implementing a project-specific Grievance Redress Process (GRP). It will deliver grievances to relevant authorities, in case if such grievances are sent to MDF. The official administrative bodies are obliged to respond to the grievances that have been received from population or other interested parties in accordance with the requirements of the Administrative Code of Georgia.

165. According to the existing legal and administrative system in Georgia, there are several entities responsible for addressing environmental complaints of population and interested parties. The administrative bodies directly responsible for environmental protection within the projects area are: MoE, municipal offices (gamgeoba) and Tbilisi City Hall. The affected population and stakeholders may send their grievances, related to the project-induced environmental impacts directly to the mentioned administrative bodies responsible for environmental protection.

166. During the reporting period none of complaints have been raised and registered under the projects.

4. PART IV – ACTION PLAN FOR THE NEXT PERIOD

167. The monitoring of Environmental performance is being carried out by Contractor's and Supervising Company's environmental specialists systematically. During the next reporting period contractors will carry out new necessary tests. Also new monthly and quarterly reports will be prepared and submitted to the MDF.

Anaklia Coastal improvement Project

168. Construction contract is expired on June 30, 2016. Further actions should be considered and agreed with ADB.

169. During the ADB mission conducted within 3-11 May, 2016 MDF was advised to prepare a plan for the storage and use of the tetrapods which were left unused under both projects (Phase 1 and 2). The tetrapods will need to be stored according to the stone yard guidelines of Sogrea (design of tetrapod) as indicated by the Engineer. Various options were discussed and MDF agreed to provide a short to medium term storage plan, till the re-use option is decided. It was agreed that the existing location be converted into a proper stone yard, as the tetrapods should only be moved once, when they are to be installed at their new location, this would have minimum environmental and safety risks.

170. The draft of mentioned plan for storage of tetrapods was prepared by the Engineer in the end of June and submitted to the MDF for consideration. Mentioned plan was sent to ADB as well.

171. To date, as it was mentioned above, MDF and MRDI are still refining and finalizing the action plan with focus on: (i) location and plan for storage of tetrapods (including location [in Anaklia and/or Poti], and before/after handover to Poti City Hall); (ii) options for transportation of the remaining tetrapods (under the Anaklia Coastal Protection [Phase 1] contract, or under a new contract, and transportation by sea and/or by land); (iii) modality for the handover of tetrapods to Poti City Hall; and (iv) detailed and time-bound action plan with defined role of each party.

172. MDF will build on, amend and expand as necessary the previous transportation action plan, and will submit the revised plan to ADB for review by mid-January 2017. Regarding storage, the Mission recommended for the tetrapods to be stored according to the stone yard guidelines of Sogrea (design of tetrapod) as indicated by the Engineer.

173. The storage plan will be submitted to ADB for review by mid- February 2017, together with the transportation action plan.

Annexes

Annex 1: Monitoring Data

Tbilisi Metro Extension project

Object of monitoring	Control/Sampling Point	Technique	Frequency/time	Target	Entity responsible for Monitorin
Air pollution inside the tunnel/ underground shafts	- Metro extension tunnel - University station shaft - New tunnel section for -cross over and parking of tracks.	- Visual control - Atmospheric air test (all set general parameters) - Monitoring air-flows for explosive gases and specific atmosphere contaminants -Inspection mechanical ventilation system - Inspection moving and diesel machines & vehicles	- Daily - Baseline and weekly sampling/test - Monthly sampling and testing (specific parameters); - Technical check-up of HVAC equipment - During the transportation operations - During installation and commissioning services for all plants operations	-Ensuring compliance with the established quality norms of ambient air quality; - Minimizing the impact on health for workers operating inside tunnel, stations/shafts - Ensuring the personnel's safety (visitors, machine operators, etc.)	JV "COBRA" and "ASSIGNIA"

		- Technical check-up of permanent plants installed (facilities)	- During installation and commissioning services for all plants		
Air pollution outside the tunnel/ underground shafts	- Delisi Station - University Station - Open sites around new tunnel section for cross over and parking tracks (nearest receptor = Residential houses).	- Visual control - Atmospheric air test (baseline and quarterly basis of general parameters) - Inspection moving and diesel machines/vehicles - Checking for water spraying inside and around (access road) the construction sites (especially at dry season)	- Daily - Baseline and weekly sampling/test - Daily - Daily - Daily - Daily - Daily	- Ensuring compliance with the established quality norms of ambient air quality; - Minimizing the impact on health for residents, commuters and students living around project sites	JV “COBRA” and “ASSIGNIA”

		- Checking for materials transported to site to be covered/ wetted down to reduce dust - Verification of register and permits for all vehicles and plant equipment - Verification on burning sites for wastes generated at the construction sites		- Ensuring the health and safety of personnel operating outside the sites	
Fire prevention	- Metro extension tunnel - University station shaft - New tunnel section for cross over and parking tracks. - Open sites around above sites. - The nearest receptor (residential houses) - Metro extension tunnel - University station shaft	- Visual control - Measuring atmospheric conditions - Firefighting training and procedures incl. emergencies - Technical check-up of firefighting devices - Checking for restriction signals for smoking in all working areas - Checking brake drag	- Daily - Monthly - During pre-construction - Daily (weekly) - Daily (sanctions against smokers at work place to be taken immediately) - Weekly - Weekly - Weekly	-Ensuring compliance with the established quality norms for fire prevention; - Ensuring the health and safety of all personnel and residents in case of fire	JV “COBRA” and “ASSIGNIA”

Surface and underground fueling	- New tunnel section For cross over and parking tracks. - Open sites around above sites	and brake temperature indicators (all machines & moving vehicles) - Checking engine fire walls on loaders - Checking quality of insulating of high current electrical systems (inside tunnel/shafts -Visual control of all fuel storage areas - Developing fuel procedures incl. if necessary fuel underground storage - Designating fueling bays - Technical check-up of fire extinguishers near bays	- Daily - During pre-construction - During pre-construction - Weekly	-Ensuring compliance with the established quality norms for fire prevention; - Ensuring the health and safety of all personnel involved with refueling of plants and vehicles using inside or outside the station shafts and tunnel	JV “COBRA” and “ASSIGNIA”

Erection of plants / installation services inside the stations and tunnels	- Delisi Station - University Station - Open sites around new tunnel section for cross over and parking tracks (nearest receptor residential houses	- Visual control and daily inspection of the works - Inspection of plants in factory and at arrival to site(e.g. plant with automatic cut-off in flammable atmospheres) - Checking if plants at commissioning at operating in safe working environment - Checking of plant levels of emissions e.g. exhaust, noise, vibration and heat (at commissioning) - Verification that plants complies with electrical standards/regulations	- Daily - Factory inspection and inspection at arrival - Commissioning test - Commissioning test - Commissioning test - Commissioning test	Ensuring compliance with standards and regulations of plant operations upon commissioning (electrical compliance, exhaust, noise, vibration, etc.) - Ensuring safety during installation and after commissioning, ensuring all plants operate in safety mode and prevent any incident leading to environmental problems (e.g. oil spell, fire, etc.)	JV “COBRA” and “ASSIGNIA”
Vibration and noise	Metro extension tunnel - University station shaft - New tunnel section for cross over and parking tracks. - Open sites around above sites - The nearest receptor (residential houses	- Noise level measurement at all designated sites - Visual control and inspection of the works (all sites) - Inspection of vibration emission data of tools in use - Inspection of moving machines and vehicles (silencing engines) - Inspection of plants in factory and at arrival to site (e.g. noise insulation of plants)Checking of plant levels of emissions for noise /vibration at commissioning	Monthly - Regular control (particularly during much “noisy” operations) - Inspection at arrival of tools and machineries - Daily - Factory inspection and inspection at arrival - At commissioning of plants - Daily (sanctions against staff not using hearing protection	- Ensuring compliance with health and safety norms - Minimizing the population disturbance; - Ensuring comfortable working conditions for the workforce operating inside underground tunnel and shafts	JV “COBRA” and “ASSIGNIA”

		test) - Checking all workers operating in tunnel/shafts are using hearing protection			
Soil, Flora/fauna, soil/water pollution and construction waste management	- University station construction site - New tunnel section parking tracks site - The nearest receptor (residential houses)	Monitoring of tree cutting and site clearance/top soil - Atmospheric air test for parameters related to biodiversity protection, to verify level of dusts and emissions near parks - Soil and sediment sampling and test Check dewatering system in use (shit piling etc.) - Check hazardous waste storage locations - Checking cleaning of construction area	- During the stripping and storage of the topsoil and during tree cutting' - Baseline and quarterly basis for atmospheric air test - As required, in case of soil and sediment contamination - During dewatering operations - Weekly - Daily	Ensure biodiversity protection at all time - Ensure no surplus/waste soil is accumulated at the site - Avoid soil contamination - Ensure storage of waste including hazardous waste at chosen premises complies with law and good practice; - No storage of fuel, oil or toxic materials at construction sites especially underground	JV "COBRA" and "ASSIGNIA"

Building stability Impacts caused by excavation. Damage to community facilities; Traffic congestion, Protection of cultural heritage; Historical and archeological chance finds during excavation	- Metro extension tunnel - University station shaft - New tunnel section for cross over and parking tracks. -Open sites around above sites. -The nearest receptor (residential houses)	-Monitoring of settlements and damages (geotechnical and structural damage assessment of buildings or project facilities) - Inspection of all buildings around construction sites - Inspection of access roads - Inspection of utilities along access roads and near construction sites - Inspection of eventual damages caused to utilities and estimate of costs and scope for repair works - Check signs are install to control traffic to avoid traffic congestion at streets or near sites affected by the works - Check adequate lightening is provided at all sites and at road diversions - Updating traffic management plan as works progresses - Verify protocol for conducting excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved.	- Weekly - Weekly - Daily - Weekly - Visual inspection upon damages - Daily - Daily - As required -During pre-construction	- Ensure biodiversity protection at all time - Avoid damages to public and private existing buildings and properties - Avoid settlement and damages to new project buildings - Avoid damages to public utilities in access roads or near project facilities - Smooth traffic operations long public roads and access roads to sites	JV “COBRA” and “ASSIGNIA”

Anaklia coastal improvement project

Object of Monitoring	Control/Sampling Point	Technique	Frequency/Time	Target	Entity responsible for Monitoring
1	2	3	4	5	6
Atmospheric air	Business yard, Construction sites	• Visual control • Technical check-up of machinery • Laboratory Checks every tree month.	The monitoring of the Atmospheric Air quality is been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist. During the transportation operations, in dry weather on a periodic basis, technical check-up of machinery before works, during the installation of underwater breakwater. Laboratory test are taken in every three month. Tests were taken on 4.02.2016. During this period no problems has been detected.	• Ensuring compliance with the established quality norms of ambient air quality; • Minimizing the impact on the population health; • Ensuring the personnel's safety.	Construction Contractor
Noise	Business yard Construction sites The nearest receptor (residential houses)	• Control; • Measuring;	Monitoring of the construction process noise level has been carried out by contractor environmental specialist on daily bases and by supervising environmental specialist. Regular control(particularly during with noisy operations); Measuring (In case of grievance); Technical check-up of machinery before works. The nearest receptor	• Ensuring compliance with health and safety norms; • Minimizing the population disturbance; • Ensuring comfortable working conditions for the workforce.	Construction Contractor

		• Technical check-up of machinery.	(residential houses) is approximately 400-500m away from construction site, drivers are maintaining the safe speed limits 30 km/h on main roads and 10 km/h on construction site, there for no noise complains has been detected. During this period no grievance or problems have been detected.		
Soil	Construction camp - Material and waste storage areas;Construction sites	• Visual control • Supervision over the waste management; • laboratory control over the soil quality; • Technical check-up of machinery.	Monitoring of the construction process soil mitigation level has been carried out by contractor environmental specialist on daily basis and by supervising environmental specialist. Laboratory control – as necessary (in case of oil spills). Material and waste storage areas are indicated and isolated. During this period no problems has been detected. Regular check-up; Inspection after completion of works;	• Preserving the soil stability and quality; • Minimizing the impact on other receptors depending on the soil quality (vegetation cover, holiday-makers, etc.).	Construction Contractor
Increased seawater turbidity	Sites in the sea where the sand removed during the seabed treatment and from the seabed is to be placed.	• Visual control; • Turbidity analysis	Monitoring of the Increased seawater turbidity level is been carried out by contractor environmental specialist on daily basis and by supervising environmental specialist. Permanent visual control; Identifying the degree of turbidity through analysis (in every 4 hrs. During the work). Upon intensive commencement of works in the sea,	• Maintaining ichthyofauna and microphytes.	Construction Contractor

			water testing has been conducted together with turbidity control, which should be constantly ongoing.		
Underground water	Construction camp - Material and waste storage areas;Construction sites Gas station	• Visual controlof soil quality; • Laboratory controlof soil quality (in case of spills); • Technical check-up of machinery.	Monitoring of the underground water mitigation level has been carried out by contractor environmental specialist on daily bases basis and by supervising environmental specialist.Regular check-up; Laboratory control as necessary (in case of oil spills). Material and waste storage, Gas station areas are indicated and isolated. During this period no problems or oil spills has been detected	• Guaranteed protection of the underground water quality	Construction Contractor
Surface water: the Black Sea, the rivers Kitori and Enguri	Construction ground Business yard	• Visual control; • Supervision over the waste management and sanitary conditions. • Surface water laboratory control.	Monitoring of the Surface water mitigation level is been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist Regular check-up and inspection; Laboratory control – as necessary (in case of oil spills). Sea water Laboratory test are taken in every three month. Tests were taken on 15.07.2015.During this period no problems has been detected	• Protecting the water quality in the river; • Reducing the impact on the receptors (water biodiversity, etc.) depending on the river water quality.	Construction Contractor

Negative visual impact	Construction camp - Material and wastestorage areas;Construction sites	• Visual control; Supervision over the waste management and sanitary conditions.	Monitoring of the negative visual impact has been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist Regular check-up and inspection; After completion of works. During this period no problems has been detected	• No dissatisfied population; • No dissatisfied pedestrians.	Construction Contractor
Waste	Business yard and/or adjacent area;	• Visual control of the area;] • Control over the waste management.	Monitoring of waste management issues is been carried out by contractor environmental specialist on daily bases and by supervising environmental specialist. Regular check-up and inspection; After completion of works. Construction waste is accumulated on construction site in special isolated areas divided by hazardous, domestic and construction waste. Construction company has signed contract with the companies for waste removal. Waste has been removed from construction site buy authorized personal only in accordance of safety regulations. The waste is removed from construction site by authorized personal only in accordance of safety regulations.	• Protection of soil and water quality; • Reduce the risk of negative visual impact; • No dissatisfied population.	Construction Contractor
Labor safety	Working ground	• Inspection;	Monitoring of the labor safety issues has been carried out by contractor	• Ensuring compliance with health and safety norms;	Construction Contractor

		• Availability of personal protection equipment and periodic control over their good maintenance; • Control over the meeting the requirements for labor safety.	environmental specialist on daily based and by supervising environmental specialist. Before the works;Periodic control during the works.Some of the labors don't have PPE equipment problem detected by supervising environment specialist and corrected	• Avoiding/minimizing traumatism.	

Annex 2: Implementation report on the environmental impact assessment (EIA)/initial environmental examination (IEE)/Site Specific Environmental Management Plan (SEMP) mitigation requirements

Anaklia Coastal improvement Project

Reference	Requirement	Action to date	Action required/comment
Sea water pollution	The construction activities must be accomplished only in dry weather to avoid the pollution of the water currents; The construction activities must be accomplished by observing relevant safety measures; the materials and waste must not be in uncontrolled way over the site, etc. Locating the construction machinery and other equipment at a distance of at least 50 m from surface water bodies (where possible. If this seems impossible, taking permanent control and safety measures to avoid water pollution); Prohibition of washing of vehicles and other machinery near surface water bodies - The vehicles and equipment are recommended to wash by using commercial washing services; Limiting fueling and/or maintaining the vehicles/equipment to the	All works has been accomplished only in dry weather working conditions. All construction materials and machinery has been located 50 M away from surface of the water. All equipment and machinery has been maintained in good working conditions. The construction waste has been accumulated in special designated areas away from the water bodies and removed buy authorized personal only. On site environment specialists are maintaining visual monitoring for oils spills and equipment conditions, no accidents has been detected. Working Personal is being	Monitoring of the Surface water mitigation level is been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist Regular check-up and inspection; Laboratory control – as necessary (in case of oil spills). During reporting period no problems has been detected

	specially designated places only; The equipment and vehicles should be maintained in good working order to avoid the risk of spills of fuel/lubricants; Expedient materials and waste management; The waste generated during the works will be collected and temporarily stored at the specially designated places, distanced from the water bodies; In case of fuel/oil spills, locating and spilt material and cleaning the polluted area immediately to avoid long soil pollution; Installing drainage systems around the areas with the potential pollutants of surface flows (e.g. along the perimeter of groudn or construction materials storage areas); Instructing the personnel on the environmental and safety issues.	instructed on environment and safety issues rules and regulations.	
Pollution of underground waters	Control for the Pollution of underground waters must be maintained in the areas like: Construction camp - Material and waste storage areas;Construction sites,Gas station.	All works has been accomplished only in dry weather working conditions. All construction materials and machinery has been located 50 M	Monitoring of the Surface water mitigation level is been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist Regular check-up and inspection;

	Taking all measures to avoid the deterioration of the seawater quality.	away from surface of the water. All equipment and machinery has been maintained in good working conditions. The construction waste has been accumulated in special areas away from the water bodies and removed buy authorized personal only. On site environment specialists are maintaining visual monitoring for oils spills and equipment conditions, no accidents has been detected. Personal is being instructed on environment and safety issues rules and regulations.	Laboratory control – as necessary (in case of oil spills). During this period noproblems has been detected
Noise	The equipment and vehicles should be maintained in good working order; Driving the vehicles at optimal speeds; Instructing the personnel (particularly, the drivers of vehicles and techniques); Registering and responding to grievances (if any); Driving the vehicles along optimal routes and at optimal speeds; Switching off the vehicle drives or running at minimal speed when the	On site Environmental specialists are conducting visual control (on regular basis) of soil quality, laboratory controlof soil quality (in case of spills) no oil spills has been detected, technical check-up of machinery.	Regular monitoring has been carried out to provide guaranteed protection of the underground water quality.

	vehicles are not used; Carry out noisy operations during day time; Reaching preliminary agreement with the population living near the road about particularly noisy works.		
Dust	Watering of the non-asphalted ground or bare ground surfaces once in four hours on working days and in dry or windy weather; Observing the rules for storing the fill construction material to avoid their dusting in windy weather; Covering the lorries with tarpaulin when transporting loose materials, when there is probability of dusting; Taking necessary precautions (e.g. avoiding throwing the materials from heights when unloading them) to avoid excess dust emission during the earthworks and loading and unloading the materials; Driving the vehicles at optimal speeds; Washing the vehicle tires (recommended to use commercial services for this purpose); Instructing the personnel	All vehicles are maintained in good working conditions. Drivers are instructed to follow the limitations of driving speed (On construction site 10 km/h, 30 km/h on main roads). All noisy operations have been carried out during day time. No grievance has been detected concerning noisy works.	Monitoring of the construction process noise level has been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist. Regular control(particularly during much “noisy” operations); Measuring (In case of grievance); During this period no grievance or problems has been detected. Technical check-up of machinery before works. The nearest receptor (residential houses) is approximately 400-500 m away from construction site, drivers are maintaining the safe speed limits 30 km/h on main roads and 10 km/h on construction site, there for no noise complains has been detected.

	(particularly, the drivers of vehicles and techniques); Registering and responding to grievances (if any); Driving the vehicles along optimal routes and at optimal speeds; Switching off the vehicle drives or running at minimal speed when the vehicles are not used.		
Waste	Visual control of the area; Control over the waste management. Protecting soil and water quality; Reducing the risk of negative visual impact; No dissatisfied population.	Monitoring of waste management issues is being carried out by contractor environmental specialist on every day basis and by supervising environmental specialist. Regular check-up and inspection; Construction waste is accumulated on construction site in special isolated areas divided by hazardous, domestic and construction waste. Construction company has signed contract with the companies for waste removal. The waste is being removed from construction site buy authorized personal only in accordance of safety regulations.	
Vibration	The equipment and vehicles should be maintained in good working order;	Watering of the roads has been carried out by the contractor on every day basis. All lorries have	Monitoring of the construction process soil mitigation level (including dusting problems) is been carried out by

	Driving the vehicles at optimal speeds, particularly in the settled areas; Instructing the personnel (particularly, the drivers of vehicles and techniques); Registering and responding to grievances (if any); Driving the vehicles along optimal routes and at optimal speeds; Switching off the vehicle drives or running at minimal speed when the vehicles are not used; Carry out noisy operations during day time;	been covered buy tarpaulin to avoid dusting. Drivers are instructed to follow the limitations of driving speed (On construction site 10 km/h, 30 km/h on main roads). No grievance has been detected.	contractor environmental specialist on every day basis and by supervising environmental specialist. Regular check-up; Inspection after completion of works; Laboratory control – as necessary (in case of oil spills). Material and waste storage areas are indicated and isolated. During this period no problems has been detected.
Air Pollution of emissions	The equipment and vehicles should be maintained in good working order; Driving the vehicles along optimal routes and at optimal speeds; Switching off the vehicle drives or running at minimal speed when the vehicles are not used. Instructing the personnel before the start-up of the works.	All vehicles are maintained in good working conditions. Drivers are instructed to follow the limitations of driving speed (On construction site 10 km/h, 30 km/h on main roads). All noisy operations have been carried out during day time. No grievance has been detected concerning vibration.	Monitoring of the construction process noise level is been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist. Regular control(particularly during much “noisy” operations); Measuring (In case of grievance); During this period no grievance or problems has been detected. Technical check-up of machinery before works. The nearest receptor (residential

			houses) is approximately 400-500 m away from construction site, drivers are maintaining the safe speed limits 30 kph on main roads and 10 km/h on construction site, there for no noise complains has been detected.
Disturbance of the seawater during installation of tetrapods	During the works to level the seabed, permanent seawater analyses are needed to identify the degree of the water turbidity; If the degree of the water turbidity is in excess of the admissible limit (25 gr/l), the works must be stopped and relevant corrective measures must be taken.	Monitoring of the Increased seawater turbidity level is been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist. Permanent visual control; Identifying the degree of turbidity through analysis (in every 4 hrs. During the work). Upon intensive commencement of works in the sea, water testing has been conducted together with turbidity control, no problems has been detected.	During installation of TTP units environmental specialists are conducting visual control, taking turbidity analysis. No increased seawater turbidity has been detected.

Labor safety	Site -Inspections; Availability of personal protection equipment and periodic control over their good maintenance; Control over the meeting the requirements for labor safety. Ensuring compliance with health and safety norms; Avoiding/minimizing traumatism.	Monitoring of the labor safety issuesis being carried out by contractor's environmental specialist on every day basis and by supervising environmental specialist. Before the works; Periodic control during the works. Some of the labors don't have PPE equipment.	

Tbilisi metro extension project

Reference	Requirement	Action to date	Frequency	Action required/comment
Air quality impacts due to gaseous and dust emissions	a) Use only vehicles and equipment that are registered and have necessary permits. b) Burning of wastes generated at the construction sites, work camps and other project-related activities shall be strictly prohibited. c)Construction equipment and vehicles shall be well-maintained so that their noise and emissions do not cause nuisance to workers or local people. d) All vehicles will be checked and repaired in case of need to eliminate increased emission due to damaged parts. e) Protective equipment will be provided to workers as necessary. f) Keep stockpiles moist and cover vehicles with tarpaulin sheets or other suitable materials to minimize dust emission and prevent spillage of materials (e.g., soil, cement, stone, sand, aggregates, etc.). g) Provide temporary covers (e.g., tarpaulins, grass, etc.) on long term materials stockpiles.	Visual controlling is being performed used a ventilation system which is: monitored and upgraded to ensure air flows are always provided to the workplace, monitoring air flows for explosive gases and atmosphere contaminants regularly, Materials transported to site covered/ wetted down to reduce dust.	Daily Daily Daily Daily	Monthly progress report

	h) Provide truck-washing facilities to prevent truck-out of mud and dust onto city streets. i) All construction equipment and machinery shall be fitted with emission control equipment in full compliance with the national regulations. j) Ensure water spreading to suppress dust particularly during dry and windy weather. k) Impose speed limits on construction vehicles to minimize road dust.	Monitoring by Georgia National Environmental Agency include on a quarterly basis air testing at each underground site or confined space		
Noise and vibration impacts due to operation of construction equipment/ vehicles and various construction activities	To control noise impacts the following mitigation actions are recommended: a) Truck drivers and equipment operators shall minimize the use of horns. b) Position any stationary equipment that produce high noise levels as far as is practical from sensitive receptors; c) All construction equipment and vehicles shall be well maintained, regularly inspected for noise emissions, and shall be fitted with appropriate noise suppression equipment consistent with applicable national and local regulations. d) Use only vehicles and equipment that are registered and have necessary permits. e) No noisy construction-related activities will be carried out during the	Noise level measurement at all sites, Visual control and inspection (all sites), used hearing protection (inside tunnels and shafts), silenced engines to achieve a noise level not exceeding LAeq 85 dbA, Monitoring by Georgia National Environmental Agency include on a quarterly basis Noise testing.	Monthly Daily Daily	Contractor will take 7 points until the end of the project as per BoQ

	night. f) Impose speed limits on construction vehicles to minimize noise emission			
Spoils generation from excavation works (5.247,99 m3) at underground station sites	Contractor will submit a spoil disposal plan (as a part of the SEMP) to the MDF and MoEP for approval. The spoil plan should show the location of proposed sites (landfill or borrow pits) to be used and the measures to be taken to rehabilitate these pits upon finalization of the Project. The capacity of disposal sites shall be adequate to accept the quantity of spoils without alienating areas outside the site boundaries. Trucks transporting spoils shall be tightly covered with tarpaulin or other suitable materials to minimize dust emission and spills.	Contractor submitted the transfer notes that spoil amount 630m3 was transported and disposed by "prime Concrete" to Tbilisi Gldani district landfill		Updated Spoil disposal plan was submitted
Generation of solid wastes (construction waste and domestic waste), including 4,250.00 m3 of different types of materials will be generated as a	Regarding the generation of solid waste, the waste procedures included in SEMP prepared by the contractor should contain, at least, the following mitigation actions: a) Provide garbage bins and facilities within the project site for temporary storage of construction waste and domestic solid waste. b) Separate solid waste into hazardous, non-hazardous and reusable waste streams and store temporarily on site in secure facilities with weatherproof flooring, security fencing and access control and drainage/wastewater collection systems.	Contractor provided several waste bins and containers on the office and shafts 51,50 territories as well non-hazardous, hazardous and solid wastes are separated.	Daily checking of segregation	Contractor submitted Waste Management Plan. Submittal N S 044

result of the demolition activities	c) Ensure that wastes are not haphazardly dumped within the project site and adjacent areas d) Undertake regular collection and disposal of wastes to sites approved by local authorities or contract municipal waste operators for disposing household waste, garbage and small amounts of nonhazardous construction waste etc..			
Generation of hazardous waste	Constructing Contractor shall collect all hazardous waste residuals, such as oil, solvent, material used in oil spill cleanups… and store them within appropriate covered skips, and pass it to a licensed operator, having environmental permit on operation of the hazardous wastes. Regarding the generation of hazardous waste, the waste management procedures included in SEMP prepared by the Contractor should contain, at least, the following mitigation actions: a) Store fuel and hazardous substances in paved areas. If spills or leaks do occur, undertake immediate clean up. b) Ensure availability of spill clean-up materials (e.g., absorbent pads, etc.) specifically designed for petroleum products and other hazardous substances where such materials are being stored. c) Train relevant construction personnel in handling of fuels and spill control procedures.	All personnel was trained and instructed in waste management practices and procedures as a component of the environmental induction process, maintained all construction sites in a cleaner, tidy and safe condition, Separated hazardous wastes and stored temporarily on site in secure facilities with weather proof flooring, security fencing.	Before stating the construction works Daily	

	d) Ensure all storage containers are in good condition with proper labeling. e) Regularly check containers for leakage and undertake necessary repair or replacement f) Store waste oil, used lubricant and other hazardous wastes in tightly sealed containers to avoid contamination of soil and water resources. g) Transport and off-site disposal of such wastes shall be consistent with national and local regulations	Proper labeling is provided.	Daily	
Topsoil losses due to improper storage and handling	Top soil protection: The storage of topsoil in stockpiles, no more than 2 m high with side slopes at a maximum angle of 45º. Dedicate storage locations that prevent the stockpiles being compacted by vehicle movements or contaminated by other materials. Top soil collection: 100 m3 x 3.98 €/m3 = 398 € Reinstatement of Topsoil Topsoil removed from University station will be used for reinstatement of the topsoil in adjacent zones affected by the project activities or other zones designed by the municipality. Top soil replacement: 100 m3 x 1.40 €/m3 = 140 €	N/A	N/A	There is no need to take these measures, because the top soil had been taken in previous work stages.

Trees that are directly (need to be cut) or indirectly (need to be protected) affected by the project	As a result of construction activities, 21 trees along the project area will be destroyed and 46 will need protection. Compensatory planting of the species should be facilitated with a proportion bigger than 1:3, so that 63 trees will be planted. - Removal of trees: 3.751,80 GEL - Ripping and scarifying: 218,50 GEL - Hidroseeding: 851,00 GEL - Tree planting, including stakes: 4.444,09 GEL - Protection of trees: 741,24 GEL	Cutting of trees and site clearance was monitored		The trees that are not going to be cut should be protected
Traffic congestion and access problems	To avoid traffic congestion and access problems the following mitigation actions are recommended: a) Provide signs advising road users that construction is in progress b) Employ flag persons to control traffic at the station sites for safety reasons when construction equipment is entering or leaving the work area. c) Provide sufficient lighting at night within and in the vicinity of construction sites. d) As much as possible, schedule delivery of construction materials and	Checked signs which are installed to control traffic to avoid traffic congestion at streets or near sites, Checked adequate lightening is provided at all sites and at road diversions.	Daily Daily	

	equipment as well as transport of spoils during non-peak hours. e) Avoid movements of noisy vehicles during night time in vicinity of sensitive receivers. f) Implement suitable safety measures to minimize risk of adverse interactions between construction works and traffic flows through provision of temporary signals or flag controls, adequate lighting, fencing, signage and road diversions.			
Hazards to health and safety of workers and the public due to construction works	Training in special skills, environment, emergency and safety regulation will be provided for workers before hiring, especially for those that will work underground. The underground section construction process needs to be supervised and monitored much more carefully in order to be able to detect the early sign of subsidence. To avoid this impact the following mitigation actions are recommended: a) Provide first aid facilities that are readily accessible by workers. b) Provide firefighting equipment at the work areas, as appropriate, and at construction camps. c) Provide separate hygienic sanitation facilities/toilets for male and female workers d) Ensure proper collection and disposal of solid wastes within the	Contractor provided the first aid facilities and fire fighting equipment at the work areas, Contractor provided separate hygienic sanitation facilities/toilets for male and female workers on the camp.	Daily Daily	Manpower are trained on daily bases, tool box talks are filled accordingly

	construction camps consistent with local regulations. e) Provide appropriate personnel safety equipment such as safety boots, helmets, gloves, protective clothes, breathing mask, goggles, and ear protection f) Ensure reversing signals are installed on all construction vehicles. g) Implement precautions to ensure that objects (e.g., equipment, tool, debris, etc.) do not fall onto or hit construction workers. h) Implement fall prevention and protection measures whenever a worker is exposed to the hazard of falling more than two meters, falling into operating machinery or through an opening in a work surface, etc. i) People from outside will be restricted from entering the construction sites in order to avoid accidents. j) Construction sites shall be cleaned regularly and provided with adequate sanitary equipment in order to reduce risk of spreading diseases.	Contractor provided appropriate personnel safety equipment safety boots, helmets, gloves, protective clothes, breathing mask, goggles, and ear protection. The reversing signals are installed on all construction vehicles. Construction sites is being cleaned regularly. People from outside are restricted from entering the construction sites in order to avoid accidents.	Daily Daily Daily Daily	
Cultural and archaeological sites protection;	Construction Contractor should engage an archaeologist (archaeological supervisor) for conducting daily supervision activities during excavation activities. Permanent monitoring by the archaeologist during excavation activities. Chance Finds Procedure included in section 5.2.11 of the IEE should be	Verified protocol for conducted excavation work, to ensure that any chance finds were recognized and measures were taken to ensure they are protected and conserved.	During pre-construction	N/A

	implemented, including: stoppage and suspension of construction activities in case of archaeological findings; Completion of required archaeological works before restarting construction activities; Conservation of remnants.			

Annex 3: Photos

Anaklia Coastal improvement project

Photo 1: Specific waste disposal inside the tunnels. Plastic wood and debris are being conveniently separated in this point

Photo 2: Waste disposal inside the tunnels. Adequate Wood separation and compilation

Photo 3: **General Waste disposal inside the tunnel. The non-compliance has not been close**

Photo: 4 Taking the ground water tests

Attachment 1: Measurements of noise and atmospheric air chemical parameters

1.1. Measurements of Environmental Agency conducted on 7/07/2016 and 24/08/2016

Tbilisi, Vaja-Pshavela Ave, Coordinates : T0476525; 4619028, 07.07.2016, 16^{00}-17^{00}

Site	Dust	CO	NO_2	SO_2	TPH	H_2S	Noise Level, dB
	mg/m³						
Ground	0,21	0,27	0,54	<0,265	-	-	70
Underground	3,23	7,52	0,913	<0,265	6	<0,141	77,6
MPC	2,0	20,0	5,0	10	-	10	80

0,265 mg/m³ and 0,141 mg/m³ – sensitivities of SO_2 – and H_2S – measuring devices, correspondingly.

Measurements were carried out with following devices – Элан CO-50 / NO_2 (CO, NO_2), Gas Alert Micro 5 (SO_2, H_2S), CEL-712 (Dust), КОЛИОН-1В (TPH), SLM-700 (Noise).

Tbilisi, Vaja-Pshavela Ave., Coordinates: 38T0476525; 4619028, 24.08.2016, 11^{00}-12^{00}

Site	Dust, mg/m³	CO, mg/m³	NO_2, mg/m³	SO_2, mg/m³	TPH, mg/m³	H_2S, mg/m³	Noise Level, dB
Place of works	0,888	3,97	0,029	<0,265	2	<0,141	78,1
Impasse	0,637	3,42	0,019	<0,265	1	<0,141	71,9
MPC	2,0	20,0	5,0	10	-	10	80

0,265 mg/m³ and 0,141 mg/m³ – sensitivities of SO_2 – and H_2S – measuring devices, correspondingly.

Measurements were carried out with following devices – Элан CO-50 / NO_2 (CO, NO_2), Gas Alert Micro 5 (SO_2, H_2S), CEL-712 (Dust), КОЛИОН-1В (TPH), SLM-700 (Noise).

1.2. Measurements implemented by the Contractor
1/07/2016

Date of Inspection: 01.07.2016	Project: Tbilisi Metro line 2	Location :Shaft 50/Platform

Introduction

Under the project Tbilisi Metro line – 2 Contractor cobra as gaio health, safety and environmental department conduct Atmospheric air samples for chemical analyse and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Giorgi Tchumbegashvili and Natia Kankuzaevi visited site in order to take measure Co, Co2 and Noise ; the sampling took place at 14:30 in all sections there the activities were in progress, particularly Cross over, Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below - figure 1.

Result

Location	Co	Co2	Noise level
	mg/m3	PPM	Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000 -2000	80
Platform	0.0	600	61.2
Crossover	0.0	900-910	60.8
Sub station	0.0	800 -810	70.8
Ventilation tunnel	0.5	980	70.5
Left tunnel	0.0	900	81.5
Dead ends	5.5	1130 - 1200	

1.3. Measurements implemented by Contractor 8/07/2016

Date of Inspection:	08.07.2016	Project: Tbilisi Metro line-2	Location :Shaft 50c Construction site

Introduction

Under the project Tbilisi Metro line – 2 Contractor cobra assignia health, safety and Environmental department conduct Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Levan Guarava , Valeri Sadunishvili and Natia Karkuzaeli visited site in order to take measure Co, Co2 and Noise ; The sampling took place at 14:30 in all sections there the activities were in progress, particularly Cross over, Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below figure 1.

Result

Location	Co mg/m4	Co2 PPM	Noise level Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000- 2000	80
Platform	0.0	810	81.4
Crossover	0.0	900- 910	78
Sub station	0.0	801- 810	79.8
Ventilation tunnel	0.5	930	79.5
Left tunnel	0.0	900	81.5
Dead ends	5.5	1130 - 1200	

1.4. Measurements implemented by Contractor
15/07/2016

Date of Inspection:	15.07.2016	Project: Tbilisi Metro line 2	Location :Shaft 9bt Construction site

Introduction

Under the project Tbilisi Metro line – 2 Contractor cobra assigns health, safety and environmental department conduct Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantity airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Valeri Sadunishvili and Natia Kerkuzashvi visited site in order to take measure Co, Co2 and Noise ; The sampling took place at 10:25 In all sections there the activities were in progress, particularly Cross over, Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below - figure 1.

Result

Location	Co mg/m3	Co2 PPM	Noise level Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000- 2000	80
Platform	0.0	550 -620	80.1
Crossover	0.0	900- 910	78
Substation	0.0	800 -810	79.8
Ventilation tunnel	0.5	930	79.5
left tunnel	0.0	900	81.5
Dead ends	5.5	1130 - 1200	

1.5. Measurements implemented by Contractor
5/08/2016

Date of Inspection: 05.08.2016	Project: Tbilisi Metro line-2	Location :Shaft 50c Construction site

Introduction

Under the project Tbilisi Metro line – 2 Contractor cobra avagumi health, safety and Environmental department conduct Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Valeri Sadunishvili and Natia Karkuzaevi visited site in order to take measure Co, Co2 and Noise ; The sampling took place at 16:40 In all sections there the activities were in progress, particularly Cross over, Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below - figure 1.

Result

Location	Co mg/m3	Co2 PPM	Noise level Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000- 2000	80
Platform	0.0	620 - 630	75.1
Crossover	0.0	550	7.1
Substation	0.0	540	67.0
Ventilation tunnel	0.5	530	73
left tunnel	0.0	560	66.2
Dead ends	0.0	530	60.2

1.6. Measurements implemented by Contractor
12/08/2016

Date of Inspection:	12.08.2016	Project: Tbilisi Metro line-2	Location :Shaft 50c Construction site

Introduction

Under the project Tbilisi Metro line – 2 Contractor cobra assignia health, safety and Environmental department conduct Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Valeri Sadunishvili and Natia Karkuzaevi visited site in order to take measure Co, Co2 and Noise ; The sampling took place at 10:15 In all sections there the activities were in progress, particularly Cross over, Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below - figure 1.

Result

Location	Co mg/m3	Co2 PPM	Noise level Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000 -2000	80
Platform	0.0	510	77.8
Crossover	0.0	550	7.1
Sub station	0.0	540	67.0
Ventilation tunnel	0.5	530	73
Left tunnel	0.0	500	66.2
Dead ends	0.0	530	69.2

1.7. Measurements implemented by Contractor
19/08/2016

Date of Inspection: 10.08.2016 | Project: Tbilisi Metro line 2 Location :Shaft 501 Construction site

Introduction

Under the project Tbilisi Metro line -2 Contractor cobra assigns health, safety and Environmental department conduct Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Valeri Sadunishvili and Natia Kankadze visited site in order to take measure Co, Co2 and Noise ; the sampling took place at 14.40 in all sections there the activities were in progress, particularly cross over, Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. the results are show below figure 1.

Result

Location	Co	Co2	Noise level
	mg/m3	PPM	Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	2000 -2000	80
Platform	0.0	520	78
Crossover	0.0	550	71
Sub station	0.0	540	67.0
Ventilation tunnel	0.5	530	73
Left tunnel	0.0	560	66.2
Dead ends	0.0	530	69.2

1.8. Measurements implemented by Contractor
26/08/2016

Date of Inspection: 26.08.2016 Project: Tbilisi Metro line-2 Location :Shaft 9dc Construction site

Introduction

Under the project Tbilisi Metro line – 2 Contractor cobra assigns health, safety and environmental department conduct Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Valeri Sadumishvili and Nelia Kerkuzaeva visited site in order to take measure CO, Co2 an Noise ; The sampling took place at 15:17 In all sections there the activities were in progress, particularly Cross over, Platform left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below - figure 1.

Result

Location	Co mg/m3	Co2 PPM	Noise level Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000 2000	80
Platform	0.0	510	77.8
Crossover	0.0	560	68.3
Substation	0.0	540	67.0
Ventilation tunnel	0.5	530	73
left tunnel	0.0	560	66.2
Dead ends	0.0	530	69.2

1.9. Measurements implemented by Contractor
02/09/2016

Date of Inspection: 02.09.2016 Project: Tbilisi Metro line-2 Location :Shaft 5dc Construction site

Introduction

Under the project Tbilisi Metro line - 2 Contractor obtains assigns health, safety and Environmental department conduct Atmospheric air samples for chemical analysis and noise measurement in order to, to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Valeri Sadunishvili and Natia Kirkitadze visited site in order to take measure Co, Co2 and Noise ; The sampling took place at 15.45 in all sections there the activities were in progress, particularly Cross over, Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below Figure 1.

Result

Location	Co	Co2	Noise level
	mg/m3	PPM	Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000- 2000	80
Platform	0.0	510	77.8
Crossover	0.0	560	68.5
Sub station	0.0	540	67.0
Ventilation tunnel	0.5	530	73
Left tunnel	0.0	560	66.2
Dead ends	0.0	530	69.2

1.10. Measurements implemented by Contractor
09/09/2016

Date of Inspection: 09.09.2016	Project: Tbilisi Metro line-2 Location :Shaft 50c Construction site

Introduction

Under the project Tbilisi Metro line 2 Contractor cooca assigrila health, safety and Environmental department conduct Atmospheric air samples for chemical analysis and noise measurement.In order to to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Valeri Sadunishvili and Nata Kakuraevi visited site in order to take measure Co, Co2 and Noise ; The sampling took place at 10.45 In all sections there the activities were in progress, particularly Cross over, Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below Figure 1.

Result

Location	Co	Co2	Noise level
	mg/m3	PPM	Db
MPC (maximum Permissible concentration) FOR WORKING AREA -	5.0	1000 -2000	80
Platform	0.0	530 - 550	68.1 - 75.1
Crossover	0.0	550 - 570	71.0
Sub station	0.0	510	68.0
Ventilation tunnel	0.5	540	72.7
Left tunnel	0.0	530	72.1 - 73.1
Dead ends	0.0	560	71.2- 71.7

1.11. Measurements implemented by Contractor
16/09/2016

Date of Inspection: 16.09.2016 Project: Tbilisi Metro line 2 Location :Shaft 50c Construction site

Introduction

Under the project Tbilisi Metro line – 2 Contractor cobra assignis health, safety and Environmental department conduct Atmospheric air samples for chemical analyse and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Valeri Sedonashvili and Nelia Kerkuzeeva visited site in order to take measure CO, CO2 and Noise ; the sampling took place at 11:45 in all sections there the activities were in progress, particularly Crossover, Platform left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below figure 1.

Result

Location	Co	Co2	Noise level
	mg/m3	PPM	Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000 2000	80
Platform	0.0	53.0 – 68.0	68.1 – 75.1
Crossover	0.0	550 - 570	71.0
Sub station	0.0	510	68.0
Ventilation tunnel	0.5	540	72.7
Left tunnel	0.0	530	72.1 – 73.1
Dead ends	0.0	550	71.2 71.7

1.12. Measurements implemented by Contractor
24/09/2016

Date of Inspection:	24.09.2016 Project: Tbilisi Metro line 2	Location :Shaft 50c Construction site

Introduction

Under the project Tbilisi Metro line – 2 Contractor ca.ro assigns health, safety and Environmental department conduct Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Valeri Sodunishvili and Natia Kankuzaevi visited site in order to take measure Co, Co2 and Noise , The sampling took place at 10.55 in all sections there the activities were in progress, particularly Cross over, Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below Figure 1.

Result

Location	Co	Co2	Noise level
	mg/m3	PPM	Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000- 2000	80
Platform	0.0	53.0 55.0	67.7- 68.1
Crossover	0.0	550 570	71.0
Sub station	0.0	510	68.0
Ventilation tunnel	0.5	540	72.7

1.13. Measurements implemented by Contractor 07/10/2016

Date of inspection: 07.10.2016 Project : Tbilisi Metro line-2 Location :Shaft 5A Construction site

Introduction

Under the project Tbilisi Metro line – 2 Contractor cobra assignis health, safety and Environmental department conduct Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Valeri Sadunishvili and Natia Korkuzaevi visited site in order to take measure Co, Co2 and Noise ; the sampling took place at 13.55 in all sections there the activities were in progress, particularly Cross over, Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below - figure 1.

Result

Location	Co mg/m3	Co2 PPM	Noise level Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000- 2000	80
Platform	0.0	51.0 55.0	80.8
Crossover	0.0	570	68.1
Sub station	0.0	510	68.0
Ventilation tunnel	0.5	540	72.7
Left tunnel	0.0	550	73.9
Dead ends	0.0	540	72.7

1.14. Measurements implemented by Contractor
14/10/2016

Date of Inspection:	14.10.2016	Project : Tbilisi Metro line-2	Location :Shoft 5th Construction site

Introduction

Under the project Tbilisi Metro line – 2 Contractor cobra Assign is health, safety and Environmental department conduct Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Valeri Sadunishvili and Nata Kekenadze visited site in order to take measure Co, Co2 and Noise ; The sampling took place at 14:45 in all sections there the activities were in progress, particularly Crossover, Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are shew below figure 1.

Result

Location	Co	Co2	Noise level
	mg/m3	PPM	Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000 2000	80
Platform	0.0	430 – 510	68.1 75.1
Crossover	0.0	550 570	71.0
Sub station	0.0	510	66.0
Ventilation tunnel	0.5	540	72.7

1.15. Measurements implemented by Contractor
21/10/2016

Date of Inspection:	21.10.2016	Project: Chiatura Metro line-2 Location Shaft 5K Construction site

Introduction

Under the project Chiatura Metro line – 2 Contractor subcontractor health, safety and Environmental department conduct Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Levan Gvazava and Natia Korkuzashvili visited site in order to take measure Co, Co2 and Noise ; The sampling took place at 12:15 in all sections where the activities were in progress, particularly Cross over, Platform, left and right tunnel, technical room, ventilation tunnel and dead ends. The results are show below - figure 1.

Result

Location	Co	Co2	Noise level
	mg/m3	PPM	Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000 2000	80
Platform	0.0	570 – 630	68.1 – 75.1
Crossover	0.0	550 570	71.0
Sub station	0.0	510	68.0
Ventilation tunnel	0.0	540	72.7
Left tunnel	0.0	530	72.1 - 73.1
Dead ends	0.0	550	71.2- 71.7

1.16. Measurements implemented by Contractor
10/11/2016

Date of Inspection:	10.11.2016	Project: Tbilisi Metro line-2	Location :Shaft 10c Construction site

Introduction

Under the project Tbilisi Metro line 2 Contractor cobra assigne health, safety and Environmental department conduct Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace for manpower welfare.

General description

Contractor HSE representatives Veleri Sadunishvili and Natia Kerkusevi visited site in order to take measure Co, Co2 and Noise, The sampling took place at 12.45 in all sections there the activities were in progress, particularly Cross over, Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below - figure 1.

Result:

Location	Co	Co2	Noise level
	mg/m3	PPM	Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000- 2000	80
Platform	0.0	510 – 55.0	80.8
Crossover	0.0	510	68.1
Sub station	0.0	510	68.0
Ventilation tunnel	0.5	540	77.7
Left tunnel	0.0	550	73.9
Dead ends	0.0	540	72.7

1.17. Measurements implemented by Contractor
17/11/2016

Date of Inspection:	17.11.2016	Project: Tbilisi Metro line-2	Location :Shaft 50; Construction site

Introduction

Under the project Tbilisi Metro line – 2 Contractor company Assigna Health, Safety and Environmental department conducted Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace for employees welfare.

General description

Contractor HSE representatives Valeri Sadunishvili and Natia Kankuzaevi visited site in order to take measure Co, Co2 and Noise , The sampling took place at 10:45 In all sections there the activities were in progress, particularly Cross over Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below figure 1.

Result

Location	Co	Co2	Noise level
	mg/m3	PPM	Db
MPC (maximum Permissible concentration) HUK WUKKING ARFA	5.0	1000- 2000	80
Platform	0.0	53.0 – 63.0	68.1 75.1
Crossover	0.0	550 - 570	71.0
Sub station	0.0	510	68.0
Ventilation tunnel	0.5	540	72.7
left tunnel	0.0	530	72.1 – 73.1
Dead ends	0.0	550	71.2- 71.7

1.18. Measurements implemented by Contractor
24/11/2016

Date of Inspection: 24.11.2016	Project: Tbilisi Metro line-2	Location :Shaft 50c Construction site

Introduction

Under the project Tbilisi Metro Line – 2 Contractor cobra assignia health, safety and Environmental departments conduct Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantify airborne contaminants in order to determine the level of workplace to ensure proper welfare.

General description

Contractor HSE representatives Levan Gvazava and Mariia Kerkusaeva visited site in order to take measure Co, Co2 and Noise ; The sampling took place at 12:30 in all sections there the activities were in progress, particularly Cross over Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below - figure 1.

Result

Location	Co	Co2	Noise level
	mg/m3	PPM	Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000- 2000	80
Platform	0.0	570 – 63.0	68.1 – 75.1
Crossover	0.0	550 - 570	71.0
Sub station	0.0	510	60.0
Ventilation tunnel	0.5	540	72.9
Left tunnel	0.0	530	72.1 – 73.1
Dead ends	0.0	550	71.2- 71.7

1.19. Measurements implemented by Contractor
14/12/2016

Date of Inspection:	14.12.2016	Project: tbilisi Metro line-2	Location :Shaft 5uc construction site

Introduction

Under the project Tbilisi Metro line – 2 Contractor Lotos Assignis health, safety and Environmental Department conduct Atmospheric air samples for chemical analysis and noise measurement in order to to identify and quantity airborne contaminants in order to determine the level of workplace for manpower welfare

General description

Contractor HSE representatives Valeri Sadunishvili and Natia Karkusaevi visited site in order to take measure Co, Co2 and Noise ; The sampling took place at 11.00 in all sections there the activities were in progress, particularly Cross over, Platform, left and right tunnel, technical rooms, Ventilation tunnel and dead ends. The results are show below - figure 1.

Result

Location	Co	Co2	Noise level
	mg/m3	PPM	Db
MPC (maximum Permissible concentration) FOR WORKING AREA	5.0	1000- 2000	80
Platform	0.0	53.0 63.0	68.1 – 75.1
Crossover	0.0	550 - 570	71.0
Sub station	0.0	510	68.0
Ventilation tunnel	0.5	540	72.7
Left tunnel	0.0	530	72.1 – 73.1
Dead ends	0.0	550	71.2 71.7

Attachment 2: Measurements of Environmental Agency SUBTERRANEA WATER: 8/12/2016

საქართველოს გარემოსა და ბუნებრივი რესურსების დაცვის სამინისტრო
MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES PROTECTION OF GEORGIA

გარემოს ეროვნული სააგენტო
NATIONAL ENVIRONMENTAL AGENCY

№ 12/1-1164 08 12 2016წ.

უსფ"თბილისის მეტროს ხაზი 2"-ს უფლებამოსილ
წარმომადგენელს **ბ-ნ ალეხანდრო ხუსტ როდრიგოს**

ბატონო ალეხანდრო,

საქართველოს გარემოსა და ბუნებრივი რესურსების დაცვის სამინისტროს სსიპ "გარემოს ეროვნულ სააგენტო"-სა და უსფ "თბილისის მეტროს ხაზი 2"-ს შორის 2016 წლის 26 ოქტომბერს გაფორმებული ფმ 3/943 ხელშეკრულების თანახმად, გაწვდით ქ. თბილისში, ვაჟა-ფშაველას გამზირზე თქვენს მიერ მითითებულ ტერიტორიიდან აღებული, მიწისქვეშა წყლის სინჯების ქიმიური და ბაქტერიოლოგიური ანალიზის შედეგებს.

დანართი: 5 (ხუთი) გვ.

პატივისცემით,

სააგენტოს უფროსი **თამარ ბაგრატია**

ფ. აღმაშენებლის გამ. 150, 0112, თბილისი, საქართველო
150 D. AGMASHENEBELI AVE, 0112, TBILISI, GEORGIA
Tel.: +995 32 2439502 FAX: +995 32 2439503
E-mail: info@meteo.gov.ge Web: www.meteo.gov.ge

გარემოს ეროვნული სააგენტო
გარემოს დაბინძურების მონიტორინგის დეპარტამენტი

ატმოსფერული ჰაერის, წყლისა და
ნიადაგის ანალიზის ლაბორატორია

www.nea.gov.ge

გამოცდის ოქმი №131ა- 2016

რეგისტრირებული სინჯის ნომერი: №1423, №1424

გამოცდის ოქმის გვერდების რიცხვი: 4

დამკვეთის სახელი: უსფ „თბილისის მეტროს ხაზი 2"

დამკვეთის მისამართი: ქ. თბილისი, 0104, ძმები ზუბალაშვილების ქ. №27/9

ტელ.: 995(32) 591 70 74 04

დამკვეთის მიერ მიცემული ეტიკეტი: №1, №2

სინჯის აღწერა და იდენტიფიკაცია (მატრიცა, ფორმა): მიწისქვეშა წყალი

გამოყენებული მეთოდი/ხელსაწყო: ICP-OES

სინჯის მიღების თარიღი: 07.11.2016

გამოცდის ჩატარების თარიღი: 07.11.2016-14.11.2016

გამოცდის ოქმის გაცემის თარიღი: 14.11.2016

გარემოს ეროვნული სააგენტო
გარემოს დაბინძურების მონიტორინგის დეპარტამენტი

ატმოსფერული ჰაერის, წყლისა და
ნიადაგის ანალიზის ლაბორატორია

www.nea.gov.ge

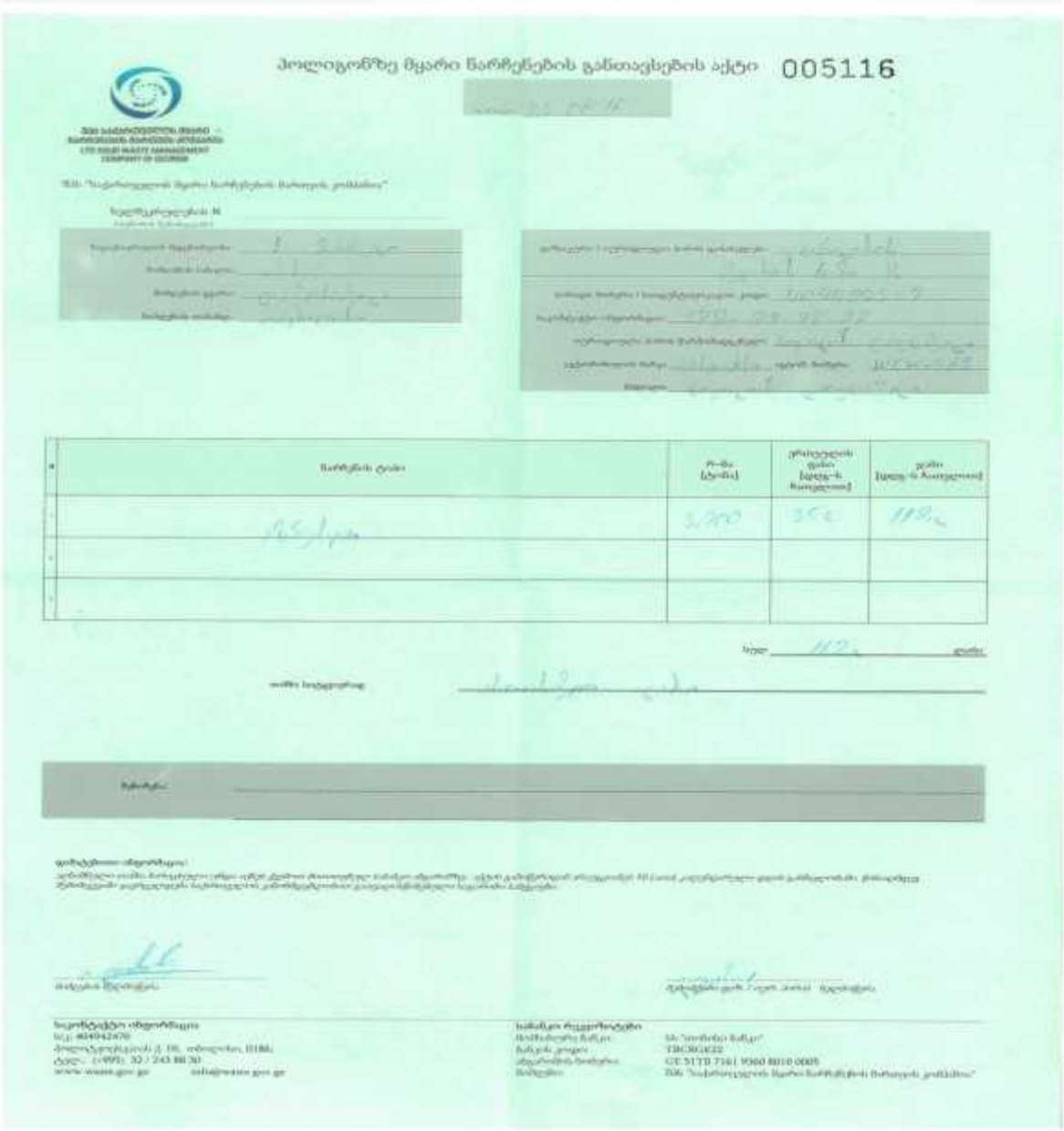
ბსდ 6

№1423 (1)

„მეტრო" – 7+280 ნიშნული

№	დასახელება	ერთეული	გაზომვის შედეგები	გამოყენებული მეთოდი
1	სიმღვრივე (ტურბულენტობა)	NTU	0.43	ფოტომეტრული
2	მინერალიზაცია	მგ/ლ	578,71	
3	ტუტიანობა	მგ/ლ	202,0	ტიტრიმეტრული
4	სიხისტე	მგ.ექვ/ლ	6,30	ტიტრიმეტრული
5	ქქმ	მგ/ლ	9,8	ISO 6060:2010
6	ამონიუმი	მგN/ლ	0.327	ISO 7150-1:2010
7	ნიტრიტი	მგN/ლ	0,246	ISO 10304-1:2007
8	ნიტრატი	მგN/ლ	1,624	ISO 10304-1:2007
9	ფოსფატი	მგ/ლ	0,065	ISO 10304-1:2007
10	სულფატები	მგ/ლ	167,95	ISO 10304-1:2007
11	ქლორიდები	მგ/ლ	10,93	ISO 10304-1:2007
12	ფტორი	მგ/ლ	0,412	ISO 10304-1:2007
13	ბრომი	მგ/ლ	0,107	ISO 10304-1:2007
14	ჰიდროკარბონატები	მგ/ლ	246,44	ტიტრიმეტრული
15	კალიუმი	მგ/ლ	1,4	ISO 9964-3:2010
16	ნატრიუმი	მგ/ლ	24,5	ISO 9964-3:2010
17	კალციუმი	მგ/ლ	108,98	ISO 6058:2008
18	მაგნიუმი	მგ/ლ	10,51	ISO 6058:2008
19	ტოტალური კოლიფორმები	1 ლ-ში	არ აღმოჩნდა	მემბრანული ფილტრაციის მეთოდი
20	ფეკალური სტრეპტოკოკები	1 ლ-ში	არ აღმოჩნდა	მემბრანული ფილტრაციის მეთოდი
21	E-Coli	1 ლ-ში	არ აღმოჩნდა	მემბრანული ფილტრაციის მეთოდი

Attachment 3: Asbestos disposal act



პოლიგონზე მყარი ნარჩენების განთავსების აქტი 005116

Attachment: 4.1. Air test results:

საქართველო
შ.პ.ს „ლაბორატორიული
კვლევის ცენტრი"

Georgia
L.T.D „Laboratory
Researche Center"

ქ. ფოთი მიქაბერიძის ქ. №2 ტელ: (0493 22-17-35) POTI Miqaberidze st. №2 Tel: (0493 22-17-35)

Air Test Result

Name of employer JSC "Hydro Engineering Company"
Sample Description: Air
Sample Location Construction of coastal Protection Facility in Anaklia
Research Objective: Bacterial and Chemical Indication
Date of sample collection 06.10.2016
The number of Act # 923 / 27

Bacterial and Chemical Indicators	Discovered Composition	Maximum Permissible Concentration
Mesophiles and Micro Particles	50 p.u.	
Dust	0,16 gr/l	
Background radiation	0,015 micro/h	

Performer: Physician Laboratorian: R. Komakhidze
The Laboratory Supervisor: L.mamaladze
Result date: 10.10.16

Measurements: Attachment 4.2: Seawater test results:

The Act of Test Result № 111

„06„ October„ 2016

Client: L.T.D „Hydro Engineering Company"

Sample Description: Sea Water

Sample Location: Time. The number of Act №923; The Construction Site, Anaklia; 06.10.16, 13^{00} o'clock.

Description of Normative Document: Government Resolution of Georgia №425 31.12.13. Technical Resolution for the Protection of Surface Water from the Pollution: Resolution of the Government of Georgia №26 03.01.2014: Technical Resolution for the Approval Regulations of Taking Sea Water test sample.

Starting and completion Date, Time: 06.10.16, 10.10.16.

The Act of Test Result have been given for the submitted sample:

Chemical Indicators

2	Turbidity	-	GOSTI3351-74
3	Colour	5^0	GOSTI3351-74
4	Hardness	-	GOSTI 4151-72
5	Calcium	-	LURIA PG.118
6	Mg	-	LURIA PG.122
7	Hydrogen Indicators	-	ISO 10523-08
8	Dissolved Oxygen	-	LURIA GV.176
9	Oxygen's Chemical Requirement	-	LUIA PG.74
10	Biochemical Usage of Oxygen. Usage of Oxygen 5 and Total Usage of Oxygen.	-	LURIA PG.82
11	Dry Residue	15000 mg/l	GOSTI 18164-72
12	Nitrates	-	GOSTI 18826-73
13	Chloride	-	GOSTI 4245-72
14	Hydrogen Sulphide	-	LURIA PG.412
15	Nitrite	-	GOSTI 4192-82
16	Iron	-	GOSTI 6332
17	Arsenic	-	GOSTI 4152-89
18	Copper	-	GOSTI 4388-72
19	Sulphates	-	GOSTI 4389-78
20	Manganese	-	GOSTI 4974-72

21	Polyphosphates	-	GOSTI 18309-72
22	Suspended Particulates	190 mg/l	LURIE pg.43
23	Floating particles	-	GONCHATUKI pg-66
24	Ammonia	-	GOSTI 4192-82
25	The acidity/ alkalinity	-	LURIE pg-57.51
26	Permanganate Oxygen	-	ISO 8467-93
27	Petroleum products	0,1 mg/l	LURIE pg.306
28	Background radiation	-	

№	Description of Determining Characteristics	Detected Concentration	Documentation of Technical Normative
1	Mesophiles Aerobic and Facultative Anaerobes Micro Organisms	-	ISO 6222:1999
2	Total Coliforms	-	ISO 9308-1-2007
3	E. Coli	-	ISO 9308-1-2007
4	Salmonella	-	ISO 19250:2010
5	Str. faecalis	-	ISO 7899-2:2000
6	Thermo tolerant coliforms	-	ISO 9308.2:2012
7	Sulphide Reducing Clostridium	-	ISO 6461-2-1986

The Chief of Research Laboratory Canter: ---------- /Ts. Daushvili/

Attachment 5: Letter of Submission the draft of Company Waste Management Plan to the MOEPNR

"თბილისის მეტროს ხაზი 2"
ქ.თბილისი, ყიფიანის ქ. N29

თარიღი: 21.12.2016

Ref: JVCA/ SUTIP1-255

პროექტი: "თბილისის მეტროს ხაზი 2"
კონტრაქტის ნომერი: N P42414-SUTIP1-ICB-1.05-1
თემა: ნარჩენების მართვის გეგმა
თქვენ წერილის ნომერი:
ჩვენი წერილის ნომერი :
ვის: გარემოსა და ბუნებრივი რესურსების დაცვის მინისტრს ბატონ გიგლა აგულაშვილს
ასლი:

ბატონო გიგლა

სამშენებლო კომპანია „თბილისის მეტროს ხაზი– 2" აწარმოებს საბურთალოს ხაზის გაფართოებას და ახალი მეტრო სადგურ „უნივერსიტეტი"–ს მშენებლობას ვაჟა ფშაველას გამზირისა და სანდრო ეულის ქუჩის კვეთაზე.

ნარჩენების მართვის კოდექსის მე–14 მუხლების თანახმად, (მე-14 მუხლის პირველი პუნქტის შესაბამისად „ფიზიკური ან იურიდიული პირი, რომლის საქმიანობის შედეგად წლის განმავლობაში 200 ტონაზე მეტი არასახიფათო ნარჩენი ან 1000 ტონაზე მეტი ინერტული ნარჩენი ან ნებისმიერი რაოდენობის სახიფათო ნარჩენი წარმოიქმნება, ვალდებულია შეიმუშაოს კომპანიის ნარჩენების მართვის გეგმა"), წარმოგიდგენთ ნარჩენების მართვის გეგმას.

დამატებითი ინფორმაციისთვის დაგვიკავშირდით ნომერზე 591 707 404

კარლოს მუნიოსი
სამშენებლო კომპანია „თბილისის მეტროს ხაზი–2 „
პროექტის მენეჯერი

საქართველოს
გარემოსა და ბუნებრივი რესურსების
დაცვის სამინისტრო
№
„22" 12 2016 წ

2727220

Dimitri Kipiani N 3/29 App.10 , Tbilisi Georgia