Semi-annual Environmental Monitoring Report

#8 Semestral Report

Reporting period: July-December 2025

January 2025

Batumi Bypass Road Project— Construction of Poti Bridge and Access Roads

(Financed by the Asian Development Bank)

Loan No GEO 3520-GEO

Prepared by the Roads Department of the Ministry of Regional Development and Infrastructure of Georgia for the Asian Development Bank.

ACRONYMS & ABBREVIATIONS

ADB	Asian Development Bank
CAREC	Central Asia Regional Economic Cooperation
CC	Construction Contractor
CLO	Community Liaison Officer
CPR	Cardiopulmonary Resuscitation
EHS	Environment, Health and Safety
EIA	Environmental Impact assessment
EMP	Environmental Management Plan
EMR	Environmental Monitoring Report
GRM	Grievance Redress Mechanism
H&S	Health and Safety
IFC	International Finance Corporation
km	Kilometer
MAC	Maximum Allowable Concentration
Ministry	Ministry of National Development and Infrastructure
MoEPA	Ministry of the Environmental Protection and Agriculture
NCR	Non-Conformance Report
PAM	Project Administration Manual
PIU	Project Implementation Unit
PMCS	Project Management Consultancy Services
PPE	Personal Protective Equipment
RD	Roads Department
SAEMR	Semi-annual Environmental Monitoring Report
SC	Supervision Consultant
SEMP	Specific Environmental Management Plan
SSEMP	Site Specific Environmental Management Plan
TEM	Trans-European North-South Motorway
ToR	Terms of Reference
WWF	World Wildlife Fund

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1 INTRODUCTION

1.1 Preamble

1. Batumi Bypass Road Project: Major Change in the Project (Change in Scope, Amount, and Implementation Arrangements) was conducted in September 2019. The significant change is an increase in project scope through the addition of a fourth output under the project comprising two additional construction subprojects: a new bridge and approach roads over the Rioni River in Poti and a new bypass road from Bakurtsikhe to Tsnori. Reallocation of existing savings can be utilized to fund the new output, reinforcing the project's impact of improving regional connectivity in Georgia. The change is significant because it fundamentally affects the approved project scope and outcome by doubling the length of roads and/or bridges to be built.

2. The project, managed by the Roads Department under the Ministry of Regional Development and Infrastructure, aims at the Construction of the Poti Bridge and Access Roads, financed by the Asian Development Bank (ADB).

3. This report is the eighth Semi-Annual Environmental Monitoring Report (SAEMR/EMR) for constructing the Poti Bridge and Access Roads Project and covers the period of July – December 2025.

4. The Contract for Project Management Consultancy Services (PMCS) between Roads Department (RD) and "Joint Venture ULUSLARARASI BİRLEŞMİŞ MÜŞAVİRLER MÜŞAVİRLİK HİZMETLERİ A.Ş-IRD Engineering SRL" was signed on 11 June 2021. The Contract for the Construction of the Poti Bridge and Access Roads between RD and Joint Venture MIRBUD-CS (Poland, Georgia) was signed on 29 November 2021. Work is expected to be completed within two years. However, there is extensions to the project timeline, with completion anticipated before the end of 2026. Awarded contracts included Environmental Management Plans (EMP) cleared by ADB and conditions of national Environmental Impact Assessment (EIA) clearance.

2 PROJECT DESCRIPTION AND CURRENT ACTIVITIES

2.1 Project Description

5. The Poti-Grigoleti-Kobuleti bypass section is part of the E-60 and E-70 highways and the larger East-West Road corridor in Georgia, which is an integral part of one of the six key Central Asia Regional Economic Cooperation (CAREC) corridors (Corridor 2) providing the shortest transit link to connect Central Asia with Europe and East Asia. The Project is located along the Black Sea coastal area within the Samegrelo-Zemo Svaneti Region and on the border between Khobi Municipality and the Poti administrative center.

6. The details of the proposed road project are as follows: The 2.5 km road Project consists of a 2-lane (one lane in each direction) multi-span bridge over the Rioni River and its connection with the existing highway on both sides of the river. The starting point is located on the E-60 highway to Senaki at the right riverbank of the Rioni River on the northern outskirts of the city of Poti. The new section of road will pass next to a residential area (Patara Poti Village) using the exact alignment and parallel to the existing railway bridge over the river. In addition, a small section (approximately 1 km) of an existing secondary road that runs to the Kulevi Oil Terminal from Patara Poti and parallels the river will also be upgraded with a modified alignment to accommodate the new bridge and road approaches.

7. The Project's geometric design standards have been selected based on traffic flow, road category, and relief to ensure safe and unimpeded traffic flow (see Table 1). The road design is based on Georgian National Standard SST 72: 2009 "Standard on Geometrical and Structural Requirements for the Public Motor Roads of Georgia" and Trans-European North-South Motorway (TEM) Standards.

Table 1. Design Parameters

Parameter	Main Alignment	Interchanges: Ramps and Loops
Design speed	100 km/h	40 km/h, 60 km/h, 80 km/h or 100 km/h
Speed limit	90 km/h	90 km/h
Spiral Transition Curves	As per TEM Standards	As per TEM Standards
Bend (Superelevation)	As per Georgian Standards	As per Georgian Standards
Min. crossfall and min. bend	2,50%	2.50%
Max. superelevation	7,00%	7.00%
Expansion width in curves	No necessary widening (each lane is 3,75 m wide)	As per Georgian Standards
Min. Vertical Gradient	0.30%	0.30%

Max. Vertical Gradient	4.00%	5% (100 km/h) and 6% (<100 km/h)
Convex Vertical Curves	22.600	10,000 (100 km/h), 5,000 (80 km/h), 1,800 (60 km/h), 400 (40 km/h)
Concave Vertical Curves	7.700	4,900 (100 km/h), 3,200 (80 km/h), 1.700 (60 km/h), 850 (40 km/h)
Acceleration Lane	-	150 m acceleration lane + 80 m taper
Deceleration Lane	-	100 m deceleration lane + 80 m taper

8. The map of the project road is given in Figure 1 below.

Figure 1. Map of Project Road

9. The Project is classified as category A for the environment under ADB's Safeguard Policy Statement (2009). Project implementation period is between 2021 and 2026.

10. The Roads Department of Georgia, under the Ministry of Regional Development and Infrastructure of Georgia, submitted the EIA to the Ministry of the Environmental Protection and Agriculture of Georgia (MoEPA) on 26.02.2018 for approval. Based on the submitted documentation, Environmental Decision was issued by the MoEPA on 26.04.2018 (order N2-284).

2.2 Project Contracts and Management

11. Following the EIA and the Project Administration Manuel (PAM) requirements, the Project Management Consultancy Services Company (hereafter, referred as the Engineer) and Construction Contractor (CC) have mobilized national and international Environmental, Health and Safety (EHS) specialists (the names for the Engineer and Construction Contractor (CC) staff are presented in Table 2).

12. The Terms of References (ToR) for the Project Management Consultancy Services Company contains the following tasks for the Environmental Specialists:

a. Ensure that the provisions of the approved Environmental Management Plan are reflected in the Contractor's contract site-specific environmental management plan (SSEMP) before its acceptance by the Engineer, the Employer, and ADB after that, ensure that the Contractor complies in every respect with the provisions of the SSEMP;

b. Develop an environmental auditing protocol for the construction period, regularly supervise the environmental monitoring, and submit periodic reports based on the monitoring data and laboratory analysis reports. These reports will be included as an annex to the Consultant's Monthly Report;

c. Develop a program for hands-on training of Contractor's staff in implementing the SSEMP.

d. Conduct Post-Construction Environmental Audit and prepare a post-construction environmental audit report with a filled environmental audit checklist.

13. The names of ADB, the Engineer, CC, and RD representatives are given in Table 2 below.

Table 2. Main Environmental Staff of ADB, CC, the Engineer, and RD

Organization	Position	Name
ADB	Head Office, Environmental Specialist, Portfolio, Results, Safeguards and Gender Unit (PSG), CWRD	Ninette Pajarillaga
	ADB National Environmental Safeguards Consultant	Giorgi Kobaladze
	Associate Safeguards Officer Georgia Resident Mission	Nino Nadashvili
RD	Environmental Specialist	Tamar Nasuashvili
	Head of Environmental Unit	Gia Sopadze
Engineer	International Environmental Specialist	Emre Duran
	Environmental Expert	Keti Nadirashvili
CC	Project Manager	Nino Gabunia
	Environmental Specialist	Ana Kvaratskhelia

2.3 Project Activities during the Current Reporting Period for Construction of Poti Bridge and Access Roads

14. Within the scope of the project, construction activities continued progressively between July and December, including material transportation, embankment works, pile construction, concrete works, and superstructure-related activities across Axes 14, 17, and 49.
15. During this period, key works such as cast in situ pile boring and cut-off, gravel columns for soil improvement, reinforcement and formwork installation, concrete casting for piles, abutments, columns, and crossbeams, as well as roadside safety structures and expansion joints were carried out.
16. In addition, structural steel fabrication and installation, leveling and compaction of fill, riverbed widening, temporary works, and auxiliary activities were implemented in line with the approved construction schedule, as detailed in Table 3 below.

Table 3. Project Activities Carried Out during the Reporting Period

Month	Activity
July	Transportation sand-gravel materials from borrow - Axe 17 km 1+255-1+500; Transportation of crashed aggregate 15-40mm - Axe 17, km 0+200; Construction of temporary island - Axe 17 km 0+895-0+980; Reinforcement steel B500C - Axe 14, km 0+060; Axe 49, km 0+374

	Boring of Cast in situ piles d1500mm with steel casing pipes, including pile cut off (pier N2, pile N35, 39, 29) - Axe 17, km 0+989 Concrete for Piles, C30 - Axe 17, km 0+989 Selected material on top layer of embankment, included additional transport distance - Axe 17 km 0+400-0+620 Transportation of crashed aggregate 0-60mm - Axe 17, km 0+400 Concrete for leveling pad C15 - Axe 17, km 0+989 Formwork - Axe 14, km 0+060 Pile cut off - Axe 17, km 0+989 Excavation of ditches and shafts, loading on dump trucks and transportation to dumpsite. - Axe 17, km 0+989 Sliding finger expansion joint for movements - Axe 14 km 0+060; Concrete for Superstructure C35/45 - Axe 14 km 0+060;
August	Transportation sand-gravel materials from borrow - Axe 17 km 1+255-1+500; Transportation of crashed aggregate 15-40mm - Axe 17, km 0+200; Roadside safety structure made of concrete parapet single-faced C35, (Axe-14) - Axe 14, km 0+060 Reinforcement steel B500C - Axe 14, km 0+060; Axe 49, km 0+374 Concrete for leveling pad C15 - Axe 17, km 0+989 Pile cut off - Axe 17, km 0+989 Transportation of crashed aggregate 0-60mm - Axe 17, km 0+400 Formwork - Axe 14, km 0+060 Gravel Column for improving soil - Axe 17, km 0+680 - 0+807;
September	Transportation sand-gravel materials from borrow - Axe 17, km 0+680 - 0+807; Transportation of crashed aggregate 15-40mm - Axe 17, km 0+200; Roadside safety structure made of concrete parapet single-faced C35, (Axe-14) - Axe 14, km 0+060; Axe 49, km 0+374 Reinforcement steel B500C - Axe 14, km 0+060; Axe 49, km 0+374; Axe 17, km 0+989 Transportation of crashed aggregate 0-60mm - Axe 17, km 0+400 Formwork - Axe 14, km 0+060; Axe 49, km 0+374 Gravel Column for improving soil - Axe 17, km 0+140 - 0+200; Concrete for abutment, C30 - Axe 49, km 0+374 Arrangement of filter layer - Axe 17 km 0+680-0+807; Arrangement of geotextile - Axe 17 km 0+680-0+807;
October	Transportation sand-gravel materials from borrow - Axe 17, km 0+680 - 0+807; Transportation of crashed aggregate 15-40mm - Axe 17, km 0+200;

	Transportation of crashed aggregate 0-60mm - Axe 17, km 0+400 Structural steel type S355J2W+N, Including fabrication and transportation (weathering steel) – axe 17 km0+807; Assembly and casting work for mold production of interlocking Lego-type blocks and "daisy" elements. - axe 17 km 0+807; Concrete for column and crossbeam – axe 17, km 0+989.19 Reinforcement steel B500C - Axe 17, km 0+989.19; Leveling and compaction of fill, from borrow, by layers, included additional transport distance. - Axe 17, km 0+680 - 0+807;
November	Transportation sand-gravel materials from borrow - Axe 17, km 0+680 - 0+807; Transportation of crashed aggregate 15-40mm - Axe 17, km 0+200; Transportation of crashed aggregate 0-60mm - Axe 17, km 0+400 Structural steel type S355J2W+N, Including fabrication and transportation (weathering steel) – axe 17 km0+807; Assembly and casting work for mold production of interlocking Lego-type blocks and "daisy" elements. - axe 17 km 0+807; Concrete for column and crossbeam – axe 17, km 0+989.19 Reinforcement steel B500C - Axe 17, km 0+989.19; Leveling and compaction of fill, from borrow, by layers, included additional transport distance. - Axe 17, km 0+680 - 0+807;
December	Transportation sand-gravel materials from borrow - Axe 17, km 0+680 - 0+807; Transportation of crashed aggregate 15-40mm - Axe 17, km 0+200; Transportation of crashed aggregate 0-60mm - Axe 17, km 0+400 Gravel Column for improving soil – axe 17, 0+140 – 0+200 Widening of river bed (Poti area); Structural steel type S355J2W+N, Including fabrication and transportation (weathering steel) - axe 17 km0+807; Leveling and compaction of fill, from borrow, by layers, included additional transport distance. - Axe 17, km 0+680 - 0+807; temporary Peninsula expansion works (partial dismantling of metal sheet piles) - Axe 17, km 0+680 - 0+807; Selected material on top layer of embankment, included additional transport distance. - Axe 17, km 0+620 - 0+807; transportation of selected material (Sand-gravel) 0-120 – axe 17 km 0+300

2.4 Information on Personnel Working at the Construction Site

17. Overall, the Contractor has hired a total of 94 personnel as of December 2025. The details of these Contractor's (CC's) personnel can be found in Table 4. Furthermore, Table 5 provides information on the monthly changes in staff hiring. It is important to note that all of the hired personnel are local.

Table 4. Information of Personnel Working at Site as of December 2024

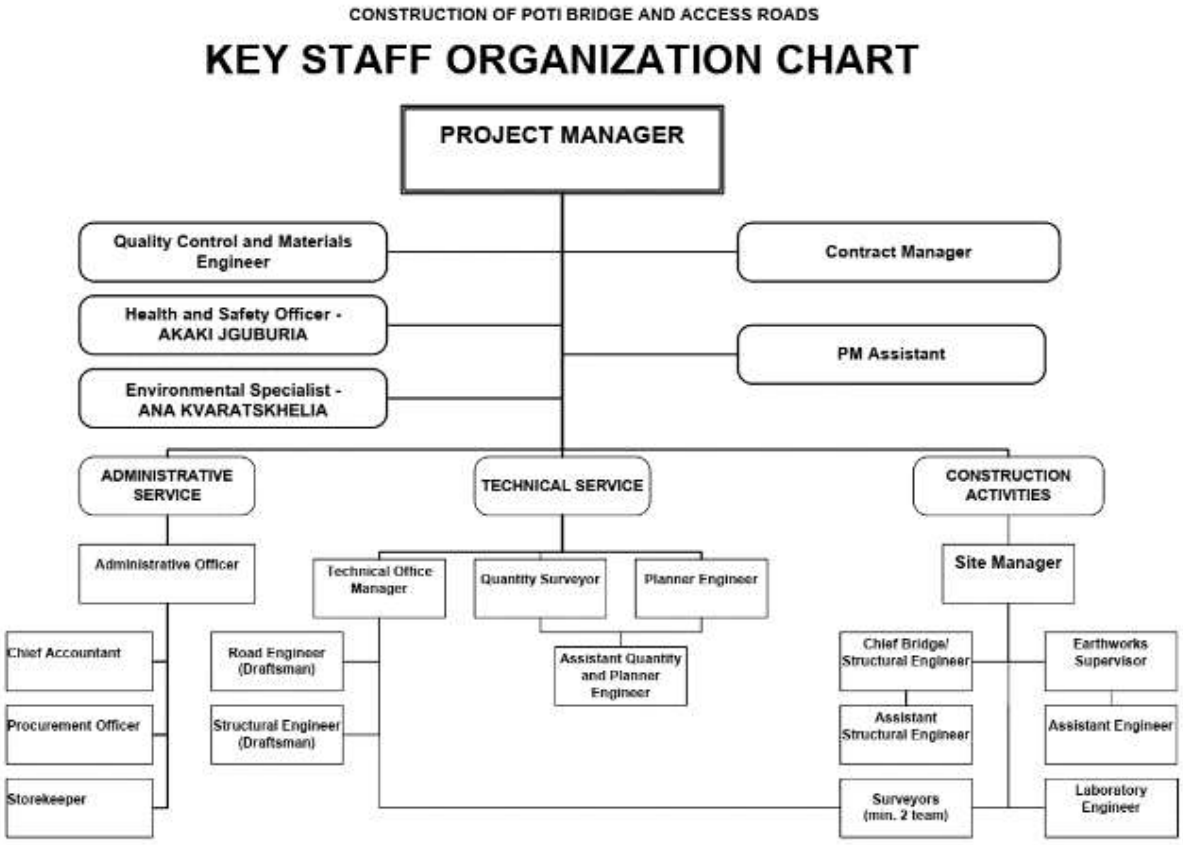
#	**Human Resources**	**Total**
1	Project manager	1
2	Assistant project manager	1
3	Drilling manager	1
4	Warehouse manager	1
5	Environmental specialist	1
6	Health and safety manager	1
7	Site manager	2
8	Transport manager	1
9	Site engineers	2
10	Surveyors	1
11	Operators	41
12	Skilled workers	18
13	Unskilled workers	12
14	Security	9
15	Janitor	2
	TOTAL	**94**
HSE Staff (breakdown of 2 personnel)		
1	Lasha Khurtsidze	H&S Officer
2	Ana Kvaratskhelia	Environmental officer

Table 5. The Monthly Change of the Personnel

	Jul 2025	**Aug 2025**	**Sep 2025**	**Oct 2025**	**Nov 2025**	**Dec 2025**
Personnel	99	98	94	96	94	94

18. The Project organization chart for key management staff is provided in Figure 2.

Figure 2. The Key Staff Organization Chart of CC



2.5 Description of Any Changes to Project Design for Construction of Poti Bridge and Access Roads

19. No changes were made to the agreed-upon Project Design during this reporting period.

2.5 Description of Any Changes to Agreed Construction Methods for Construction of Poti Bridge and Access Roads

20. No changes were made to the agreed-upon construction methods during this reporting period.

3 ENVIRONMENTAL SAFEGUARD ACTIVITIES

3.1 General Description of Environmental Safeguard Activities

21. The Engineer has employed a local environmental specialist since the commencement of the Project. Additionally, Emre Duran was appointed as the International Environmental Specialist in June 2022. On the other hand, the Contractor hired an environmental specialist at the beginning of October 2022. The environmental specialists from both the Engineer and Contractor teams are working together to assess the environmental impacts caused by the construction activities and ensure compliance with the requirements of the Environmental Impact Assessment (EIA), Site-Specific Environmental Management Plan (SSEMP), and topic-specific Environmental Management Plans (EMP). Please refer to Supplementary Documents 1 for the EMP.

22. Both the Engineer's and Contractor's environmental teams conduct regular site visits to monitor SSEMP compliance. Additionally, both the Contractor and Engineer have dedicated Health and Safety (H&S) teams, which also conduct regular site visits to ensure compliance with Personal Protective Equipment (PPE), traffic safety, and other safety-related issues. Detailed information about the environmental site visits can be found in Section 3.2, 'Site Audits'.

23. During the reporting period no grievances have been received or recorded.

3.2 Site Audits

24. Ms. Keti Nadirashvili was appointed as the Local Environmental Specialist in February 2025. Since her appointment, she has conducted regular weekly and monthly site visits, covering both the office facilities and active construction areas.
25. The site visits involve visual inspections of the construction activities. A photographic record of these audits is available in Supplementary Document 2.
26. During this reporting period, both the Local and International Environmental Specialists identified several issues related to hazardous waste management, general site organization, oil spills, and the storage conditions of hazardous materials. The Contractor was instructed to implement corrective measures, including the proper collection and use of designated storage areas for hazardous waste, adequate segregation and disposal of different waste streams, and improvements to the storage practices for hazardous substances in line with the approved Environmental Management Plan.
27. Two Non-Conformance Reports (NCRs) were issued in relation to environmental issues identified during site inspections (*see* Supplementary Document 8).
28. The first NCR was issued in response to the discharge of concrete slurry and construction debris from the peninsula area into the Rioni River. Accumulated residues were observed along the riverbank of the artificial island, presenting a direct risk to surface water quality and indicating non-compliance. Following the issuance of the NCR, the Contractor undertook

immediate corrective action. All visible concrete residues and debris were removed from the riverbank and adjacent areas within two days, and disposal was carried out in accordance with approved waste management practices. The Contractor was further instructed to reinforce controls to prevent any recurrence, including improved containment measures during concrete works and increased supervision of material handling activities near water bodies.

29. The second NCR addressed the ongoing issue of oil and fuel spills observed in key operational areas, including the Material Storage Area, Workshop, Vehicle Maintenance Area, and Fuel Filling Area. Repeated instances of uncontained spills represented a violation of the Environmental Management Plan and Hazardous Waste procedures, creating a significant risk of soil and surface water contamination and regulatory non-compliance.
30. After the NCR was issued, a comprehensive cleanup of all identified oil and fuel spills was carried out across the site. All oil-contaminated materials were collected and transferred to a licensed hazardous waste contractor for proper disposal. The Contractor was instructed to strengthen spill prevention measures, improve housekeeping in operational areas, and ensure the availability and use of spill response kits to prevent recurrence.

3.3 Issues Tracking (Based on Non-Conformance Notices)

Environmental Issues

31. Throughout the reporting period, the Engineer's environmental team conducted regular site visits to the construction areas to identify and address environmental issues. These inspections focused on hazardous material management practices, including the handling and storage of fuel and other hazardous substances, as well as the assessment of general and hazardous waste management for compliance with applicable regulations. Fuel and oil spill prevention and cleanup measures were closely monitored, alongside dust control practices due to their potential impact on air quality. In addition, the team reviewed topsoil management practices to ensure that excavation and construction activities preserved topsoil and that disturbed areas were reinstated appropriately.
32. As noted above, the majority of environmental issues identified during site inspections were communicated to the Contractor and were generally resolved within an acceptable timeframe. However, delays in responding to and cleaning oil spills were repeatedly observed during the reporting period. This concern was formally reiterated to the Contractor, emphasizing the need for faster and more effective spill response and a NCR was issues for remedial action.
33. During the reporting period, the Contractor was formally required to ensure that any oil spill was immediately controlled upon detection, fully contained within one hour, and completely cleaned within the same working shift or, at the latest, by the end of the following day. These response timeframes were defined as mandatory environmental performance requirements for the project. Compliance was subject to verification by the Engineer's environmental team through site inspections and photographic records. Failure to meet these requirements was stipulated to result in formal enforcement actions, including the issuance of an NCR and,

where necessary, the temporary suspension of related activities until satisfactory corrective measures were implemented.

34. Environmental risks and the effectiveness of mitigation measures varied seasonally over the July–December period. During the summer months, elevated temperatures and prolonged dry conditions significantly increased the risk of dust generation, particularly along access roads, excavation areas, and stockpiles. The Engineer's environmental team closely monitored these conditions and verified that the Contractor implemented appropriate dust suppression measures, such as regular water spraying and temporary surface stabilization. The effectiveness of these controls under varying wind conditions was also assessed to ensure compliance with air quality requirements and to minimize nuisance to nearby communities.
35. In contrast, the winter months introduced challenges associated with increased precipitation, lower temperatures, and reduced daylight hours, which affected soil stability, waste handling, and spill response efficiency. During this period, the environmental team placed particular emphasis on stormwater management, ensuring that sediment control and drainage measures were properly maintained to prevent runoff-related contamination. Wildlife protection measures were also applied in a seasonally adaptive manner; for example, construction activities in the Rioni River were scheduled to avoid sensitive breeding and migration periods. These targeted, season-specific measures supported continued environmental compliance and effective risk management throughout the reporting period.

Health and Safety Issues (Based on Non-Conformance Notices)

36. The Health and Safety (H&S) teams of both the Engineer and the Contractor are independently monitoring key H&S aspects across the construction sites. These include:

- Working at height
- Use of power tools and equipment
- Lifting gear
- Housekeeping
- Electrical safety and energy management
- Excavation safety
- Use of Personal Protective Equipment (PPE)

37. During the reporting period, a total of six (5) Non-Conformance Reports (NCRs) were issued in relation to H&S practices. These NCRs addressed deficiencies such as unsafe conditions for electrical shock, lack of guardrails and solid walkway, improper usage of cutting and clearance equipment without PPE, Improperly installed scaffolding, welding and cutting operation with safety violations, improper storage of oxygen cylinders, and inadequate use of PPE.

3.4 Trends

38. Environmental and health and safety performance during the July–December reporting period indicates a pattern of recurring, predominantly operational-level non-conformances, alongside

gradual improvement following corrective actions.

39. From an environmental perspective, issues continued to concentrate on hazardous material and waste management practices, particularly oil and fuel spill control, storage of hazardous substances, and site housekeeping. While most environmental non-conformances were addressed within acceptable timeframes after intervention by the Engineer's environmental team, repeated observations suggest that preventative controls and workforce awareness require further strengthening to reduce recurrence rather than relying on reactive clean-up measures.
40. In terms of health and safety performance, the issuance of H&S-related NCRs reflects persistent challenges in fundamental safety practices. Recurrent deficiencies were identified in working at height arrangements, electrical safety, scaffolding installation, and the consistent use of personal protective equipment (PPE). Unsafe conditions related to welding and cutting operations, improper storage of gas cylinders, and inadequate housekeeping further indicate gaps in daily supervision and task-level risk management. Although corrective actions were implemented following NCR issuance, the nature of the findings suggests a need for enhanced site-level supervision, refresher training, and stricter enforcement of safe work procedures.
41. Overall, the combined Environmental and HSE trends demonstrate that while the Contractor has generally responded to identified non-conformances, sustained improvement depends on shifting focus from corrective action to prevention. Strengthening toolbox talks, increasing management presence on site, and reinforcing accountability at supervisory level are expected to contribute to improved compliance.
42. No community health and safety incidents were recorded during the reporting period; however, environmental protection near sensitive receptors and occupational safety in high-risk activities remain priority areas for continued monitoring and proactive management in the next reporting period.

3.5 Unanticipated Environmental Impacts or Risks

43. During the July–December reporting period, no new major unanticipated environmental impacts were identified; however, several emerging environmental risks were observed that required increased management attention. These risks were primarily associated with recurring oil and fuel spills, hazardous material handling, and construction activities conducted in proximity to sensitive receptors, particularly water bodies. While these issues were largely operational in nature, their repeated occurrence indicates potential for unanticipated impacts if preventative controls are not consistently applied.
44. As highlighted in the Environmental and HSE Trends section, uncontained oil and fuel spills in operational areas posed a latent risk of soil and surface water contamination. Although these spills were generally localized and addressed following intervention, delays in response and cleanup increased the likelihood of secondary environmental impacts, especially during periods of rainfall when contaminants could migrate beyond designated work areas. These conditions represent a deviation from approved environmental management procedures and

could affect compliance with the Environmental and Social Management Plan (ESMP) if not adequately controlled.

45. To mitigate the risk of such unanticipated environmental impacts:
    - The Contractor was instructed to strengthen spill prevention measures and ensure spill kits were readily available and used in all high-risk areas.
    - The Environmental Team increased the frequency of inspections in areas with a history of spills and verified the timely implementation of clean-up actions.
    - Targeted tool-box talks and on-site awareness sessions were conducted to reinforce pollution prevention requirements and correct handling of hazardous substances.
    - Repeated non-compliance was formally addressed through Non-Conformance Reports (NCRs), with the possibility of further enforcement actions if deficiencies persisted.
46. These observations underline the importance of proactive environmental management, particularly the need for effective supervision and early intervention to prevent minor incidents from escalating into unanticipated environmental impacts. Consistent implementation of approved mitigation measures remains critical, especially in environmentally sensitive areas and during high-risk construction activities.
47. The underlying causes of the emerging risks were primarily linked to gaps in day-to-day supervision, inconsistent adherence to established procedures, and insufficient verification prior to and during critical activities. In some instances, coordination between site management and environmental staff was not fully effective, leading to delayed identification and control of potential pollution sources. Workforce awareness regarding the environmental consequences of improper material handling also required reinforcement.
48. While no long-term environmental damage was recorded during the reporting period, the identified risks highlighted the potential for short-term impacts on soil and surface water quality if similar conditions were left unaddressed. Corrective actions, including comprehensive spill clean-up, proper disposal of contaminated materials through licensed hazardous waste contractors, and enhanced monitoring by the Engineer's environmental team, were implemented. These measures aimed to restore full compliance with environmental management requirements, strengthen accountability, and reduce the likelihood of unanticipated environmental impacts during subsequent construction phases.

4 RESULTS OF ENVRIONMENTAL MONITORING

4.1 Overview of Monitoring Conducted during Current Period

49. In March 2023, the CC hired a consultant firm Ltd „Naseto Group" to conduct instrumental environmental monitoring, which includes assessing air and water quality, as well as measuring vibration and noise levels. The findings from this study are detailed in the subsequent sections. The most recent environmental monitoring report is provided as Supplementary Document 3.
50. There were four monthly environmental monitoring conducted during this reporting period.

Surface Water Quality

51. Following the project extension and the corresponding revision of the monitoring schedule, surface water sampling has been conducted on a quarterly basis. As a result, two sampling events were carried out during the reporting period—in July and October 2025. Surface water samples were collected from both upstream and downstream locations along the River Rioni. The geographic coordinates of the sampling points are provided in Table 6, and their locations are illustrated in Figure 3.

Table 6. Surface Water Quality Monitoring Locations

Location	Coordinates	
	X	Y
River Rioni downstream	722788	4674713
River Rioni upstream	723505	4674040

Figure 3. Water Quality Sampling Locations on the Rioni River

52. The results of surface water quality monitoring for the upstream and downstream sections of the River Rioni are presented in Table 7 and Table 8, respectively. During the reporting period, only the July upstream iron (Fe) concentration exceeded national Maximum Allowable Concentration (MAC) limits; this single incident appears to be an isolated anomaly, as such elevated Fe levels have not been previously recorded at the site. In addition, routine monitoring will continue, and if similar results are observed, further corrective actions will be implemented.
53. The Contractor is obligated to ensure full compliance with the Environmental Impact Assessment (EIA) requirements during all construction activities conducted near the Rioni River and the amelioration canal, both of which are vital local water resources. To safeguard these sensitive environments, the Contractor must implement appropriate measures to prevent oil and fuel spills. The discharge of untreated wastewater into these water bodies is strictly prohibited. In addition, erosion control measures must be implemented to prevent sediment-laden runoff from entering the river, thereby preserving the ecological integrity of the surrounding area.

Table 7. Surface Water Quality Monitoring Result for Upstream of River Rioni

Parameters	Unit	EIA Standards (National MAC)	*Baseline results (Apr 2023)*	*Baseline results (May 2023)*	*Jul 2024*	*Oct 2024*	*Jan 2025*	*Apr 2025*	*Jul 2025*	*Oct 2025*
pH	-	6.5-8.5	8.20	7.70	8.28	8.39	8.40	8.03	8.24	8.21
Saltiness	-	-	0.10	0.10	0.10	0.10	0.16	0.15	0.10	0.10
TDS	-	-	106.00	166.30	139.00	121.00	322.40	324.70	136.00	129.00
Electr. Conductivity	-	-	212.00	234.00	244.00	196.00	244.00	225.00	237.00	229.00
Turbidity	-	-	429.00	452.00	127.00	57.60	537.40	381.10	122.00	102.00
Ammonia/ammonium ion NH3	mg/L	0.39	1.81	0.25	0.27	0.29	0.21	0.09	0.25	0.19
Chlorides Cl[1]	mg/L	300.00	647.00	35.90	78.00	86.00	67.30	19.70	76.00	81.00
Weighted particles TSS	mg/L	Increase no more than 0.75 mg/L	212.00	240.20	124.00	116.10	483.66	298.40	139.00	106.00
Total nitrogen N	mg/L	-	8.83	1.53	2.96	3.17	3.02	1.19	2.87	2.72
Total iron Fe	mg/L	0.30	0.05	0.17	0.23	0.26	0.24	0.15	0.41	0.22
Arsenic (total) As	mg/L	0.05	<0.001	<0.001	0.0056	0.0043	0.0038	0.0022	0.0041	0.0039
Total Coliforms	MPN	300.00	-	-	-	-	-	-	-	-

Table 8. Surface Water Quality Monitoring Result for Downstream of River Rioni

Parameters	Unit	EIA Standards (National MAC)	*Baseline results (Apr 2023)*	*Baseline results (May 2023)*	*Jul 2024*	*Sep 2024*	*Jan 2025*	*Apr 2025*	*Jul 2025*	*Oct 2025*
pH	-	6.5-8.5	8.30	7.70	8.23	8.38	8.43	7.94	8.19	8.20
Saltiness	-	-	0.10	0.10	0.10	0.10	0.17	0.16	0.10	0.10
TDS	-	-	107.00	116.80	140.00	122.00	324.70	322.40	129.00	127.00
Electr. Conductivity	-	-	214.00	236.00	246.00	198.00	247.00	228.00	228.00	231.00
Turbidity	-	-	435.00	457.00	129.00	58.10	541.10	387.30	117.00	101.00
Ammonia/ammonium ion NH3	mg/L	0.39	1.70	0.25	0.27	0.29	0.21	0.11	0.24	0.20
Chlorides Cl[2]	mg/L	300.00	640.00	35.00	81.00	86.20	67.80	21.40	73.00	79.00
Weighted particles TSS	mg/L	Increase no more than 0.75 mg/L	210.00	239.80	132.00	116.40	484.27	312.60	119.00	108.00
Total nitrogen N	mg/L	-	8.72	1.52	3.01	3.19	3.03	1.21	2.83	2.76
Total iron Fe	mg/L	0.30	0.05	0.16	0.24	0.27	0.25	0.22	0.29	0.26
Arsenic (total) As	mg/L	0.05	<0.001	<0.001	0.0056	0.0042	0.0038	0.0021	0.0042	0.0040
Total Coliforms	MPN	300.00	-	-	-	-	-	-	-	-

[1] Local meat and fish processing facilities in the vicinity employ chlorine for wastewater treatment

[2] Local meat and fish processing facilities in the vicinity employ chlorine for wastewater treatment

Noise and Vibration Monitoring

54. The Contractor and the Engineer have identified two points for the monitoring of noise and vibration. The coordinates of these monitoring locations are provided in Table 9, and their positions are illustrated in Figure 4.

Table 9. Noise and Vibration Monitoring Locations

Location	Coordinates	
	X	Y
Axis 49	723230	4674705
Axis 17	722690	4674127

Figure 4. Noise, Vibration and Air Quality Sampling Locations

55. Noise monitoring results at Axis 17, as presented in Table 10, exceeded the International Finance Corporation (IFC) noise level standards during the month of August. However, according to the U.S. Federal Highway Administration's Noise Measurement Handbook, indoor noise levels may be reduced by up to 25 dB(A) when windows are closed. It is also noted that the nearest receptor at this location is the Nikora Meat Production factory, which is classified as a less noise-sensitive facility compared to residential areas.
56. Only one elevated noise level was recorded at Axis 17, where the factory is situated. Although the area does not fall within the designated habitat zone, these occurrence still requires

strengthened control measures to ensure compliance with noise regulations and to minimize disturbance to nearby receptors. In response, the Contractor is expected to implement several mitigation measures to reduce noise impacts in this area. These include avoiding the simultaneous operation of multiple high-noise-generating equipment, adjusting work schedules to limit noise exposure during sensitive hours, where necessary, replacing existing machinery with lower-noise alternatives, and the possible relocation of stationary equipment further from sensitive areas.

Table 10. Measured Noise Levels

	Average Equivalent Noise level (LAeq) Measurement dB(A)		
Location/Month	Axis 49	Axis 17	**IFC Standard**
Jul-25	53,4	54,7	**70.0**
Aug-25	76,5	60,8	
Sep-25	69,0	51,2	
Oct-25	52,6	51,7	

57. Vibration monitoring results, as presented in Table 11, indicate that all recorded levels remained below detectable or permissible thresholds.

Table 11. Measured Vibration Levels

Location/Session	**Month**	**Vibration Speed**		**Vibration Acceleration**		***MPC for Vibration Speed (dB)**	***MPC for Vibration acceleration (dB)**
		mm/sc	dB	**mm^2/sc**	dB		
Axis 49	Jul-25	<0.1	<66	<0.1	<100	112	126
	Aug-25	<0.1	<66	<0.1	<100	112	126
	Sep-25	<0.1	<66	<0.1	<100	112	126
	Oct-25	<0.1	<66	<0.1	<100	112	126
Axis 17	Jul-25	<0.1	<66	<0.1	<100	112	126
	Aug-25	<0.1	<66	<0.1	<100	112	126
	Sep-25	<0.1	<66	<0.1	<100	112	126
	Oct-25	<0.1	<66	<0.1	<100	112	126

Air Quality

58. Air quality monitoring will utilize the existing noise and vibration monitoring locations (Figure 4) to assess construction impacts on nearby sensitive receptors (Table 12). These locations will be used for passive SO_x (Sulfur Oxides), NO_x (Nitrogen Oxides), sampling, and dust measurements.

Table 12. Air Quality Monitoring Locations

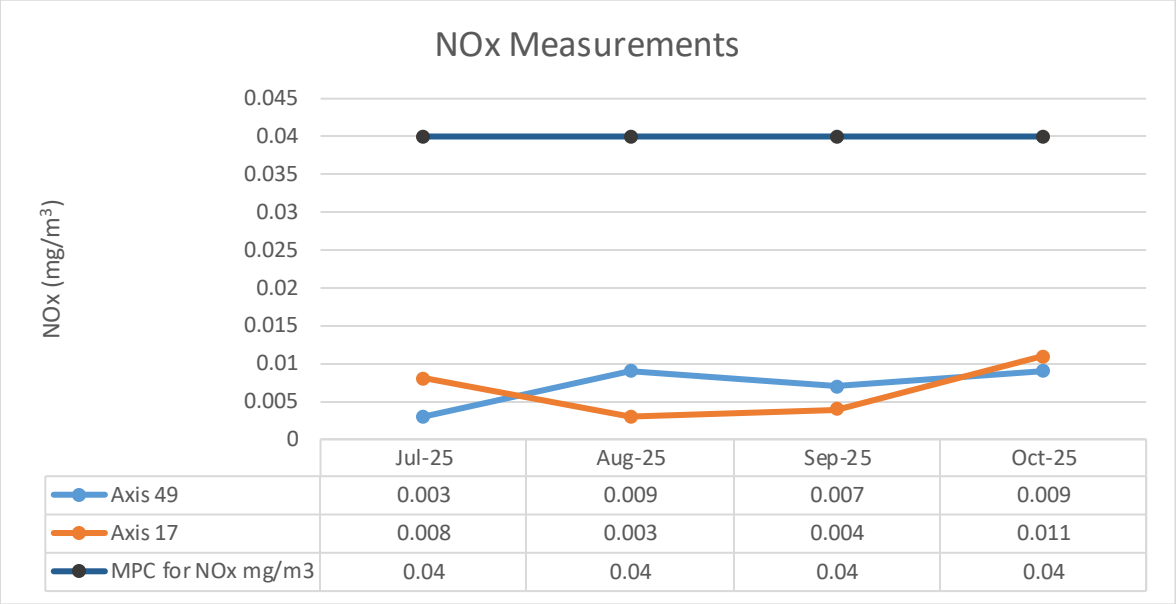
Location	Coordinates	
	X	Y
Axis 49	723230	4674705
Axis 17	722690	4674127

59. Air quality monitoring results for nitrogen oxides (NO_x), sulfur oxides (SO_x), and carbon monoxide (CO) are presented in Table 13, with corresponding visual representations provided in Figures 5, 6, and 7, respectively. Results for particulate matter (PM) are provided in Table 14 and illustrated in Figure 8.
60. The monitoring data indicate that concentrations of SO_x, NO_x, CO, and PM remained within the national air quality standards of Georgia throughout the reporting period.

Table 13. NO_x SO_x CO Measurement Results

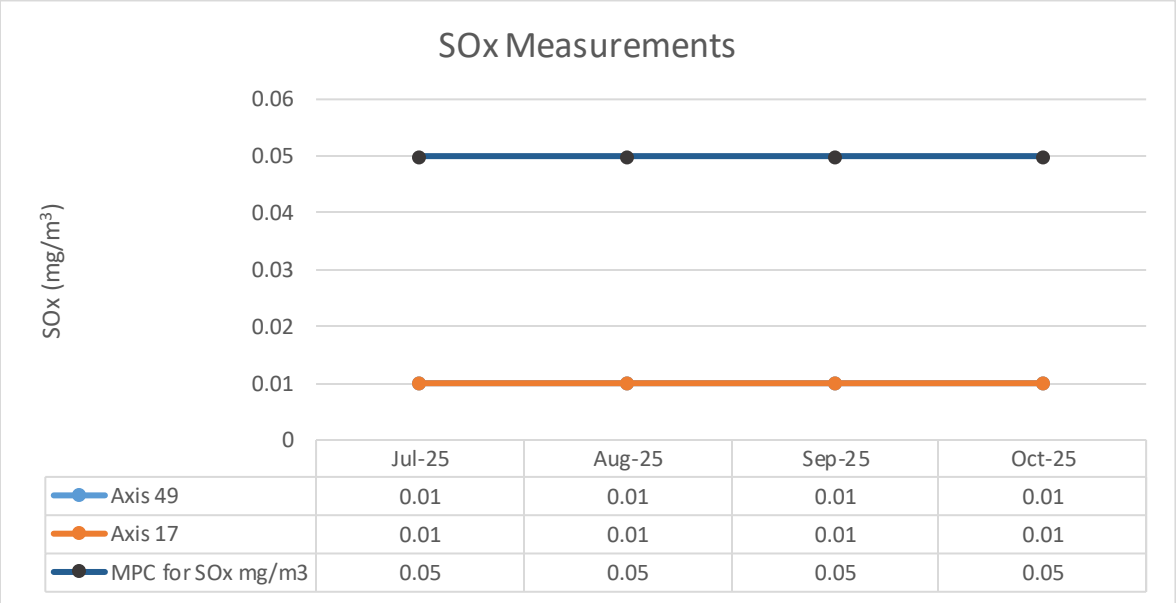
Location	Month	SO_x mg/m³	NO_x mg/m³	CO mg/m³	MPC for SO_x mg/m³	MPC for NO_x mg/m³	MPC for CO mg/m³
Axis 49	Jul-25	<0,01	0,003	0,43	0,05	0,04	-
	Aug-25	<0,01	0,009	0,18	0,05	0,04	-
	Sep-25	<0,01	0,007	0,21	0,05	0,04	-
	Oct-25	<0,01	0,009	0,26	0,05	0,04	-
Axis 17	Jul-25	<0,01	0,008	0,29	0,05	0,04	-
	Aug-25	<0,01	0,003	0,11	0,05	0,04	-
	Sep-25	<0,01	0,004	0,18	0,05	0,04	-
	Oct-25	<0,01	0,011	0,19	0,05	0,04	-

Figure 5. NO_x Measurement Results



	Jul-25	Aug-25	Sep-25	Oct-25
Axis 49	0.003	0.009	0.007	0.009
Axis 17	0.008	0.003	0.004	0.011
MPC for NOx mg/m3	0.04	0.04	0.04	0.04

Figure 6. SO_x Measurement Results



	Jul-25	Aug-25	Sep-25	Oct-25
Axis 49	0.01	0.01	0.01	0.01
Axis 17	0.01	0.01	0.01	0.01
MPC for SOx mg/m3	0.05	0.05	0.05	0.05

Figure 7. CO Measurement Results

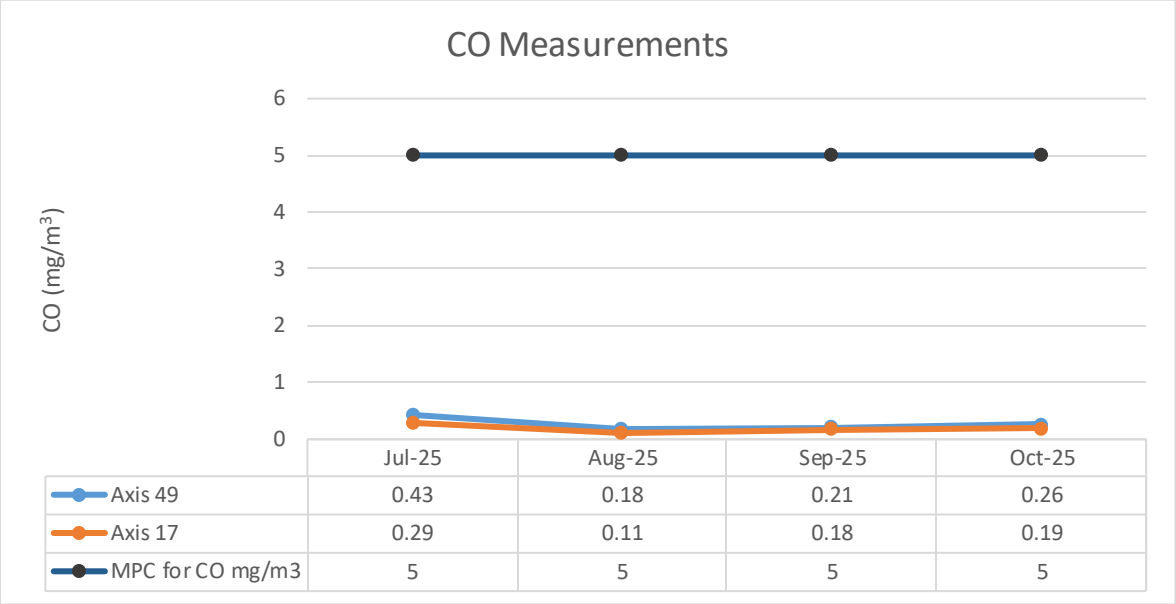
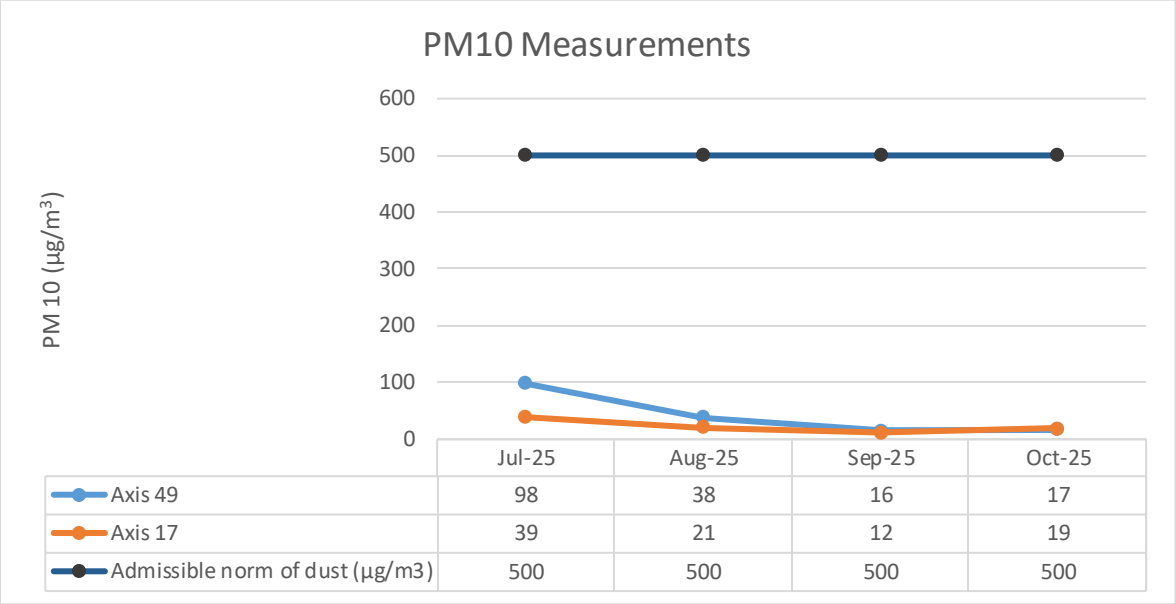


Table 14. PM Measurement Results

Location	Session	PM2.5 (µg/m³)	PM10 (µg/m³)	PM Total (µg/m³)	Admissible norm of dust (µg/m³)
Axis 49	Jan-25	53	77	84	500
	Feb-25	11	19	23	500
	Mar.25	18	22	25	500
	Apr-25	22	37	62	500
	May.25	11	19	31	500
	Jun-25	13	18	22	500
Axis 17	Jan-25	46	62	75	500
	Feb-25	17	24	31	500
	Mar.25	24	29	33	500
	Apr-25	38	57	81	500
	May.25	9	21	37	500
	Jun-25	16	23	39	500

Figure 8. PM10 Measurement Results



61. An ichthyological study focusing on sturgeon species in the Rioni River has been initiated. The Construction Contractor engaged a certified third-party team to carry out the sturgeon survey, which aims to establish a baseline biodiversity assessment—an element not included in the final Environmental Impact Assessment (EIA) but required in accordance with Asian Development Bank (ADB) policy.
62. Under national legislation, fishing activities in the Rioni River are restricted to scientific research and require a permit. The third-party team submitted a permit application to the Ministry of Environmental Protection and Agriculture (MoEPA) on 1 May 2024. The permit was granted in May 2025 and extended in September 2025.
63. Ichthyological survey were carried out on the Rioni River on September 10–11. All relevant stakeholders, including environmental supervisor, monitored the process. Of the 40 fish caught (representing 10 species), none were identified as Red List species. For detailed results, refer to the report in Supplementary Document 5.

4.2 Trends

64. Water, noise, vibration and air quality parameters exhibited consistent results when compared to the previous reporting period. Overall environmental monitoring data followed similar trends.

4.3 Summary of Monitoring Outcomes

65. The CC engaged the consultancy firm Ltd “Naseto Group” in March 2023 to undertake comprehensive instrumental environmental monitoring. This program encompasses the collection and analysis of air quality, surface water quality, noise, and vibration data. The monitoring activities are carried out periodically at pre-identified locations within the project area. These measurements aim to evaluate environmental impacts related to construction activities and to ensure compliance with national environmental standards and international requirements, such as those set by the International Finance Corporation (IFC).
66. The monitoring results during the reporting period reflect general compliance with national and international environmental standards across several parameters, with a few notable exceptions requiring attention and corrective action.

67. **Surface Water Quality**: Surface water samples from the upstream and downstream sections of the Rioni River generally complied with national Maximum Allowable Concentration (MAC) limits. The sole exception was an elevated upstream iron (Fe) concentration in July. This appears to be an isolated anomaly, as such levels have not been previously recorded at the site. These results indicate that water quality remains stable relative to construction activities. However, continued preventive measures—specifically erosion control and spill prevention—are essential to maintaining compliance.

68. **Air Quality**: Monitoring results for nitrogen oxides (NO_x), sulfur oxides (SO_x) particulate matter (PM), and carbon monoxide (CO) consistently remained within national limits throughout the reporting period.

69. **Noise Monitoring**: Noise levels exceeded International Finance Corporation (IFC) thresholds at Axis 17 during August. However, the impact was partially mitigated by the fact that the nearest receptor is a meat processing facility, which is less sensitive than residential areas. To address this, mitigation measures are being implemented, including optimized equipment scheduling and the transition to lower-noise machinery.

70. **Vibration Monitoring**: No exceedances of vibration thresholds were recorded during the reporting period.

71. **Biodiversity Monitoring**:In accordance with ADB requirements, an ichthyological study was conducted to identify sturgeon species. Although the study was delayed by permitting processes, no Red List fish species were identified during the survey.

4.4 Material Resources Utilization

72. The detailed overview of material deliveries to the construction site during the semi-annual period from July to December 2025 is given such as: Gravel shipments totaled 28,7626 m^3, contributing to a cumulative project amount of 221,291 m^3. This period there were 2,780.271 tons of Structural Steel Type S 355 J2W+N. The supply of Prefabricated Vertical Drains totaled 332,150.00 m. Notably, no deliveries of Separation Geotextile or Steel sheet piles, with cumulative amounts maintaining at 32,400 m^2 and 445.55 tones, respectively. The supply of Crushed Aggregate 15-40mm were recorded as 2,898.00 during this period, with cumulative amounts maintaining at 27,746.00 m.

4.5 Waste Management

73. The Contractor has developed a Waste Management Plan outlining the procedures and requirements for the proper handling, storage, and disposal of waste materials. The plan aims to minimize environmental risks by promoting systematic and compliant waste management practices throughout the construction site.
74. To ensure proper waste disposal, the Contractor has established formal agreements with authorized service providers. An agreement has been signed with Black Sea Waste Management for the collection and transportation of hazardous waste. Additionally, a separate agreement with the Khobi Municipality governs the collection and transportation of domestic waste. To improve on-site waste handling, garbage bins have been placed in the camp area and across various construction zones. Furthermore, under a separate arrangement, all replaced materials—such as used tires and oils—are transferred to the Tegeta Motors facility for storage, rather than being kept at the construction site.
75. During the reporting period, the Contractor estimated that approximately 240 m^3 of municipal waste was generated. The site is equipped with two septic tanks, each with a capacity of 8 m^3. A total of 40 m^3 of domestic wastewater was removed through five separate evacuations. Detailed waste management data for the period is provided in Table 15.
76. Following the issuance of the Non-Conformance Report (NCR), all hazardous waste and oil drums were removed from the site via a contract with a specialized disposal firm. Waste Disposal Receipt and photographic evidence of the removal are provided in Supporting Documet 9.

Table 15. Waste Log (July-December 2025)

Domestic/Hazardous Waste & Sewage	Volume /kg/m³	Licensed Company	Transferred
Household waste	240		240
Sewage water	40		40
Used tires	-	Tegeta Motors	Stored in the Company
Hydraulic and used oil	-	Tegeta Motors	Stored in the Company
Waste paints and varnishes	-		Stored in a designated area
Chemical additive tanks	-	-	-
Oil drums	400	-	400
Printer tonner	-	-	-
Absorbents (e.g., oil filters, polluted clothes and materials)	-	-	Stored in a designated area
Medical Waste	-	-	-
Metal Scraps	-	-	Stored in a designated area
Wood Waste	-	-	Stored in a designated area
Contaminated soil	-	-	-

77. The Contractor has signed a contract with Gocha Tsaava, a local individual who will provide appropriate equipment and services for toilet cleaning and sanitation.

4.5.1 Current Period

78. The primary source generating a large amount of spoil is earthworks, specifically the excavation of topsoil and subsoil materials. The excavated materials are stored in a land plot designated for topsoil and spoil with a registration number 45.08.25.076. The estimated volumes for spoil generation in this reporting period are as follows:

- Estimated spoil volume: 0 m³
- Estimated topsoil volume: 0 m³

4.6 Health and Safety

79. The H&S Team is responsible for daily implementation, supervision, and monitoring of on-site construction activities to ensure occupational and community health and safety.

80. No incidents involving community members or traffic incidents were reported during the reporting period.

4.6.1 Worker Safety and Health

81. The Health and Safety (H&S) teams of both the Engineer and the Contractor conduct regular site inspections to monitor compliance with safety protocols. In addition, mandatory H&S and environmental induction training is provided to all newly mobilized personnel. Specialized training sessions are also delivered to reinforce a strong safety culture, covering critical topics such as working at height, driving safety, earthwork activity requirements, and lifting operations. H&S specialists are responsible for preparing training materials, conducting risk assessments for high-risk activities, and developing specific work procedures to address identified hazards.
82. During the reporting period, a total of five (5) Non-Conformance Reports (NCRs) were issued in relation to H&S practices. These NCRs addressed a range of issues including deficiencies such as unsafe conditions for electrical shock, lack of guardrails and solid walkway, improper usage of cutting and clearance equipment without PPE, Improperly installed scaffolding, welding and cutting operation with safety violations, improper storage of oxygen cylinders, and inadequate use of PPE). Supporting documentation and selected examples of the NCRs are provided in Supplementary Document 6.
83. The recurring nature of certain H&S non-conformances particularly those related to lack of guardrails and improper usage of hand tools and PPE usage emphasizes the need for enhanced supervisory oversight and ongoing safety awareness programs.

4.6.2 Training

84. The Contractor continues the training program to foster a culture of responsible behavior encompassing mandatory inductions and job-specific training. Seven training sessions were conducted by the H&S inspectors and eleven training sessions were conducted by Alcotest during this period.

85. During the reporting period, the training program covered the following topics:

- Induction training,
- Tree cutting,
- Tops soil stripping and storage,
- Hazardous non-hazardous waste handling storage,
- Driving safety,
- Lifting operations Refueling process,
- Refueling Process,
- Earthwork activities,

86. Throughout the reporting period, ninety-two (92) toolbox talks were conducted for the employees of both the contractors and subcontractors, addressing the following subjects:

- Suspended loads and lifting;
- Working at height;
- Moving vehicles;
- Usage of power tools (angle grinder, chain saw);
- Fire safety;
- Use of paints and solvents;
- Emergency Evacuation and Fire Extinguisher use
- Excavation;
- Lifting of gas pipes;
- Hazards related to the excavator and controls;
- Handling/storage of fuel;
- The hazards and controls, related to the diesel truck.
- First aider
- Hand signals and safety signs

87. The Contractor conducted Environmental and Social (E&S) training sessions for 15 personnel and Health and Safety (H&S) training sessions for 28 personnel during the reporting period. The training covered a wide range of topics, including basic environmental legislation, waste management, land contamination, spill prevention, dust and air quality management, noise control, resource efficiency, chemical management, community health and safety, grievance redress mechanisms, cultural heritage awareness, code of conduct, concrete handling procedures, emergency preparedness and response, working at height, lifting operations, and incident reporting protocols.
88. Sample attendance sheets and photographic documentation of the E&S and H&S training sessions are provided in Supplementary Document 7.

5 FUNCTIONING OF THE SEMP

5.1 SEMP Review

89. The Contractor has developed Site-Specific and Topic-Specific Environmental Management Plans (EMPs) in accordance with the guidance of the Supervision Consultant. These plans were endorsed by the Supervision Consultant (SC) and approved by the Project Implementation Unit/Roads Department (PIU/RD), and, if necessary, by the Asian Development Bank (ADB), prior to the commencement of civil works. During the preparation of the Site Specific Environmental Management Plans (SSEMPs), the existing EMP serves as a baseline document for the Contractor (Supplementary Document 1). The current status of all environmental plans is summarized in Table 16.

90.

Table 16. Reviewed Site Specific Environmental Management Plans

No	Plan / Method Statement	Status	Approval Date
1	Site Specific Environmental Management Plan	Updated/Waiting for Approval	04.10.2024
2	Environmental Management Plan	Approved	04.10.2024
3	Waste Management Plan (Construction Phase)	Approved with Comments	30.09.2022
4	Emergency Response Plan	Approved	30.09.2022
5	Spill Management Plan	Approved	30.09.2022
6	Wastewater Management Plan	Approved	04.10.2024
7	Chance Find Procedure	Approved	30.09.2022
8	Labor Management Procedures	Approved	20.06.2022
9	Clearance Cultivation Restoration Plan	Approved	30.09.2022
10	Aggregate and Borrow Pit Management Plan	Approved	30.09.2022
11	Asphalt Rock Crushing Batching Plant Management Plan	Approved	30.09.2022
12	Topsoil Disposal and Erosion Management Plan	Approved	30.09.2022
13	Air Quality Management Plan	Approved	30.09.2022
14	Bridge Construction Management Plan	Approved	30.09.2022
15	Laydown Area and Camp Management Plan	Approved	30.09.2022
16	Spoil Disposal Management Plan	Approved	30.09.2022
17	Biodiversity Action Plan	Approved	30.09.2022
18	Tree compensation plan	Approved	04.09.2024

6 GOOD PRACTIVE AND OPPORTUNITY FOR IMPROVEMENT

6.1 Good Practice

91. During the reporting period, the Contractor continued to demonstrate a generally positive level of compliance with environmental management and occupational health and safety requirements, as confirmed through routine inspections and monitoring activities. Environmental monitoring results indicate that air quality parameters, vibration levels, and the majority of surface water quality indicators remained within applicable national standards, reflecting the effectiveness of implemented mitigation measures. In particular, consistent compliance with air quality limits and the absence of vibration exceedances represent good practice in managing construction-related impacts.

6.2 Opportunities for Improvement

92. Notwithstanding the above, several areas requiring improvement were identified during the reporting period in relation to both environmental and H&S performance.
    - Strengthen spill prevention and response measures by ensuring immediate containment and clean-up of oil and fuel spills, particularly in operational areas located near sensitive receptors such as the Rioni River.
    - Reinforce hazardous material handling and storage procedures, including improved housekeeping, clear labeling, and secure containment to prevent secondary environmental impacts.
    - Enhance noise management practices at Axis 17 by fully implementing mitigation measures such as optimized equipment scheduling, avoidance of simultaneous high-noise activities, and consideration of lower-noise equipment alternatives.
    - Ensure consistent installation of guardrails, solid walkways, and physical barriers in elevated and excavation areas to reduce fall and access-related risks.
    - Strengthen enforcement of mandatory PPE usage, supported by increased supervisory presence and routine compliance checks.
    - Improve electrical safety through better cable management, elimination of temporary or scattered connections, and maintenance of clear, up-to-date safety signage across the site.

7 SUMMARY AND RECOMMENDATIONS

7.1 Summary

93. Construction activities during the reporting period included material transportation, piling and concrete works, ongoing earthworks, and associated auxiliary operations. Instrumental environmental monitoring was carried out through four monthly campaigns, covering surface water, air quality, noise, and vibration parameters, with overall results indicating general compliance with national and international standards.
94. Surface water monitoring of the Rioni River demonstrated compliance with national Maximum Allowable Concentration (MAC) limits, with the exception of a single elevated upstream iron (Fe) concentration recorded in July, which appears to be an isolated anomaly.
95. Air quality parameters remained within national limits throughout the reporting period, while vibration monitoring recorded no exceedances. Noise monitoring identified an exceedance of IFC guideline levels at Axis 17 in August; however, the nearest receptor is a non-residential facility, and mitigation measures were initiated to address this issue.
96. Biodiversity monitoring requirements were advanced during the reporting period through the completion of an ichthyological survey on the Rioni River following receipt of the necessary permits. The survey did not identify any Red List species, thereby reducing biodiversity-related risk, while fulfilling ADB policy requirements.
97. Health and Safety teams from both the Engineer and Contractor actively monitor key aspects including working at height, electrical safety, lifting operations, excavation safety, housekeeping, and PPE usage. Despite this, twelve Non-Conformance Reports (NCRs) were issued, primarily related to unsafe working at height, scattered electrical cables, outdated signage, improper oxygen cylinder storage, and inadequate PPE use. These NCRs have been addressed and closed, but recurring issues underscore the need for strengthened supervision and continuous safety training.
98. Health and Safety performance reflected continued monitoring and training efforts by both the Engineer and the Contractor. Five H&S-related Non-Conformance Reports were issued, primarily linked to working at height, electrical safety, scaffolding, PPE usage, and gas cylinder storage. While corrective actions were implemented, the recurrence of similar issues highlights the need for stronger supervisory control and sustained safety awareness initiatives. No community health and safety or traffic-related incidents were reported during the reporting period.

7.2 Recommendations

99. Based on the findings of the reporting period, the following recommendations are proposed for the next reporting period:

- Further strengthen oil and fuel spill prevention and response practices, particularly in areas close to water bodies, to reduce the risk of unanticipated environmental impacts.
- Maintain and enhance erosion control and wastewater management measures to ensure continued protection of surface water quality in the Rioni River.
- Implement all identified noise mitigation measures at Axis 17 and continue close monitoring to ensure compliance with IFC and national noise standards.

- Increase supervisory oversight for high-risk construction activities, with particular emphasis on working at height, scaffolding, and welding operations.
- Enforce strict compliance with PPE requirements through routine checks and disciplinary measures where repeated non-compliance is observed.
- Address electrical safety hazards through improved cable management, regular inspections, and consistent safety signage.
- Continue and expand Environmental, Social, and Health and Safety training programs, tailoring sessions to address recurring non-conformances and site-specific risks.
- Maintain regular environmental monitoring and periodic review of management plans to ensure they remain aligned with current site conditions, regulatory requirements, and lender standards

8 SUPPLEMENTARY DOCUMENT 1 – ENVIRONMENTAL MANAGEMENT PLAN

Environmental Management Plan for Pre-Construction Phase

Affected Aspect	Potential Impact/ Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/ Implementation	Control
Pre-Construction Stage					
No Net Loss / Net Gain Approach	Impacts on sturgeon species in the Rioni River	• Measure to achieve no net loss / net gains: Implement high standard monitoring program for sturgeon.	Project Cost	RD, ADB	N/A
EMP contractual obligations	Implementation of Project EMP and Specific Environmental Management Plan (SEMP)	• Before the commencement of civil works, the Contractor shall prepare a Specific EMP (SEMP) for Engineer endorsement and RD approval. ADB shall also review the SEMP. The SEMP will present a detailed implementation plan based on the Contractor's actual construction methodologies, work schedule, type/specifications, and number of construction plants to be used • The SEMP shall be (a) consistent with the SEMP template included in the EIA (see), (b) consistent with the project EMP, and (c) prepared based on the Contractor's activities and corresponding locations. • The SEMP will provide the following: i. The Contractor's organizational structure shows the implementation, supervision and reporting, and responsibilities of key personnel ii. The Project program and work activities iii. The Contractor's topic and site-specific plans are as follows: ○ Waste Management Plan ▪ Wastewater Management Plan ▪ Spoil Disposal Management Plan ○ Soil Erosion Management Plan ○ Traffic Management Plan ○ Method Statement for Temporary Roads ○ Aggregate and Borrow Pits Management Plan ○ Employment and Procurement Procedure ○ Occupational and Community Health and Safety Management Plan ○ Emergency Response Plan ○ Waterway Safety Plan ○ Method Statement for River Crossings ○ Air Quality Plan ○ Spill Management Plan ○ Clearance, Revegetation, and Restoration Management Plan ○ Noise Management Plan ○ Biodiversity Management Plan ○ Laydown Area and Construction Camp Management Plan ○ Asphalt, Rock Crushing, and Concrete Batching Plant Management Plans ○ Bridge Construction Plan • The Occupational and Community Health and Safety Management Plan shall be consistent with the template provided in the EIA. • The Soil Disposal Management Plan shall utilize the assessment template included in the EIA. • The Contractor will retain the expertise of a qualified Environment and Social Officer (ESO) and Community Liaison Officer (CLO). • The Contractor will obtain all necessary permits and approvals before commencing construction activities.	Contractor Cost	Contractor to Implement Mitigation	Engineer, RD, ADB
Training	The Contractor's training and awareness-raising programs	• All personnel shall undergo a Project site induction that includes the Project's environmental requirements.	Contractor Cost	Contractor to Implement Mitigation	RD, ADB

Climate Change	Future climate changes may cause damage to the bridge and approach roads	• The Project Road will be constructed based on an embankment height (road centerline level) which accommodates the historic P1% (1 in 100 years) flood event. • Further climate change studies must be carried out as necessary to ensure that climate change considerations have been incorporated in the design of the bridge and approach roads.	Project Cost	Detailed Design Consultant	RD
Noise/Vibration	Vibration emissions resulting from the use of machinery and equipment and vehicle circulation	• The Contractor will survey the status of the buildings nearest to the project site. The surveys will cover the following aspects: ○ Overall condition of the structures, both exterior ○ and interior. ○ Document defects and preexisting cracks observed in the structure using digital imagery, notes, measurements, and sketches. ○ The survey findings shall be agreed upon by the property owner, who shall attend the survey and sign official documentation agreeing to the survey findings. • Conduct additional pre-construction noise surveys to confirm site conditions. Incorporate findings of such investigations in the updated EIA and EMP if necessary.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Flora and Fauna Habitat, Distribution, and Species	Rehabilitation of the secondary road from Patara Poti to the oil terminal may extend into a proposed extension of the National Park (close to where the gas line crosses the Rioni River).	• Consult with the MoEPA to determine the extent of the proposed extension of the National Park (currently being considered by parliament), which will cover the Rioni River and may extend as far east as the railway bridge neighboring the Project. • Ensure that the rehabilitation of the secondary road does not extend into the proposed extension of the National Park.	Project Cost	Detailed Design Consultant	RD
	Cumulative impacts from the multiple developments in the region.	• The Consultation will be taken with IFI's, donors, and implementing units on other projects that are likely to contribute to cumulative impacts to reduce uncertainty and, where necessary, take appropriate action to minimize environmental harm.	Project Cost	RD	N/A
Aquatic Fauna Habitat, Distribution, and Species	Modification and fragmentation of habitat, including loss of spawning grounds for wild sturgeon species	• Ensure that all guidance on sand and gravel abstraction sites is followed as outlined in the ***Site Preparation, Construction, and Worksite Closure (i.e., project closure) Phases*** EMP table below are followed.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
	Displacement of species due to noise, presence of machinery, and equipment and of staff	• Before starting any in-the-water construction activities, conduct underwater noise measurements using hydrophones to establish in the water background noise levels. • The Contractor shall predict planned impact pile-driving noise levels in the water utilizing interim good practice guidelines before starting to pile. Where planned impact pile-driving appears likely to exceed Project thresholds, alternative pile-driving methods or mitigation will be selected.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
	Mortality of individuals from the operation of equipment and construction activities	• The Contractor will ensure that in-river construction activities are staged in periods least likely to affect the sturgeon fish spawning period. • All in-river activities will be avoided from March to September inclusive. Where possible, in-river activities will also be avoided in October and November.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
	Mortality of sturgeon from illegal fishing activities using the bridge structures.	• Institutional arrangements will be decided for monitoring the bridge piers by CCTV throughout the operation period to prevent poaching of the sturgeon by using fishing gear on bridge structures.	Project Cost	RD	ADB

Flora species	Mortality of individuals	• The Contractor shall survey construction to identify natural and modified habitats to ensure that natural habitats can be rehabilitated and compensated for where they will be permanently lost. • The Contractor shall identify through a site survey if any Georgian Red-listed tree species are located within five meters of the site boundary. This survey will form part of the Contractor's Clearance, Revegetation, and Restoration Management Plan. In addition, in case walkover surveys pre-construction reveal any protected plant species in the area, the latter will be removed from the environment [and translocated] following subparagraph (v), Article 24, the first paragraph of the law of Georgia on 'Red List and Red Book.' • Relocation of any specimens found during the surveys, where practical, will be provided with the help of biodiversity experts to ensure proper handling. Proper handling is crucial for species of conservation importance (e.g., Colchis Water-Chestnut (*Trapa colchica*) and spring snowflake (*Leucojum vernum*)). The practice will provide the best possible chance of survival for wildlife. The Contractor must develop a plan and schedule before implementing this task.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Change of Land Use and Livelihoods	Land acquisition and livelihood loss to affected persons	• Before the commencement of the construction works of the Project, the RD must finalize and implement the Land Acquisition and Resettlement Plan (the LARP) designed in compliance with the ADB Safeguards Policy Statement 2009.	LARP Cost / Project Cost	RD to finalize the LARP and implement the Plan.	ADB to approve the LARP
	Barrier effect (impacts on mobility and access of locals to areas such as farmlands, aquaculture ponds, etc., across the Project road)	• Ensure designs retain a strip of riparian habitat along the edge of the river to reduce the impact on species (keep connectivity and possibility for free movement along the river edge).	Project Cost	Detailed Design Consultant	RD
Services Demand	The disruption of services, including energy, to surrounding communities due to the relocation of utilities.	• All telephone and electrical poles/wires and underground cables should be shifted before the start of construction. • Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services. • Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services, if any.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Grievance Redress	Complaints due to project implementation	• Before the commencement of site works, the Contractor will develop a grievance redress mechanism (GRM) or system that will allow for receiving/recording and immediate response to and resolution of construction-related complaints. The GRM shall be consistent with the GRM described in this EIA. • The Contractor will inform the communities along the alignment and other stakeholders affected by the Project about the GRM in place to handle complaints and concerns about the Project. • The Contractor will also install notice boards at the construction sites to publicize the name and telephone numbers of the representatives of the Contractor and the RD.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Environmental Management Plan - for Site Preparation, Construction, and Worksite Closure Phases

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/ Implementation	Control
Site Preparation, Construction, and Worksite Closure (i.e., project closure) Phases					
Air Quality	Localized dust emissions resulted from the use of machinery and equipment and the circulation of vehicles.	• Dust-generating areas will be controlled by water spraying, particularly under dry weather conditions. • Stockpiles will be planned and sited to minimize the potential for dust generation by taking into account prevailing wind directions and the locations of sensitive receptors. • The drop height of potentially dust-generating materials will be kept as low as possible. • Where practicable, stockpiles will be located away from sensitive receptors. • If the crushing of construction materials is required, crushers will be located away from sensitive receptors. Keeping at least a 300 m distance from residences windward to concrete production plants should be ensured. • The Contractor will obtain an environmental impact permit for an asphalt plant (if planned to run its facility) before operation. • Onsite speed limits will be applied and enforced for trucks traveling on unpaved surfaces (20 km/h). • Trucks transporting spoil or dusty materials off-site will be covered before leaving the sites. • Wheel-washing facilities will be available and used so that trucks leaving the Site do not spread dust onto neighboring roads. • Public roads used by site traffic will be swept regularly to prevent the accumulation of dirt. • Conveyor belts (e.g., at batching plants and rock-crushing plants) shall be fitted with wind-boards, and conveyor transfer points and hopper discharge areas shall be enclosed to minimize dust emission.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
	Localized and long-term combustion gas emissions result from the use of machinery and equipment and the circulation of vehicles.	• Machines and construction plant items (e.g., trucks) in intermittent use will be shut down or throttled between work periods. • The burning of waste or vegetation on Site is prohibited. • Special attention will be given to the storage and handling of petrochemicals to avoid environmental hazards and risks. • Maintenance procedures will be implemented to keep equipment in good working condition to minimize exhaust emissions caused by poor performance. • Wherever possible, use electrically-powered equipment rather than gas or diesel-powered equipment. • Training will be provided for the operators of equipment and truck drivers regarding the air pollution potential of their activities.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Noise	Noise and vibration emissions resulting from the use of machinery and equipment and vehicle circulation	• Work hours will be restricted between 07:00 to 20:00 hours within 500 m of the settlements. • The Contractor will establish the optimum travel speed during off-site travel. • Install temporary noise barriers made of plywood or acoustical blankets around noisy operations where necessary to comply with project noise limits. • Use newer equipment with improved noise muffling and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators, intact and operational. Newer equipment will generally be quieter in operation than older equipment. All construction equipment should be inspected at periodic intervals to ensure proper maintenance and the presence of noise control devices (e.g., mufflers and shrouding, etc.). • The number of equipment operating simultaneously will be reduced as far as practicable. • Reduce the number of equipment operating simultaneously as far as practicable. • Orientate equipment is known to emit noise strongly in one direction so that the noise is directed away from receptors as far as practicable. • Locate noisy plants as far away from receptors as practicable.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/ Implementation	Control
		• Avoid transportation of materials on- and off-site through existing community areas during nighttime hours. • Use material stockpiles and other structures to screen noise-sensitive receptors from onsite construction activities where practicable. • Record and respond to complaints according to the established grievance redress mechanism. • Keep nearby residences informed in advance about noisy activities during various construction phases. • Perform independent periodic noise and vibration monitoring to demonstrate compliance with Project noise and vibration limits. • When there is a possibility of human annoyance from construction activities, conduct such activity only during weekday daytime hours when the ambient background noise and the vibration are higher, and many residents are away from their homes at work.			
Soil Quality	Land pollution due to improper management of solid waste, as well as possible dripping of hydrocarbons from machinery and equipment, and improper storage of oil and fuel.	• Temporary fuel tanks will be located at least 50 m from any watercourse, drain, or channel leading to a water course. The tank will be placed in covered areas with berms or dikes installed to intercept any spills. Any fall will be immediately localized and cleaned up with absorbent materials. The bund will be able to accommodate 110% of the volume of the tank. • Onsite repairs /maintenance and fueling activities will be limited to the extent possible. • Onsite vehicles and equipment shall be inspected regularly for leaks, and all leaks shall be immediately repaired. Leaking vehicles/equipment will not be allowed onsite. • Secondary containment devices (drop cloths, drain pans) shall be used to catch leaks or spills while removing or changing oils from vehicles or equipment. For minor spills, absorbent materials will be used. • Tire washing units will be equipped with drainage settling facilities. The washout pit will be cleaned immediately upon 75% filling. • No washing of vehicles in the river will be allowed. • Usage of off-site vehicle wash racks or commercial washing facilities will be used whenever feasible. In addition, bermed wash areas for cleaning activities will be established if onsite cleaning is required. • The Contractor will implement a training program to familiarize staff with emergency procedures and practices related to contamination events. Operating personnel will be trained to visually inspect discharged water quality for oil and grease traces (that will be visible on the surface) periodically and take appropriate corrective actions.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Soil Structure	Land erosion due to loss of vegetation coverage and changes in its structure	• Materials and waste will be stockpiled so as to avoid erosion (in stockpiles less than 2 m in height and with a slope gradient of less than 25%) and washing off into the river. In addition, drainage trenches will be established to divert surface runoff from the Site. • Under no circumstances shall the following habitats be used for spoil disposal sites: (i) Kolkheti National Park and the Wetlands of Central Kolkheti Ramsar Site; (ii) Kolheti Important Bird Area; (iii) low grass marsh areas; and (iv) within 50 meters of the Rioni River. • To avoid loss of the productive soil layer, all suitable topsoil and other material shall be saved and stockpiled separately for the future recultivation of the area. • Stockpiles of removed topsoil will be designed appropriately/shaped, and managed. • Sand and aggregates will be stored in a hopper or bunker, shielding materials from winds. The bunker should enclose the stockpile on three sides. The walls should extend one meter above the height of the maximum quantity of raw material kept on Site and two meters above the front of the stockpile. The hopper or bunker will be fitted with water sprays that dampen the stored material. • Store cement in sealed, dust-tight storage silos. All hatches, inspection points, and ductwork will be dust-tight.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/ Implementation	Control
		• Temporary detention ponds or containment to control silt runoff will be provided. • Construct intercepting ditches and drains to prevent runoff from entering construction sites • Soil compaction may be reduced by strictly keeping to temporary road boundaries. • Slopes of the embankment will be protected from erosion by vegetation and slope drainage. The design considers the selection of a reasonable embankment height, establishing temporary berms, slope drains, temporary pipes, contour ditches, ditch checks, diversions, and sediment traps. • Disturbed vegetation must be replanted immediately after the construction/disturbance stops. • Appropriately set up temporary construction camps (if determined needed) and storage areas to minimize the land area required and impact soil erosion.			
Relief	Modification of geological formations - Quarries	• The Contractor will carry out the operation of quarries and borrow pits, as well as extraction of gravel from river terraces (if utilized), in strict accordance with the conditions of a license issued by the Ministry of Economic Development (MoED) and cleared by the Ministry of Environment Protection and Agriculture (MoEPA); and • The Contractor will be responsible for developing, agreeing, and strictly adhering to the quarry/borrow pit operation and re-cultivation plan (if the Contractor owns or establishes a new quarry site). • Borrowing from the river [at the Project site] will be prohibited. • Sourcing construction materials (e.g., sand, gravel) will avoid using licensed or unlicensed sites in the Rioni River or on its banks. • Borrow areas for materials, other than dredged sand fill, shall not be located in productive land, forested areas, and near water courses such as rivers, streams, etc.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Water Quality	Pollution of nearby water bodies due to poor storage and management of construction materials	• Discharge of any untreated water into the surface water body will be strictly prohibited. • Discharge of cement /concrete contaminated water will be prohibited unless settled and neutralized first to avoid pollution from water with high alkalinity, which can be toxic to aquatic life. • To prevent runoff contamination, paving will be performed only in dry weather. • Compacted straw (straw bales), silt fences, fibber rolls, gravel bags, or other approved sediment control must be ensured in disturbed soil areas. At a minimum, all bare soil (whether it's an abutment slope or a stockpile) must be protected before it rains. • Drainage systems, erosion control, and silt removal facilities will be regularly inspected and maintained to ensure proper and efficient operation. • Vegetation will be preserved where feasible, particularly in areas near the river bank, to avoid erosion/sedimentation. Sites will be promptly revegetated where practicable and appropriate. • The construction camp (if needed), permanent or temporary, will not be located within 500 m of any river or irrigation channel. • Wastewater Management Plan and proper sewage collection and disposal system will be available to prevent pollution of watercourses (if discharge in the surface water is planned). • Stormwater drainage and wastewater will be treated according to the applicable World Bank/IFC guidelines. • Where applicable (i.e., to the irrigation canal in Patara Poti), the Project will, as much as possible, control the effluent and runoff discharged to the irrigation channel to below the "Severe" restriction on use according to the FAO Guidelines for Interpretations of Water Quality for Irrigation.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
	Impact on surface water contamination from inappropriate	• Construction materials and wastes will be stored appropriately to minimize the potential damage or contamination of the materials. • A construction materials inventory management system will be implemented to minimize the over-supply of construction materials, which may lead to the disposal	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/ Implementation	Control
	waste management	of surplus materials at the end of the construction period. • Hazardous and non-hazardous waste will be segregated, and appropriate containers for the type of waste will be provided. • Waste will be stored systematically to allow inspection between containers to monitor leaks or spills. • Waste will be disposed of systematically by licensed contractors. • Stormwater drainage and wastewater will be treated according to the applicable World Bank/IFC guidelines.			
	Impacts on surface water due to contamination from accidental releases of hazardous substances	• Implementation of the specific mitigation measures outlined under Contamination of Soils above.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
	Water pollution from bridge construction	• Coffer dams, silt fences, sediment barriers, or other devices to prevent the migration of silt during construction within the river will be provided. • Dewatering and cleaning cofferdams to prevent siltation by pumping from cofferdams to a settling basin or a containment unit will be performed. • Ensure no waste materials are dumped in the river, including reinforced concrete debris. • Generators will be placed more than 20 m from the river. • No concrete waste from concrete mixers will be dumped in the river. • Areas where concrete mixers can wash out leftover concrete without polluting the environment, will be provided. This may be in the form of a lined settling pond. The Contractor will inform drivers of these locations and the requirements to use these settling ponds on a routine basis. • Dried waste from the settling ponds can be used as backfill for culverts, etc. (as long as not contaminated).	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
	Surface water contamination from accidentally spilled fuel/oil and road surface runoff.	• Construction of two retention chambers (one on each side of the bridge) to protect water quality from contaminated roadway surface runoff and in the event hazardous substances are accidentally spilled during the operation phase. • Development of detailed terms of reference on the maintenance requirements for the retention chambers based on a final design and technical specifications. The TOR should include the following information with regards to maintenance and servicing of the retention chambers: (i) timing and frequency; (ii) training requirements; (iii) necessary equipment; (iv) procedures; and (v) locations where contents of the chambers can be treated/processed.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Vegetative Coverage	Loss of vegetation coverage in specific areas of the Project	• Delimitation of areas to be cleared will be made before the beginning of the construction activities to limit as much as possible the surface of vegetation to be removed. • Boundaries of ROW and operation area will be strictly kept to - avoid impact on the adjacent vegetation; Strict keeping to traffic routes during the construction will be ensured to prevent impact on vegetation. • The planned clearance area for the construction works shall be identified and marked to avoid accidental clearing. • Fencing of critical root zones of the trees at the boundary with the project area or on the way will be carried out. • The Project will utilize or upgrade existing roads to minimize unnecessary clearing requirements. • Training the staff in environmental and safety issues, including the protection of vegetation outside the boundaries of the project corridor. • Care will be taken to avoid the introduction of new invasive species to, and spread of existing invasive species within, the Project area through the washing of vehicles, equipment, and supplies before entry to the	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/ Implementation	Control
		Project area; monitoring for invasive species; and control/eradication of invasive species where found. • Implement Clearance, Revegetation, and Restoration Management Plan. • Dispersion of fine dust and aerosol will be limited to the narrowest area possible through protective revegetation activities on both sides of the road. • All efforts will be made to minimize the removal of mature/significant trees and maintain connectivity between areas of forest habitats.			
	Planting of vegetation on the Site after rehabilitating disturbed areas	• Disturbed sites will be recultivated after the completion of work. • Any reseeding or replanting of selected areas to be restored will use locally collected seed mixes and saplings. • A local source of indigenous saplings suitable for replanting programs will be identified to facilitate restoration. • The Clearance, Revegetation, and Restoration Management Plan prepared before construction will be followed (see section. • No net loss of natural habitat will be ensured based on the site survey conducted during the Pre-Construction Stage.	Contractor Cost	Contractor to Implement Mitigation	Engineer to Monitor Success Rate (RD to determine success rate criteria)
	Tree cutting	• Plant maintenance will be carried out for at least two years. • The Contractor shall be responsible for replanting any trees cut in these areas on a 1:3 basis using species native to the Site.	Contractor Cost	Contractor and RD to Implement Mitigation	RD, Engineer
Terrestrial and Aquatic Fauna Habitat	Modification, fragmentation, and degradation of habitat	• Air, water, soil, and noise impact mitigation measures will be implemented. • Waste management – regular cleanup of the areas and management of waste according to the type and category. • Refueling all plants, vehicles, and machinery will not be allowed within 50 m of any watercourse, drain, or channel leading to a water course. • Construction materials and chemicals will be appropriately secured during flood season to avoid accidental release into the natural environment. • Oil, chemical, and solid waste will be stored, handled, and disposed of by appropriately licensed waste management contractors. • Dropping structures into rivers/streams will be avoided [construction will instead take place from the river bank or pontoons]. • Construction camp waste areas will be managed appropriately, so animals are not attracted that could be injured or ingest inappropriate food.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
	Introduction of invasive alien species	• Care will be taken to avoid the introduction of new invasive species to, and spread of existing invasive species within, the Project area through the washing of vehicles, equipment, and supplies before entry to the Project area; monitoring for invasive species; and control/eradication of invasive species where found.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Terrestrial Fauna Species	Fauna mortality	• Speed limits to a maximum of 20 km/hr for construction vehicles will be enforced to minimize the potential for fauna strike. • Commitment will be made to raise awareness of the values of natural habitat areas to the construction workforce, and arrangements will be made to restrict poaching and forest product collection. • Hunting wild animals will be strictly prohibited to apply for all staff. • Excavations left open at night will be covered. • Any excavations will include slopes or boards to ensure species can self-rescue should they fall in. • Leaving water-filled excavations will be avoided. • Where possible, vegetation will be removed outside the core breeding season from spring to early summer to allow species to find alternative breeding sites or to disperse after breeding.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Terrestrial Fauna Distribution	Displacement of species due to noise, machinery and	• Adherence to the no-horn policy will be enforced. • All vehicles, equipment, and machinery used for construction will be regularly maintained and	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/ Implementation	Control
	equipment, and staff presence.	inspected/certificated to ensure that the noise levels conform to the standards prescribed. • Works will not be lit except in exceptional circumstances or required for safety reasons. • If lights are installed on the road or bridge in the future, ensure that lower-wattage lamps are used in street lights which direct light downwards to reduce glare.			
Aquatic Fauna Distribution	Displacement of species due to noise, presence of machinery, equipment, and of staff.	• Movement of machines inside rivers, streams, or on their banks will be prevented except when it is unavoidable due to the construction of a structure. • All in-river activities will be avoided during March-September inclusive to prevent disturbance to sturgeon during their overall spawning season. • The central bridge pier and adjoining two piers will be constructed (referring specifically to construction using coffer dams in the river) at two different times. • Implement a build-up of activity that slowly increases construction activities within the Rioni River to allow aquatic fauna to exhibit avoidance responses.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Aquatic Fauna Species	Mortality of individuals, from the operation of equipment and construction activities or poaching by construction workers.	• The use of propeller-driven boats will be minimized during construction. • Warning signs and CCTV cameras will be installed on both sides of the bridge to deter and detect illegal fishing activities. • Poaching animals will be strictly prohibited to apply for all staff. • Fishing and use of illegal fishing gear anywhere along the river will be prohibited.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
	Cumulative impacts from the multiple developments in the region.	• The Consultation will be taken with IFI's, donors, and implementing units on other projects that are likely to contribute to cumulative impacts to reduce uncertainty and, where necessary, take appropriate action to minimize environmental harm.	Project Cost	Contractor to Implement Mitigation	RD, Engineer
	Pile driving for in-river construction	• Noise from pile-driving will be kept below current international interim good practice guidelines. • Ensure compliance with construction specifications that envisage the arrangement of cofferdams to protect water quality during construction and minimize the impacts on aquatic fauna during pile driving in the Rioni River. In addition, noise from pile driving will be kept below current international interim good practice guidelines. • The Contractor will model planned pile-driving and assess alignment with international interim good practice guidelines *before* starting to pile.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Landscape Quality	Change to existing landscape and character	• Implementation of mitigation measures defined for soil, vegetation, and waste management. • The visual impact of construction works will be mitigated by keeping to the boundaries of the worksites and traffic routes; preservation of vegetation; cleanup and good management of construction sites and camps; timely removal of waste from the area; material stock control (to avoid the accumulation of surplus material on the Site) • An approved recultivation plan will be implemented. • After completion of works, the worksite will be cleaned up; surplus materials, temporary structures, and machinery will be removed. • Site compounds within the landform will be carefully placed. • Existing woodland, land features, and other key elements will be retained and protected within the proposed development corridor. • Commitment to high-quality design, materials, and specifications for the road and Rioni crossing.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Change of Land Use and Livelihoods	Land acquisition and livelihood loss to affected persons	• Impacts of physical and economic displacement will be addressed through the resettlement plans designed in compliance with the ADB Safeguards Policy Statement 2009. • Written agreements with local landowners for temporary use of the property will be required, and sites must be restored to a level acceptable to the owner within a predetermined time period.	Project Cost	RD to Implement the Plan / Corrective Action Plan	ADB to Approve the LARP / Corrective Action Plan
Jobs	Impacts on employment and economy	• An Employment and Procurement Procedure should be established. In addition, the plan's development should involve Consultation with relevant stakeholders, including government authorities and local villagers.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

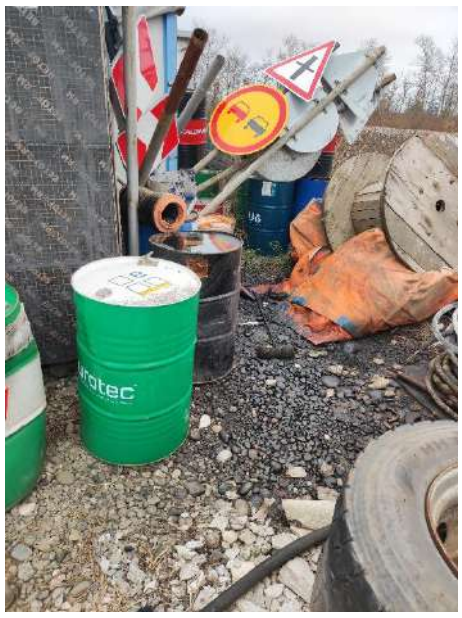
Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/ Implementation	Control
		• Opportunities to establish a skills training program with the aim of training interested local villagers to contribute to the Project should be reviewed. • Local villagers should be informed of job opportunities promptly. • Local businesses should be informed of contracting opportunities on time.			
Services Demand	Impacts on community infrastructure and services	• Traffic advisory signs (to minimize traffic build-up) will be posted in coordination with local authorities. • Accidentally damaged private property and/or infrastructure should be promptly restored. • The community will be kept informed about the schedule of works which could cause temporary restriction of services and the potential duration of the 'impact' in advance.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Community Health and Safety	Impacts on social cohesion	• Construction camps (if established) will be located away from communities to avoid social conflict in competition for resources and basic amenities such as water supply. • Local residents should be given priority in the hiring of construction workers. • Employment of women will be encouraged. • Goods and services will be sourced from local commercial enterprises to the extent possible.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
	Risks to community health and safety due to increased traffic; the transport, storage, and use and/or disposal of materials (e.g., fuel and chemicals); and access to structural elements or components of the Project by members of the community.	• Air, water, soil, waste, and noise impact mitigation measures will be implemented. • The Contractor shall provide appropriate safety barriers with hazard warning signs attached around all exposed openings and excavations. • Noise, vibration, and emission impact mitigation measures will be implemented. • Signs advising road users that construction is in progress will be provided, specifically at the points where the new road connects with the E-60. • Flag persons will control traffic when construction equipment enters or leaves the work area. • Strictly impose speed limits on construction vehicles along residential areas and where other sensitive receptors such as schools, hospitals, and other populated places are located.	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Occupational Health and Safety	Workers' exposure to various physical hazards may result in minor, disabling, catastrophic, or fatal injuries.	• Measures will be implemented to reduce the likelihood and consequence of the potential hazards. This shall include (but not be limited to) the following risks: ○ Falling from height; ○ Falling into the water; ○ Entanglement with machinery; ○ Tripping over permanent obstacles or temporary obstructions; ○ Slipping on greasy walkways; ○ Falling objects; ○ Contact with dangerous substances; ○ Electric shock; ○ Variable weather conditions; ○ Lifting excessive weights; and ○ Traffic operations. • Conduct orientation for construction workers regarding health and safety measures, emergency response in case of accidents, fire, etc., and prevention of HIV/AIDS and other related diseases. • Competent and adequately resourced Subcontractors will be used where construction activities are to be subcontracted. • Provisions will be incorporated into all sub-contracts to ensure compliance with the SEMP at all tiers of the sub-contracting. • All persons working on the Site will be provided information about risks on the Site, and arrangements will be made for workers to discuss health and safety with the Contractor. • The Contractor will prepare and implement an Occupational and Community Health and Safety Management Plan before commencing work. This plan will include provisions on clean water, sewage and wastewater, solid waste, liquid chemical waste, personal protection, emergency preparedness and	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/ Implementation	Control
		response, records management, safety communication, and training and awareness. • All workers will be adequately informed, consulted, and trained on health and safety issues. • The areas where the risk of injuries from falling objects exists will be marked with rope or flagging to minimize risks and damages. • Flag persons will control traffic when construction equipment enters or leaves the work area. • The approved traffic management plan Error! Reference source not found.will provide road signs. • Personal Protective Equipment (PPE) shall be worn at all times on the Site. This shall include appropriate safety shoes, safety eyewear, and hard hats. In addition, Non-slip or studded boots will be worn to minimize the risk of slips. • Before starting work, all the appropriate safety equipment and first-aid kits will be assembled and checked as being in working order. • All lifting equipment and cranes will be tested and inspected regularly. • All scaffolding will be erected and inspected, and the Contractor will maintain the appropriate records. • When there is a risk of drowning, lifebelts shall be provided, and it shall be ensured that personnel wears adequate buoyancy equipment or harness and safety lines and that rescue personnel is present when work is proceeding. • All safety harnesses, lifelines, reviving apparatus, and any other equipment provided for use in or in connection with emergencies will be adequately maintained and thoroughly examined at least once a month and after every occasion on which it has been used. • Drivers will be educated on safe driving practices to minimize accidents and prevent the spill of hazardous substances and other construction materials during transport. • Adequate sanitation facilities will be provided for all workers at the workers'/construction camps. • First aid facilities will be provided that are readily accessible to workers. • Fire-fighting equipment will be provided at the work areas, as appropriate, and at construction camps where fire hazards and risks are present. • Report all accidents and near misses and collect statistics to identify trends and requirements for further training or 'safety stand-downs' where incident numbers are growing.			
Cultural Heritage	Risks to built heritage, objects, and sites with archaeological, historical, religious, or other cultural value and significance.	• The chance finds procedure for managing cultural heritage will be implemented if any cultural heritage is discovered during construction.	Contractor Cost	Contractor and RD to implement mitigation	RD, Engineer
Grievance Redress	Complaints due to Project implementation	• The Contractor will be responsible for nominating a Community Liaison Officer (CLO) and implementing the grievance procedure. • Workers will not be restricted from joining or forming workers' organizations or from bargaining collectively. The Contractor will not discriminate or retaliate against workers who create or join collectives or bargain collectively. • Working relationships and work conditions are also to be managed and monitored in implementing the Project. • Continuous monitoring and review of complaints from neighboring communities around the Project activity areas per the grievance redress mechanism.	Contractor Cost	Contractor and RD to implement mitigation	RD, Engineer
Waste	Pollution of land, water, or air from poor waste management	• The Contractor will classify waste streams (hazardous, non-hazardous, or a waste that requires a full assessment to determine classification – so-called	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/ Implementation	Control
		'mirror entry' waste) and manage them according to international best practice and Georgian law. • Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters and are connected to septic tanks or wastewater treatment facilities. • The Contractor will agree with Poti municipality, and solid non-hazardous, and inert waste will be removed to the Poti municipal waste dump. • Domestic and Inert Waste ○ Provide garbage bins and facilities within the Project site to temporarily store domestic solid waste and construction waste. ○ Waste storage containers shall be covered, tip-proof, weatherproof, and scavenger-proof. ○ Ensure that wastes are not haphazardly dumped within the project site and adjacent areas. • Hazardous waste ○ On the Site allocated for the temporary, short-term keeping of hazardous wastes, ensure compliance with the following safety measures: ▪ Use containers suitable for each type of waste; ▪ Prohibit the use of damaged containers. Check the integrity of containers regularly. ▪ Mark containers adequately; ▪ Provide secondary containment; ▪ Refrain from mixing various waste streams. ○ Hire an authorized Contractor for hazardous waste removal and Keep agreements with hazardous waste management companies active. ○ Keep copies of waste manifests on Site. Keep a record of waste onsite and waste removed. ○ In case of large-scale spills of hazardous liquids, follow the Spill Management Plan.			

9 SUPPLEMENTARY DOCUMENT 2. SITE PHOTO LOG

Panoramic view of the bridge pier location near the Rioni river



Improperly stored hazardous waste

Oil spills near material storage area

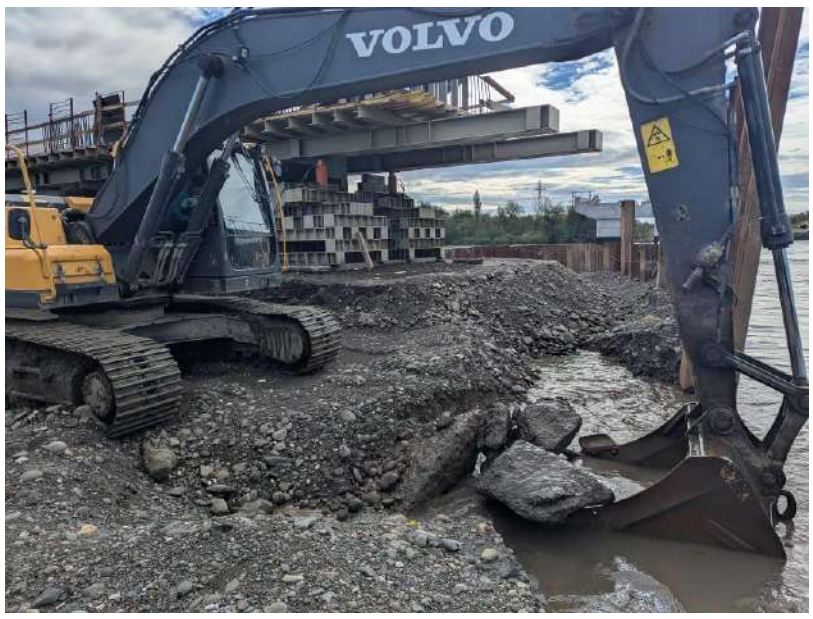
Oil Spills near unused truck

Improperly stored hazardous waste

Hazardous waste storage area

Fuel Station on Site (with minor oil spills)

Cement Residues in the River on the Peninsula



Clearance and remediation activities on the peninsula following the issuance of the NCR

10 SUPPLEMENTARY DOCUMENT 3: ENVIRONMENTAL MONITORING REPOT (OCTOBER 2025)

Batumi bypass road project - Poti-Grigoleti-Kobuleti bypass road

Construction of a bridge crossing and an access road in the territory of Patara Poti

Environmental instrumental monitoring report

Client - JV MIRBUD-CS

Performer:

Ltd "Naseto Group" Ltd

Direqtor: Nato Gabunia

Technical manager: Sergo Khatsava

October, 2025y

Contents

1. Introduction

JV MIRBUD-CS within the framework of the contract signed with the Department of Roads of Georgia, carries out the construction of the section of the E-70 highway of international importance of the

Department of Roads of Georgia, the Senaki-Poti (bypass)-Sarfi (border of the Republic of Turkey) road, the Poti-Grigoleti section (stage 1) - the project of construction of a bridge and access roads on the river Rioni.

It should be noted that the government of Georgia is implementing the program of modernization of the country's main roads, which is led by the Roads Department under the Ministry of Regional Development and Infrastructure of Georgia. The goal of the program is to improve the condition of traffic and cargo transportation with neighboring countries, which is due to the significant increase in cargo transportation through Georgia in the last 10-15 years.

Today, Georgia is the main transit country. Almost two-thirds of the cargo transported in Georgia comes via land routes. Transportation operations by local and international shipping companies are visible on the highways of Georgia. However, the condition of the majority of roads is not up to the required standards and is not properly equipped to withstand the volume of traffic and the proportions of large vehicles. Factors such as insufficient number of two-way carriageways, shortage of routes passing through populated areas, inadequate technical services hinder road permeability and increase transportation time. This creates difficulties for transport companies and their customers, truck drivers, Georgian drivers and local residents. The main goal of the above-mentioned program is the modernization of Georgia's largest roads, such as E-60 and E-70. A number of road infrastructure construction/rehabilitation projects have been funded by the World Bank, Japan International Development Bank (JICA) and Asian Development Bank (ADB).

The construction of the Poti-Grigoleti-Kobuleti bypass road section and the Poti-Grigoleti section of the internationally important Senaki-Poti-Sarfi road is underway within the framework of financing allocated by the European Investment Bank.

2. Brief description of the project

The construction project of E-70 highway Senaki-Poti (bypass)-Sarfi (border of the Republic of Turkey) highway, Poti-Grigoleti section (stage 1) - bridge over Rion river and access roads is being carried out in the Black Sea coastline, Samegrelo-Zemo Svaneti and Western Georgia in the regions of Guria. The goal of the project is to build a 4-lane Poti-Kobuleti highway in accordance with TEM standards and national standards related to highways. At the design stage, the highway was divided into two parts - Grigoleti Kobuleti bypass (lot 1) and Poti-Grigoleti (lot 2) section.

The starting point of Lot 2 is located on the E-60 highway leading to Senaki on the right bank of the Rioni River in the village of Patara Poti. The road bypasses Poti from the east and connects to the initial section of the Grigoleti-Kobuleti bypass road (lot 1) by the Supsa river.

The section included in Lot 2 is also divided into three steps. This report refers to the E60 from the beginning in the direction of the Rioni river, pk 0+000 - pk 1+500 to the picket mark (the section includes the bridge over the Rioni river and the access road).

The road surface will be elastic (asphalt-concrete). Due to the weak soil, the foundation of embankment requires strengthening. For high embankments reinforcement will be done with gravel columns, for low embankments high-strength geotextiles will be used. In both cases, it is planned to use a separating geotextile between the existing soil and the foundation.

Drainage channels will be arranged on both sides of the highway. The project envisages spreading top soil on the slopes of embankment and sowing grass. The length of the bridge will be 495 m, width 15.54 m.

3. Location of the project area

The section of the Poti bridge crossing and access road is located in Patara Poti, on the Rioni river.

situational map showing the location of the project area is given in Figure #3.1.1.

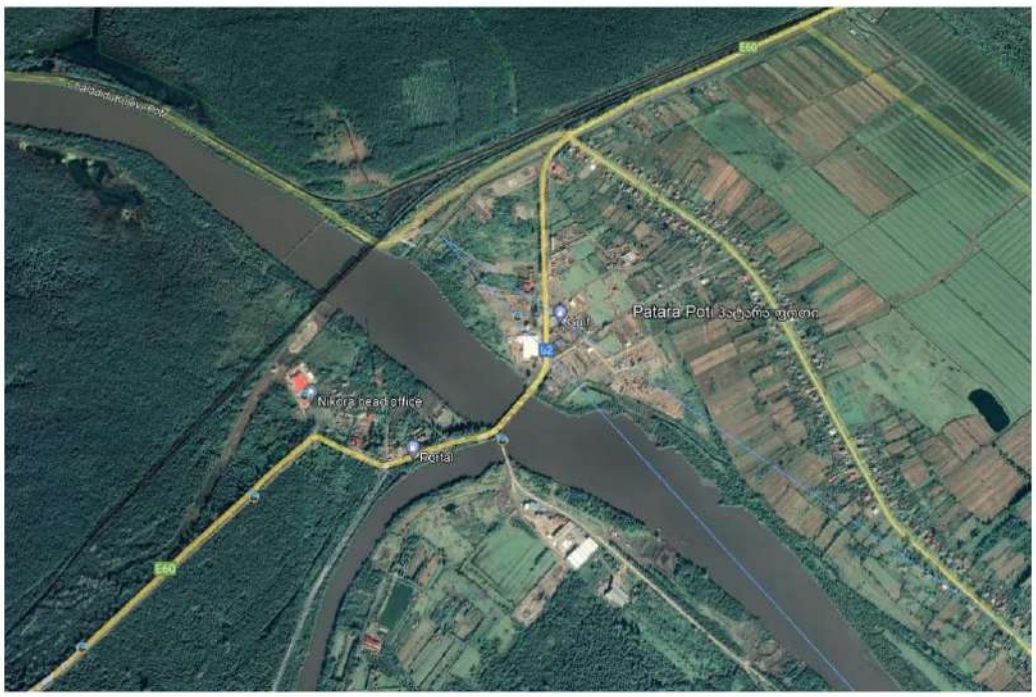


Fig. 3.1.1 - Location of the project area

4. Parameters of conducted monitoring, date of implementation of monitoring, used tools and monitoring points

JV MIRBUD-CS performs monthly environmental instrumental monitoring within the framework of the Poti bridge construction project.

In the month of April, environmental instrumental monitoring was conducted on October 23, 2025, between 11:35 a.m. and 12:50 p.m.

The monitoring was carried out by "Naseto Group" Ltd, based on the order of JV MIRBUD-CS. Instrumental environmental monitoring included the study of the following parameters:

- The spread of noise in the ambient air;
- The spread of vibration in the ambient air;
- The spread of dust in the ambient air (Pm_{25}, Pm_{10}, TSP total);
- The spread of nitrogen and sulfur dioxide and carbon monoxide in the ambient air;
- Surface water monitoring on the following parameters: Ph; saltiness, TDS, Electr. conductivity, turbidity, ammonia/ammonium ion NH3; chlorides Cl; weighted particles TSS; total nitrogen N, total iron Fe; Arsenic (Total) As; Total coliforms

Weather conditions during monitoring

- Air temperature - 17.2° C;
- Wind speed - 3,9m/sc;
- Wind direction - Southeast;
- Air humidity - 73%;
- Atmospheric pressure - 1015 hPa.

Tools used in research

The Instrumental research was carried out by the technical group of "Naseto Group" LTD and the following instruments with the appropriate calibration certificate (certificates are presented as an attachment) were used:

- Pollination - Gasella Mikro Dust Pro (Self-calibration zero and optical filter);
- Vibration- Smart Sensor, AR63B Vibration Meter;
- Noise - Sound Tek ST-109;
- Gases - Aeroqual (CO, NO_2, SO_2);

- Surface water - Multiparameter Water Quality Meter; LAQUA Horiba WQ-330; Turbid meter HANNA HI 98703

Fig. 4.1.1 - Gasella Mikro Dust Pro

Fig. 4.1.2 - AR63B Vibration Meter

Fig. 4.1.3 - Mini Sound Level Meter N05CC

Fig. 4.1.4 - Multiparameter Water Quality Meter

FIg. 4.1.5 - LAQUA Horiba WQ-330

Fig. 4.1.6 - Turbid meter HANNA HI 98703

Information about monitoring points

Instrumental monitoring of the spread of noise, vibration and dust in the ambient air, as well as the spread of other polluting substances in the ambient air was carried out at pre-selected places, in accordance with the instructions of the client. In addition, surface water was taken for instrumental monitoring at 2 points of the Rioni River, above the project area (upstream) and below the project area (downstream).

GPS coordinates of monitoring points for noise, vibration, dust and other pollutants in ambient air are given in table 4.1.1. while, the coordinates of water sampling points from Rioni River are given in Table 4.1.2. In addition, monitoring points are marked on maps 4.1.7 and 4.1.8.

Table 4.1.1 - Location and GPS coordinates of monitoring points for noise, vibration, dust and other pollutants in ambient air

Monitoring point		
#	Location	GPS coordinate
1	Axis 49	X - 723230 Y - 4674705
2	Axis 17	X - 722690 Y - 4674127

Table 4.1.2 - Location and GPS coordinates of water sampling points from Rioni River

Monitoring point		
#	Location	GPS coordinate
1	Riv. Rioni downstream point	X – 722788 Y – 4674713
2	Riv. Rioni upstream point	X - 723505 Y – 4674040

Fig. 4.1.7 - Location of monitoring points for noise, vibration, dust and other pollutants in ambient air

Fig. 4.1.8 - Location of monitoring points of water taken from Rion River

5. Norms established by legislation and results obtained during measurement

5.1 Norms established by legislation

Norms of the qualitative state of the environment are regulated by the Order No. 297/N of the Minister of Labor, Health and Social Protection of Georgia dated August 16, 2001 "On Approval of the Norms of the Qualitative State of the Environment" and also "On Acoustic Noise Norms in the Storerooms and Territories of Residential Houses and Public/Public Institutions Buildings" According to the technical regulations approved by the resolution No. 398 of the Government of Georgia on August 15, 2017.

Table 5.1.1 - Noise norms

№	*Functionality of the premises and areas*	*Admissible norms*		
		L Day (dbA)		
		Day	*Evening*	*L Night*
1	Educational institutions and reading rooms	*35*	*35*	*35*
2	Treatment cabinets of medical institutions	*40*	*40*	*40*
3	Living and sleeping rooms	*35*	*30*	*30*
4	Treatment and rehabilitation wards of a stationary medical institution	*35*	*30*	*30*
5	Hotel/guest house/motel rooms	*40*	*35*	*35*
6	Shopping halls and reception rooms	*55*	*55*	*55*
7	Halls of restaurants, bars, cafes	*50*	*50*	*50*
8	audience/audience halls and sacral rooms	*30*	*30*	*30*
9	Gyms and pools	*55*	*55*	*55*
10	Working rooms of small offices (<100 m^3) and working rooms without office equipment	*40*	*40*	*40*
11	Working rooms of large offices (≥100 m^3) and working rooms with office equipment	*45*	*45*	*45*
12	Deliberative rooms	*35*	*35*	*35*
13	Areas directly adjacent to low-rise (number of floors ≤6) residential houses, medical facilities, children's and social service facilities	*50*	*45*	*40*
14	Areas directly adjacent to multi-storey residential buildings (number of floors > 6), cultural, educational, administrative and scientific institutions	*55*	*50*	*45*
15	Areas directly adjacent to hotels, trade, service, sports and public organizations	*60*	*55*	*50*

Table 5.1.2 - Norms of vibration and vibroacceleration

#	*Admissible norms*	
	Vibrospeed	*Vibroacceleration*
1	112 db	126 db

Table 5.1.3 - Norms of dust and other pollutants

#	*Admissible norm of dust mg/m3*	*Norm of nitrogen dioxide, mg/m3*	*Norm of sulfur dioxide mg/m3*	*Carbon monoxide norm, mg/m3*	*The norm of total hydrocarbons, mg/m3*
1	0.5 mg/m³	0.2	0.5 mg/m³	5 mg/m³	1 mg/m³

Table 5.1.4 - Maximum admissible norms in the surface water body

№	*Parameter*	Admissible norm
1	*PH*	*Unfixed*
2	*Saltiness*	*Unfixed*
3	*TDS/mg.1*	*Unfixed*
4	*Elect. conductivity*	*Unfixed*
5	*Turbidity*	*Unfixed*
6	*Ammonia/ammonium ion NH3*	*0,39*
7	*Chlorides Cl*	*300*
8	*Weighted particles TSS*	*Unfixed*
9	*Total nitrogen N*	*Unfixed*
10	*Total iron Fe*	*0,3*
11	*Arsenic (total) As*	*0,05*
12	*Total coliforms*	*It should not be found in 300 ml*

5.2 Results of conducted research (monitoring).

Table 5.2.1 - Results of conducted research, noise, vibration, dust

№	Measurement point		Measurement results								
	Location	GPS coordinate	Noise Amax db	Vibro speed		Vibro acceleration		Dust mg/m3		
				mm/sc	db	m/sc2	db	Pm2.5	Pm10	Total
1	Axis 49	X - 723230 Y - 4674705	52,6	<0.1	<66	<0.1	<100	0.009	0.017	0.023
2	Axis 17	X - 722690 Y - 4674127	51,7	<0.1	<66	<0.1	<100	0.011	0.019	0.028

Table 5.2.2 - Other ambient air pollutants

№	Measurement point		Measurement results		
	Location	GPS coordinate	Nitrogen dioxide	Sulfur dioxide	Carbon monoxide
	Axis 49	X - 723230 Y - 4674705	0,009	<0,01	0,26
	Axis 17	X - 722690 Y - 4674127	0,011	<0,01	0,19

Table 5.2.3 - Results of instrumental measurement of physico-chemical parameters of surface water

№	Sampling location	GPS Coordinate	Measured parameters				
			PH	Saltiness	TDS/mg.l	Electr. conductivity	Turbidity
	River Rioni, the lower point of a stream	X – 722788 Y - 4674713	8,20	0,10	127	231	101
	River Rioni, the upper point of a stream	X - 723505 Y - 4674040	8,21	0,10	129	229	102

Table 5.2.4 - Results of measurement of chemical and bacteriological parameters of surface water taken from Rioni river (upstream)

Sampling location	GPS coordinate of sampling	Determining characteristic, name	Unit	Research result	Research method
Riono River, upstream	X - 723505 Y - 4674040	Ammonia/ammonium ion NH_3	mg/l	0,19	GOST 33045-2014
		Chlorides Cl	mg/l	81,0	ISO 9297:198/2008
		Weighted particles TSS	mg/l	106,0	ISO 11923-97
		Total nitrogen N	mg/l	2,72	GOST 33045-2014
		Total iron Fe	mg/l	0,22	GOST 4011-72
		Arsenic (total) As	mg/l	0,0039	GOST 4152-89
		Total coliforms	300 ml will not be allowed	Not found	ISO 9308-1:2014

Table 5.2.5 - Results of measurement of chemical and bacteriological parameters of surface water taken from Rioni river (downstream)

Sampling location	GPS coordinate of sampling	Determining characteristic, name	Unit	Research result	Research method
Rioni River, downstream	X – 722788 Y - 4674713	Ammonia/ammonium ion NH_3	mg/l	0,20	GOST 33045-2014
		Chlorides Cl	mg/l	79,0	ISO 9297:198/2008
		Weighted particles TSS	mg/l	108,0	ISO 11923-97
		Total nitrogen N	mg/l	2,76	GOST 33045-2014
		Total iron Fe	mg/l	0,26	GOST 4011-72
		Arsenic (total) As	mg/l	0,0040	GOST 4152-89
		Total coliforms	300 ml will not be allowed	No found	ISO 9308-1:2014

6. Conclusion

As a result of the conducted environmental instrumental research, there was no exceedance of the established norm in any measurement point, in the case of any parameter.

7. Mitigation measures

No mitigation measures are required.

8. Instrument calibration certificates

8.1 Vibration meter calibration certificate

IF-03.G

შპს "მეტროლოგი"
"METROLOGY" LLC

0144, თბილისი, ზვიად გამსახურდიას გამზ. 191
191 Zviad Gamsakhurdia Ave, Tbilisi, 0144
ტელ./Phone: +995 (32) 2-700-800, www. metrology.ge

GAC – CL – 0017
სსტ ისო/იეკ 17025:2017/2018
11.11.2021 – 11.11.2025

საკალიბრებელი ლაბორატორია
CALIBRATION LABORATORY

დაკალიბრების სერტიფიკატი № 2983
CALIBRATION CERTIFICATE

გაცემის თარიღი
Date of issue: 30.01.2023

დაკალიბრების ობიექტი
Calibrated item: ვიბრაციის საზომი ხელსაწყო AR63B, SN 02292117
გასაზომ სამუალების დასახელება/ტიპი/სერიული ნომერი
measuring instrument identification

დამკვეთი
Customer: ფიზიკური პირი სერგო ხაცავა, თბილისი, ჰეკნის გამზ. 14/2
დასახელება, მისამართი
name of customer, address

დაკალიბრების მეთოდი
Method of Calibration: CP-062.G; გოსტ 30652-99
მეთოდის დასახელება/იდენტიფიკაცია
name of the method/identification

დაკალიბრება შესრულებულია
Calibration is performed by using: ვიბროგარდამქმნელი ABC-034-03 № 8113994
სერტ. № GE/ML/05-02093-21 21.09.21; ვიბროსტენდი ВЭДС-10А
სამუშაო ეტალონის დასახელება/ტიპი/სერიული ნომერი
description of the standard measuring instrument /identification

მიკვლევადობა:
Traceability: GEOSTM/Ukrmetrteststandard/BIPM/CMC

დაკალიბრების ადგილი
Calibration Site: ☒ მომსახურებლის ლაბორატორია/Supplier's Lab. ☐ დამკვეთის ობიექტი/Customer's Site

დაკალიბრების პირობები
Ambient condition: t 20.4°C; RH 40%

დაკალიბრების შედეგები იხილეთ ცხ-2 გვერდ(ებ)ზე
See Calibration Results on page(s)

ლაბორატორიის უფროსი
Chief of laboratory: ლ. ნაზოშვილი
სახელი, გვარი
name

პირის ხელმოწერა, რომელმაც ჩაატარა დაკალიბრება
Signature of the person who performed calibration: ზ. ცქიტიშვილი
სახელი, გვარი
name

ხელმოწერა, ბეჭედი
signature, stamp

ცხ 1 2-დან

8.2 Noise meter calibration certificate

IF-03.G

შპს "მეტროლოგი"
"METROLOGY" LLC

0144, თბილისი, ბერი გაბრიელ სალოსის გამზ. 191
191 Beri Gabriel Salosi Ave, Tbilisi, 0144
ტელ./Phone: +995 (32) 2-700-800, www. metrology.ge

საქ GAC
GAC – CL – 0017
სსტ ისო/იეკ 17025:2017/2018
11.11.2021 – 11.11.2025

საკალიბრებელი ლაბორატორია
CALIBRATION LABORATORY
დაკალიბრების სერტიფიკატი № 2982
CALIBRATION CERTIFICATE

გაცემის თარიღი Date of issue	30.01.2023
დაკალიბრების ობიექტი Calibrated item	ხმაურმზომი, Sound Level Meter N 05CC საზომი საშუალების დასახელება/იდენტიფიკაცია measuring instrument identification
დამკვეთი Customer	ფიზიკური პირი სერგო ხაცავა, თბილისი, პეკინის გამზ. 14/2 დასახელება, მისამართი name of customer, address
დაკალიბრების მეთოდი Metrhod of Calibration	CP-092.G; გოსტ 8.635-2013 პროცედურის დასახელება/იდენტიფიკაცია name of the procedure/identification
დაკალიბრება შესრულებულია Calibration is performed by using	ხმაურის კალიბრატორი Model ND9B SN 922509 სერტ. №01Ak0321 11.02.2021 საზომი საშუალების დასახელება/იდენტიფიკაცია description of the standard measuring instrument /identification
მიკვლევადობა Traceability	Protos/UME/BIPM/CMC
დაკალიბრების ადგილი Calibration Site	☒ შემსრულებლის ლაბორატორია/Supplier's Lab. ☐ დამკვეთის ობიექტი/Customer's Site
დაკალიბრების პირობები Ambient condition	20.4°C; RH 37%; 98.1kPa

დაკალიბრების შედეგები იხილეთ 2 გვერდ(ებ)ზე
See Calibration Results on ___ page(s)

ლაბორატორიის უფროსი Chief of laboratory	ლ. ნანობაშვილი სახელი, გვარი name	ხელმოწერა, ბეჭედი signature, stamp
პირის ხელმოწერა, რომელმაც ჩაატარა დაკალიბრება Signature of the person who performed calibration	ზ. ცქიტიშვილი სახელი, გვარი name	

21397727

20 07 23

გვ. 1 2-დან

8.3 Dust meter calibration certificate

CASELLA

Certificate of Calibration and Conformity

Instrument Type	CEL-712 Microdust Pro		
Serial Number	[illegible]	Probe Serial Number	[illegible]
Firmware revision	[illegible]		

Calibration Principle:

The sensitivity of this instrument has been established using a factory reference 'Calibration Insert'. The 'Calibration Insert' utilises the optical light scattering technique.

The factory reference 'Calibration Insert' has demonstrated traceability to gravimetric calibration using Casella's Wind tunnel dust generation system using ISO 12103-1 A2 Fine test dust (Natural ground mineral dust, predominantly silica, Arizona Road Dust equivalent. Particle size range 0.1 to 80 µm).

The value shown on the supplied user 'Calibration Insert' is to provide a stable method for the user to return to the instrument sensitivity level back to factory conditions and thus traceable to wind tunnel gravimetric tests.
For calibration and optimum accuracy to user specific dusts types and conditions, please refer to the user handbook.

Test Conditions:

Temperature :-	21.9	°C
Humidity :-	55	%RH
Pressure :-	1017	mBar

Equipment used for Calibration of "Reference Insert":

Wind Tunnel:-	Casella Wind Tunnel	Serial Number:	EQ10732
Microbalance:-	Cahn C-32	Serial Number:	EQ10960
Velocity Probe:-	Air Velocity Probe	Serial Number:	EQ11303
Flow Meter:-	Gilibrator 3	Serial Number:	EQ11242

Calibration Results:

Casella Factory Reference 'Calibration Insert' :-	Serial Number:	EQ11062	Value:	15.595
Supplied 'Calibration Insert' For Probe :-	Serial Number:	0325879	Value:	110.1

Declaration of conformity:

This test certificate confirms that the instrument as specified above has been successfully tested and adjusted to comply with the manufacturer's published specifications.

This product is certified as being compliant to the requirements of the CE Directive.

Test Engineer: Nicola Cartwright
Date of Issue: [illegible]

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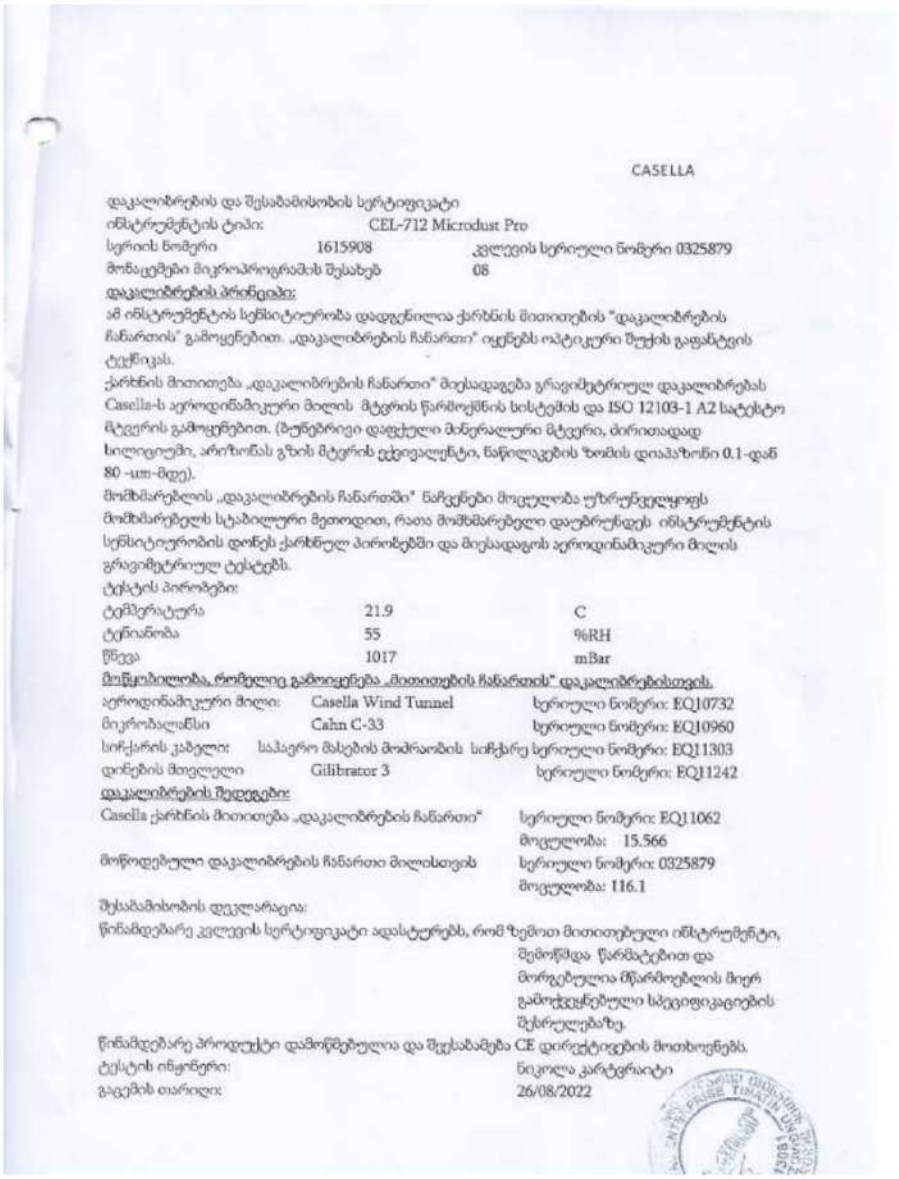

CASELLA

დაკალიბრების და შესაბამისობის სერტიფიკატი

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სერიის ნომერი 1615908 კვლევის სერიული ნომერი 0325879

მონაცემები მიკროპროგრამის შესახებ 08

დაკალიბრების პრინციპი:

ამ ინსტრუმენტის სენსიტიურობა დადგენილია ქარხნის მითითების "დაკალიბრების ჩანართის" გამოყენებით. „დაკალიბრების ჩანართი" იყენებს ოპტიკური შუქის გაფანტვის ტექნიკას.

ქარხნის მითითება „დაკალიბრების ჩანართი" მიესადაგება გრავიმეტრიულ დაკალიბრებას Casella-ს აეროდინამიკური მილის მტვრის წარმოქმნის სისტემის და ISO 12103-1 A2 სატესტო მტვერის გამოყენებით. (ბუნებრივი დაფქული მინერალური მტვერი, პირითადად სილიციუმი, არიზონას გზის მტვრის ეკვივალენტი, ნაწილაკების ზომის დიაპაზონი 0.1-დან 80 -ამ-მდე).

მომხმარებლის „დაკალიბრების ჩანართში" ნაჩვენები მოცულობა უზრუნველყოფს მომხმარებელს სტაბილური მეთოდით, რათა მოშხმარებელი დაუბრუნდეს ინსტრუმენტის სენსიტიურობის დონეს ქარხნულ პირობებში და მიესადაგოს აეროდინამიკური მილის გრავიმეტრიულ ტესტებს.

ტესტის პირობები:

ტემპერატურა	21.9	C
ტენიანობა	55	%RH
წნევა	1017	mBar

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აეროდინამიკური მილი:	Casella Wind Tunnel	სერიული ნომერი: EQ10732
მიკრობალანსი	Cahn C-33	სერიული ნომერი: EQ10960
სიჩქარის კაბელი:	საპაერო მასების მოძრაობის სიჩქარე სერიული ნომერი: EQ11303	
დინების მთვლელი	Gilibrator 3	სერიული ნომერი: EQ11242

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მოწოდებული დაკალიბრების ჩანართი მილისთვის	სერიული ნომერი: 0325879 მოცულობა: 116.1

შესაბამისობის დეკლარაცია:

წინამდებარე კვლევის სერტიფიკატი ადასტურებს, რომ ზემოთ მითითებული ინსტრუმენტი, შემოწმდა წარმატებით და მორგებულია მწარმოებლის მიერ გამოქვეყნებული სპეციფიკაციების შესრულებაზე.

წინამდებარე პროდუქტი დამოწმებულია და შეესაბამება CE დირექტივების მოთხოვნებს.

ტესტის ინჟინერი: ნიკოლა კარტვრიატი

გაცემის თარიღი: 26/08/2022

ორიათას ოცდაორი წლის 02.11.
On two thousand twenty-two
მე, ნოტარიუსს ქ. თბილისში მ. გოგოლაძეს, რომლის სანოტარო ბიურო მდებარეობს თბილისის, აღმაშენებლის გამზ N 183,
Before me, Marika Gogoladze, notary of Tbilisi City, notary office located in Tbilisi, 183, D. Agmashenebeli Ave.
მოწმეთა მიერ ელისო გვასალიამ (უმაღლესი განათლების მქონე მთარგმნელმა, დაბ. 08.02.1976; ქ. თბილისი, მკვ. - წყნეთი, ა ზონა, მე13 კოტეჯი, ID 13IB00564 პ/ნ 62003000961 გაც. იუსტიციის სამინისტროს მიერ 23.06.2013).
was personally appropriated Mrs. Eliso Gvasalia translator owing high-school diploma, born in 08.02.1976, C. Tbilisi, residing in Tskneti, a zone, 13th Cottage, ID Card No. 13IB00564 p/n 62003000961, issued in 23.06.2013 by Ministry of Justice.
მან წარმოადგინა დოკუმენტი ერთ ფურცელზე, მისივე თარგმანი და მოითხოვა თავისი ხელმოწერის ნამდვილობის სანოტარო წესით დამოწმება.
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ნოტარიუსი:
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Marika Gogoladze

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სანოტარო მოქმედების რეგისტრაციის ნომერი	N221498054
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ნოტარიუსი	მარიკა გოგოლაძე
სანოტარო ბიუროს მისამართი	საქართველო ქ.თბილისი დავით აღმაშენებლის გამზირი N183
სანოტარო ბიუროს ტელეფონი	marikagogoladze@notary.ge
სანოტარო მოქმედების იდენტიფიკაციური ნომერი	86512612809322

სანოტარო მოქმედებისა და სანოტარო აქტის შესახებ ინფორმაციის (ბიჭი შექმნის, შეცვლის და/ან გაუქმების შესახებ) მიღება-გადაცემისა შეგიძლიათ საქართველოს ნოტარიუსთა პალატის ვებ-გვერდზე: www.notary.ge ასევე შეგიძლიათ დარეკოთ ტელეფონზე: +995(32) 2 66 19 18

11 SUPPLEMENTARY DOCUMENT 5: RIONI RIVER ICHTHYOLOGICAL STUDY

შპს „აქვაჯე - აქუაკალჩერ კონსალტინგ სერვისის“
AquaGe – Aquaculture Consulting Services” LTD

Ichthyological survey conducted in the northern branch of the Rioni River within the framework of the Poti Bridge and Access Roads Construction Project

Research report

Tbilisi

2025 year

Introduction

The submitted research was conducted by the JV"Mirbud-CS" I/N 216501140 (hereinafter referred to as the "Client") and LLC "Aquage" I/N 400100680 (hereinafter referred to as the "Performer") Within the framework of the agreement concluded between, which provides for:

- Ichthyological research of the Rioni River (especially with regard to the sturgeon species),
  In particular:
- Determination of the species composition of fish on the Rioni River at points specified by the agreement;
- Determining the diversity of intraspecific structure and life strategies for fish species that are considered as target objects within the scope of the field study;
- Determining the category of species (massive, rare, Red Book species);
- Identification of species that are indicators of the state of river ecosystems;
- Assessment of the status of species (abundance, spawning periods, body length and weight, age and sex;
- composition, distribution and localization in areas defined by the river treaty;
- Assessment of anthropogenic impacts, threats and sources of risks;
- Preparing a report based on the results of the research and submitting it to the client.

Based on the tasks specified in the contract and the permit for fishing for scientific purposes issued by the Ministry of Environment and Agriculture, a group of experts conducted field scientific research at the locations indicated by the customer on the Rioni River in early September 2025.

This report presents a description of the research conducted, an analysis of its results, and the conclusions drawn based on the results and recommendations issued to the client.

Chapter 1. Results of desk research

1.1. General information about the Rioni River

Among the rivers of Georgia, the Rioni River ranks second in length after the Mtkvari River. It surpasses all the rivers of Georgia. The pool Holds West Georgia Territory Important Part . It Origin takes Caucasus South on the lap Located Mountain "Price Rock" From the crack Based on Source and Eden's Glacier Melting Water By joining. The Rioni River basin is separated from the Enguri River basin by the Svaneti Range, from the Mtkvari River basin by the Surami and Meskheti ranges, and from the Supsa River basin by the Guria Watershed Range.

It exceeds all the rivers of Georgia in terms of water volume. The length of the river is 327 km, the area of the watershed is 13390 sq. km. The river originates from an altitude of 2347 meters, the average width of the basin is 91 km, the average slope of the Rioni is 0.0071 m. The upper course of the river is characterized by a high slope index, while the slope in the lower course is insignificant.

The development of the river network of the basin depends on the geological structure, hypsometric development, soil and plant cover, and the amount of atmospheric precipitation entering the basin.

River Rioni Pool Hydrographic Network

Table 1.

No.	River name	Pool area, m ²	River length, km.	Height of the head, m.	Elevation of the confluence, m.	Average river drop per 1 km
1.	Rioni	13390	327	2347	0.0	7.2
2.	chishura	98.0	15.0	2323.0	1340.0	65.5
3.	Khvargula	14.0	6.8	3627.0	1551.0	305.3
4.	Jejora	438.0	56.0	2915.0	755.0	38.6
5.	Lukhunistskali	194.0	39.0	2454.0	6112.0	47.2
6.	Ritseula	160.0	24.0	339.0	510.0	61.6
7.	Lajanuri	297.0	41.0	2454.0	361.0	51.7
8.	Tskhenistskali	2117.0	183.0	2708.0	13.0	14.7
9.	Lascanura	127.0	24.0	3072.0	703.0	98.9
10.	Sakura	155.0	32.0	2880.0	853.0	63.3
11.	Kvirila	4526.0	155.0	1899.0	87.0	11.7
12.	Dzirula	1270.0	103.0	1408.0	171.0	12.0
13.	Khanistskali	921.0	60.0	2411.0	77.0	38.7
14.	Chkherimela	490.0	32.0	789.0	196.0	18.5

1.1.2. Main calculation characteristics of the Rioni River runoff

1.1.2.1. Annual flow of the Rioni River

The annual runoff norm, also called the average multi-year runoff, is sometimes referred to as the "average water content" or "average runoff," etc. Determining the annual runoff norm is of great importance for the ecology (their life cycle) of fish (especially anadromous fish).

The stability of the annual runoff norm is relative and cannot be understood in an absolute sense. Indeed, if the amounts of precipitation and evaporation change as a result of climatic conditions or human activity, the annual runoff norm will also change.

Flow rate of the Rioni River and some rivers in its basin

Table 2.

No.	River - Observation Point	Norm	Observation
		m ^{3}/second	Length of years (n)
1	Rioni - Oni	45	56
2	Rioni - Khidkari	73	52
3	Rioni - Alpana	107	50
4	Rioni - Gumati	139	49
5	Rioni - Sakochakidze	418	62
6	Kvirila - Zestaponi	55	49
7	Khanistskali - Baghdad	15.8	56
8	Lajanuri - Orbeli	9.9	33

1.1.2.2. Maximum runoff

Maximum runoff occurs during spring floods and rainstorms.

Spring floods are one of the phases of the river water regime, characterized by the greatest water content during the year, prolonged increases and decreases in discharges and levels.

This phase repeats every year and at the same time in every district.

The Rioni River is fed by snowmelt and glacier meltwater at this time. The Rioni River is characterized by mixed floods, as snowmelt and glacier melt are sometimes accompanied by rain.

Rainfall is also one of the phases of the river water regime, which is characterized by relatively rapid increases and decreases, sometimes such increases and decreases that they even exceed the costs of spring floods. Rainfall occurs irregularly, and in some areas not every year.

The source of nutrition for rivers during this phase is mainly rainwater.

Maximum runoff rate and error calculated by formulas

For the Rioni River

Table 3.

Point	Oni	Khilikar	Alpana	With a gun	Sakochakidze
The length of the queue (n	56	53	61	41	62
Norm m ³/ second	188	339	491	602	2030
Error,%	1.41	0.54	0.42	1.13	1.44

When calculating maximum costs, it is of great importance to record the so-called rare recurring costs, i.e. 0.01% provision, these are:

Table 4.

No.	Point	Average m ³ /second	Rare m ³/second	
			0.01%	0.1.%
1	Oni	188	663	555
2	Khidikari	339	867	747
3	Alpana	491	1250	979
4	Gumati	602	4394	3210
5	Sakochakidze	2030	9094	63146

A 0.01% guarantee means that this cost will recur once every 10,000 years,

And 0.1% of the time – once every 1000 years.

Floods and flash floods of varying intensity are observed in the Rioni River basin every year, but cases of large flash floods develop in completely different situations.

Drastic changes in the natural hydrological regime of rivers caused by anthropogenic factors often have a radical impact on the living conditions of fish species (especially anadromous fish) (this especially applies to migration conditions).

In 1939, in order to protect the city of Poti from flooding, the Rioni River was diverted north of Poti, into the Nabada River bed.

In 1959, the Rioni River Watershed Rab-Regulator was put into operation, the purpose of which was to divert water flow of 400 m3/s in the old bed of the Rioni River and transport the corresponding sediment to the "Didi" Island area. The watershed failed to function due to the small inclination of the old bed caused by the flooding; when diverting a flow of approximately 200 m3 / s, the surrounding area was flooded with water.

Several hydroelectric power plants and reservoirs have been built on the Rioni River and its tributaries: Rioni (1933), Gumati (1958), Lajanuri (1962), Vartsikhe (1971), and others. The constructions have had a significant impact on the calendar distribution of the Rioni River's runoff and the annual quantitative indicators of sediment.

Reservoirs built in the Rioni River basin have reduced the transport of solids. Also, numerous sand quarries operating in the lower reaches of the Rioni River have a significant negative anthropogenic impact.

1.2. Composition and characteristics of the freshwater ichthyofauna of Georgia

According to the geographical division of the Palearctic based on the distribution of freshwater fish, Georgia is part of the Ponto-Caspian-Aral province of the Mediterranean subregion, and within the province, the territory of Georgia is divided into two regions: Western Georgia belongs to the Ponto (Black Sea) region, and Eastern Georgia to the Caspian region.

Both regions are divided into parcels: the first into three parcels — Danube-Kuban, Colchis-Anatolian, and North Aegean, and the second into two parcels — Volga and Mtkvari-Iran. Western Georgia is part of the Colchis-Anatolian parcel, and Eastern Georgia — of the Mtkvari-Iranian.

Thus, Georgia does not represent a zoogeographical unity in terms of the distribution of freshwater fish. The unit that unites its two parts - the Ponto-Caspian-Aral province, which includes the basins of the Black, Caspian and Aral Seas, as well as the rivers flowing into the Northern Aegean Sea - extends beyond the territory of Georgia, which represents only a small part of this province.

The table below presents a picture of the composition and distribution of freshwater ichthyofauna in the main river basins of Georgia. It includes 71 species (80 forms with subspecies), belonging to 16 families and 46 genera.

The species and genera within the families are distributed as follows:

Distribution of species and genera among families.

Table 5

No.	Family		Last name	Species
	Latin name	Georgian name		
1	Petromyzontidae	სალამურასებრნი	2	2
2	Acipenseridae	ზუთხისებრნი	2	5
3	Engraulidae	ქაფშისებრნი	2	2
4	Salmonidae	ორაგულისებრნი	2	5
5	Coregonidae	სიგისებრნი	1	3
6	Cyprinidae	კობრისებრნი	27	45
7	Cobitidae	ხლაკუნასებრნი	2	2
8	Siluridae	ლოქოსებრნი	1	1

9	Poeciliidae	გამზუზიასებრნი	1	1
10	Anguillidae	გველთევზასებრი	1	1
11	Esocidae	ქარიყლაპიასებრნი	1	1
12	Atherinidae	ათერინისებრნი	1	2
13	Mugilidae	კეფალისებრნი	2	4
14	Percidae	ქორჭილასებრნი	2	2
15	Gobiidae	ღორჯოსებრნი	5	12
16	Gasterosteidae	მახათისებრნი	1	1
17	Syngnathidae	ნემსთევზასებრნი	3	7
Total			56	96

Excluding species acclimatized by humans from this list, we have: 15 families, 53 genera, and 64 species. Almost half of the forms belong to the family of carp (Surrinidae), which is thus represented with the greatest diversity in the fauna of Georgia.

More than half of the families are represented by one or two species, some of which are extremely rare and only single specimens can reach the fresh waters of Georgia from the Black Sea (e.g., the Anguillidae family). Others, which are essentially marine forms, only periodically or more or less permanently inhabit river mouths and a few coastal reservoirs, such as Paleostomi Lake (among them are representatives of the Mugilidae, Gasterosteidae, Syngnathidae, and Atherinidae families). The same can be said about most of the Gobiidae, the only difference being that the latter do not make large-scale migrations to the sea and remain in estuaries and parts of rivers located close to them.

The Petromyzontidae family of salamanders is represented by the extremely rare Ukrainian brook lamprey (Eudontomyzon mariae) and the Caspian lamprey (Caspiomyzon wagneri).

Of the remaining families — sturgeon (Acipenseridae), salmonids (Salmonidae), except for trout, and perch (Percidae), except for river perch (Perca fluviatilis) — are represented in Georgia by migratory forms.

The families Siluridae and Esocidae are represented by one species each in Georgia, and these species are among the most widespread.

Thus, the most characteristic, diverse and numerous fish species in the freshwaters of Georgia are representatives of the Cyprinidae and Gobiidae families. They also contain the largest number of unique endemic forms.

Of the above-listed families, only the Salamiidae, Salmonidae, Carpidae, Loachidae, and Gorjoidae are represented in both western and eastern Georgia. The remaining families belong exclusively to western Georgia.

Species distribution of ichthyofauna between eastern and western Georgia

Surnames common between Western and Eastern Georgia	Surnames represented only in Western Georgia	Surnames represented only in Eastern Georgia
Salmon	Acipenser	Caspiomyzon
Leuciscus	Huso	Coregonus
Aspius	Caspialosa	Leucalburnus
Chondrostoma	Clupeonella	Alburnus
Goby	Rutilus	Acanthobrama
Varicorhinus	Phoxinus	
Barb	Scardinius	
Chalcalburnus	Tench	
Alburnoides	Blicca	
Cyprinus	Abramis	
Cobitis	Vimba	
Silurian	Rhodeus	
Gobius	Anguilla	
Nemachilus	Esox	
Lamprey	Atherina	
Carassius	Mugil	
Neogobius	Zander	
	Perch	
	Pomatoschistus	
	Knipowitschia	
	Mesogobius	
	Zosteritis	
	Proterorhinus	
	Pungitius	
	Gasterosteus	
	Syngnathus	

The differences and significantly greater diversity of the general composition of the ichthyofauna of Western Georgia are largely due to the influence of the Black Sea. And the distant bull Caspian Sea East On the ichthyofauna of Georgia It has a weak influence today.

The most numerous group, approximately 50%, consists of genera characteristic of the Mediterranean subregion.

Thus, the general composition of the ichthyofauna of Georgia is presented as follows:

	% of total number
1. Genera widespread in the Holarctic	38.64
2. Surnames characteristic of the Mediterranean subregion	47.72
Including endemic to this subregion	20.4
3. Genera endemic to the Ponto-Caspian-Aral province	13.64
Including the endemic for the Eastern Transcaucasia	4.5

When systematizing the species composition of Georgia's ichthyofauna according to its main distribution areas, the following elements can be distinguished:

1) Northern species,
2) Mediterranean and ocean species
3) Elements of Southern European River Basins
4) Autochthons of the Ponto-Caspian river basins, and Transcaucasia endemic species (with narrow distribution areas)
5) Middle Eastern elements,
6) Acclimatized species

1.3. Rioni River Ichthyofauna of the basin

The general list of fish common in the waters of Western Georgia includes 52-53 species, of which 28 are freshwater species.

Freshwater fish species of the Rioni River basin

Freshwater fish
1. Salmo trutta Linnaeus, 1758
2. Squalius cephalus (Linnaeus, 1758) (= Leuciscus cephalus orientalis Nordmann, 1840)
3. Alburnoides bipunctatus fasciatus (Nordmann, 1840)
4. Vimba vimba (Linnaeus, 1758)
5. Chondrostoma colchicum Derjugin , 1899
6. Barb escherichia Steindachner , 1897
7. Gobio lepidolaemus Caucasian Kamensky , 1901
8. Phoxinus phoxinus colchicus Berg, 1910

9. Alburnus derjugini Berg, 1923
10. Neogobius (Ponticola) constructor (Nordmann, 1840)
11. Eudontomyzon mariae (Berg, 1931)
12. Scardinius erythrophthalmus (Linnaeus, 1758)
13. Tench tench (Linnaeus, 1758)
14. Abramis brama (Linnaeus, 1758),
15. Esox lucius Linnaeus, 1758,
16. Perch fluviatilis Linnaeus, 1758
17. Rutilus rutilus (Linnaeus, 1758)
18. Aspius aspius (Linnaeus, 1758)
19. Capoeta sieboldi (Steindachner , 1864)
20. Capoeta tinca (Heckel , 1843)
21. Blicca bjoerkna (Linnaeus, 1758)
22. Carassius gibelio
23. Mesogobius batrachocephalus (Pallas, 1814)
24. Proterorhinus marbled
Passage and sea
25. Salmo labrax Pallas, 1814 (=Salmo trutta labrax Pallas, 1814),
26. Huso huso (Linnaeus, 1758)
27. Acipenser gueldenstaedtii Brandt & Ratzeburg , 1833
28. Acipenser sturio Linnaeus, 1758,
29. Acipenser nudiventris Lovetsky , 1828,
30. Acipenser stellatus Pallas, 1771
31. Acipenser persicus Colchicum
32. Atherina Mochon Pontic Eichwald , 1831
33. Sander lucioperca (Linneaus , 1758)
Suspicious (In terms of distribution in the Rioni River)
34. Sander lucioperca (Linneaus , 1758)
35. Mugil cephalus Linnaeus, 1758)
36. Liza aurata (Risso,1810)
37. Liza saliens (Risso , 1810)
38. Gobiidae sp.
39. Gasterosteus aculeatus Linnaeus, 1758

40. Anguilla anguilla (Linnaeus, 1758),

The ichthyofauna of the Rioni River itself is quite well known. 28 - 29 species of fish are found in the Rioni River:

Ichthyofauna of the Rioni River
1. Salmo trutta Linnaeus, 1758
2. Salmo labrax Pallas, 1814 (=Salmo trutta labrax Pallas, 1814),
3. Rutilus frisii frisii - Whirlpool bream
4. Squalius cephalus - catfish
5. Scardinius erythrophthalmus - Redfin
6. Leuciscus aspius - Zerekhi
7. Chondrostoma colchicum - Colchian toby
8. Gobio lepidolaemus caucaisca Kamensky, 1901 - Caucasian goby
9. Capoeta sieboldii (Steindachner, 1864) - Colchian sedge
10. Capoeta tinca - Anatolian tench
11. Barbus tauricus escherichi - Colchian barb
12. Alburnus derjugini Berg, 1923 - Batumi Shamaya
13. Alburnoides bipunctatus (Bloch, 1782) (= Alburnoides bipunctatus eihwaldi, Filippi, 1863) -
14. Alburnoides bipunctatus - F Rita
15. Abramis brama - bream
16. Rhodeus sericeus - Tafela
17. Vimba vimba tenella - Lesser vimba
18. Cyprinus carpio - carp
19. Cobitis taenia - Transcaucasian tapeworm
20. Silurus glanis - catfish
21. Mugil cephalus - mullet (in the river mouth)
22. Perca fluviatilis - perch
23. Neogobius (Ponticola) constructor - Caucasian goby
Migratory fish species in Rioni include the following:
24. Huso huso (Linnaeus, 1758) - Hop
25. Acipenser gueldenstaedtii Brandt & Ratzeburg , 1833 - Russian sturgeon
26. Acipenser sturgeon Linnaeus, 1758 - Atlantic sturgeon
27. Acipenser nudiventris Lovetsky , 1828 - Forage (carrion)

28. Acipenser stellatus Pallas, 1771 - Tarragona
29. Acipenser persicus Colchicum - Colchian sturgeon

The most common species of freshwater fish in the Rioni River are bream, bream, and crucian carp. They are caught locally, mainly for their own consumption. Carp and catfish are also caught (in the lower and middle reaches of the river). Sturgeon species are protected by the state.

1.4. Species composition of sturgeons

The species composition of sturgeon species along the Georgian Black Sea coast and in the rivers flowing into it, according to a number of experts, still retains its historical diversity. Nevertheless, there are opinions that it is doubtful that species such as the Atlantic sturgeon (Acipenser sturio) can migrate into the Rioni River.

1.4.1. *Bastard sturgeon, Forage (Iarghala) - Acipenser nudiventris Lovetsky, 1828*

Distribution. The Bastard sturgeon is widespread (excluding introductions) in the Caspian and Aral Seas, and much less so in the Black and Azov Seas. Compared to the Sea of Azov and the northwestern Black Sea, the Bastard sturgeon is even rarer in the eastern half of the Black Sea, where it is currently found only in Georgian waters.

Size-weight and age. The maximum length of the wrasse reaches 221 cm, and the weight is 60 kg. The length of the producers is more than 90 cm, and the weight is more than 10 kg. The maximum recorded age is 33 years. The largest specimen in Georgian waters was caught in 1965, in the lower reaches of the Rioni River, with a total length of 122.5 cm, weight 9 kg, age 15 years, sex - female.

Faunal complex. Ponto-Caspian endemic (relict).

Biotope and relationship to abiotic environmental factors. Tolerates fresh waters and up to 14 ‰ brackish areas of the sea. Occurs at 2-21°C, stops feeding at temperatures below 8 °C, hibernates at 15-25 °C. Occurs in the seas to a depth of 50 meters, mainly at a depth of 11-25 meters. Tolerates sandy, sandy-silty, silty and shelly soils. Occurs mainly in conditions of oxygen saturation in water above 60%.

Biology. Juveniles feed on benthos, sexually mature forms on fish and benthos. During spawning, anadromous migrations (upstream and downstream (rolling)) and wintering (temperatures below 8 °C), feeding stops. It rises to the river for spawning in March-April, less often in May. Spawns at a temperature of 15-25 °C, in May-June. The intervals between spawnings are usually 2-3 years. Fecundity is from 100 thousand to 1 million eggs, with an average of 440 thousand eggs. Males become sexually mature at the age of 6 years, and females at the age of 8 years. In the sea, it is found near the bottom and in the bottom edge layer.

1.4.2. Atlantic sturgeon - Acipenser sturio Linnaeus, 1758

Distribution. The wrasse is distributed along the Atlantic coast from Morocco to Norway, in the basins of the Baltic, Mediterranean and Black Seas. Georgian waters represent the easternmost point of the wrasse distribution, the farthest point from the distribution core.

Size-weight and age. The maximum length of the wrasse reaches 6 m, and the weight is up to 400 kg, the maximum recorded age is 100 years. The largest specimen in Georgian waters was found in Rioni, with a length of 215 cm, a weight of 68 kg, an age of 20 years, sex - female. In our waters, the minimum length at first maturity: males are 96 cm, females are 137 cm. The minimum weight at first maturity: males are 10 kg, females are 15 kg.

Faunal complex. Boreo-Atlantic relic.

Biotope and relationship to abiotic environmental factors. Tolerates high sea salinity up to 38 ‰. Occurs at 6-25 °C, stops feeding at temperatures below 8°C, hibernates at 13-20°C. Occurs in the seas to a depth of 80 meters, mainly at a depth of 10-55 meters. Tolerates sandy and sandy-silty soils. Occurs mainly in conditions of oxygen saturation in water above 60%.

Biology. Juveniles feed on benthos and fish, adults on fish (ichthyophagous). During spawning, anadromous migrations (upstream and downstream (rolling)) and wintering (temperatures below 8 °C), feeding ceases. It rises to the river to spawn in March-April, less often in May. It spawns at a temperature of 13-20 °C, in April-May, less often in June. The intervals between spawnings are usually 2-3 years. Fecundity is from 700 thousand to 2.4 million eggs, with an average of 1.2 million eggs. Males become sexually mature at 7-9 years of age, and females at 11 years of age. In the sea, it is found near the bottom and in the bottom layer, although unlike the scaly sturgeon and the Colchian sturgeon, it is also found in the water column.

1.4.3. Starry sturgeon - Acipenser stellatus Pallas, 1771

Intraspecific forms. The Starry sturgeon is represented in the Caspian Sea by the typical form – A. stellatus stellatus Pallas, 1771, and as a subspecies in the Sea of Azov – A. stellatus donensis Lovetsky, 1834 and in the northwestern part of the Black Sea by A. stellatus ponticus Movchan, 1970. The intraspecific status of Starry sturgeon in Georgian waters has not been studied.

Distribution. Starry sturgeon is widespread (excluding introductions) in the Caspian, Black and Azov Sea basins. Very rare in the Bosphorus Strait, the Sea of Marmara and the Adriatic Sea.

Size-weight and age. The maximum length of the taragana reaches 218 cm, the maximum recorded age is 31 years. The largest specimen in Georgian waters was caught in 1981 with a length of 186 cm. Weight 16 kg. In our waters, the minimum length

At first maturity: males 110 cm, females 130 cm. Minimum weight at first maturity: males 5 kg, females 6 kg.

Faunal complex. Ponto-Caspian endemic (relict).

Biotope and relationship to abiotic environmental factors. The most euryhaline and It is a thermophilic form, adapted to humidity up to 22‰ and temperatures up to 30°C. In waters with. It stops feeding at temperatures below 10 °C, and hibernates at temperatures between 13 and 26 °C. In the seas, it occurs at depths of 5-80 meters, mainly 10-45 meters. At depth. Tolerates sandy, sandy-silty, silty, and silty soils. Occurs predominantly in water with oxygen saturation above 60%. Under the conditions.

Biology. Juveniles feed on benthos, mature forms mainly on benthos and to a lesser extent on bottom fish. During spawning, anadromous migrations (upstream and downstream (rolling)) and wintering (temperatures below 10°C), feeding stops. It rises to the river in May-June, rarely in July, spawns at temperatures of 13-26°C in June-July. The intervals between spawnings are usually 2-3 years. Fecundity is from 50 thousand to 1 million eggs, with an average of 210 thousand eggs. Males become sexually mature at the age of 6 years, and females at the age of 7 years.

1.4.4. Colchian sturgeon, Colchian sturgeon - Acipenser persicus colchicus Marti, 1940

Intraspecific forms. Typical form is present in the Caspian Sea basin.

Distribution . The Colchian sturgeon is distributed in the eastern and southeastern parts of the Black Sea. Its typical form, the Persian sturgeon, is found in the Caspian Sea basin.

Size-weight And Age . Persian Sturgeon Maximum Length reaches 242 cm , weight 70 kg , maximum Fixed Age 34 years . Georgia In the waters Colchian Sturgeon Most Large Copy The length (1975-1986) was 178 cm . In our In the waters Minimum Length First At maturity : males 97 cm , females 114 cm . Minimum Weight First At maturity : males weigh 6 kg , females 9 kg .

Faunistic Complex . Ponto-Caspian Endemic (relict).

Biotope And Attitude Environment Abiotic with factors . It applies to up to 18‰ Simlash and temperatures up to 28°C Having In waters below 9°C. At temperature Food It stops , heats up at a temperature of 17-25°C. In the seas Suitable for 5-80 meters , preferably 10-45 meters At depth . It is tolerated. Sandy , sandy-silty , silty And Sink Grounds . We are Preferably In the water At 60% oxygen High Saturation Under the conditions .

Biology . Young adult Feeding Benthos , sex Forms Bottom With fish And Benthos . During the tophobium , anadromous During migrations (ascent) And On the descent (when sleeping)) and Wintering (below 10° C) Temperature (food) Decides . To be finished In the river Erects May Finally And In June-July , it is warm 17-25°C.

At temperature June-August . Tofobata Between Intervals Usually 2-3 years . Fertility On average 250 thousand Grain It is spawning . Sexually It is ripening. Male 7 years old From age , while Female 9 years old From age .

1.4.5. Russian sturgeon - Acipenser gueldenstaedtii Brandt & Ratzeburg, 1833

Intraspecific forms. The typical form (Russian sturgeon - Acipenser gueldenstaedtii Brandt & Ratzeburg, 1833) is present in the Caspian Sea basin.

Distribution. Russian sturgeon is widespread (excluding introductions) in the Sea of Azov, the Black Sea (mainly in the western and northeastern parts of the Black Sea), from where it enters rivers. Its typical form occurs in the Caspian Sea basin.

Size-weight and age. The maximum length of the typical form of Russian sturgeon reaches 236 cm, weight 115 kg, maximum recorded age is 46 years. The length of the largest specimen of Russian sturgeon caught in Georgian waters was 128.3 cm, and the weight was 14 kg. The minimum length at first maturity is 90 cm (5 kg) for males, 100 cm for females.

Faunal complex. Ponto-Caspian endemic (relict).

Biotope and relationship to abiotic environmental factors. Occurs in waters with a salinity of up to 16‰ (prefers waters with less salinity) and temperatures of up to 25°C. It stops feeding at temperatures below 8°C, hibernates at temperatures of 8-18°C. Occurs in the seas at depths of 5-80 meters, mainly 10-45 meters. It tolerates sandy, sandy-silty, silty and shelly soils. Occurs mainly in water with oxygen saturation above 60%, although it is tolerant of hypoxia.

Biology. Feeds on benthos. It stops feeding during spawning, anadromous migrations (upstream and downstream (rolling)) and wintering (temperatures below 10°C). It ascends the river to spawn in March-April, spawns at a temperature of 8-18°C in May-June. The intervals between spawnings are usually 3-4 years. The average fertility is 200 thousand eggs. Males become sexually mature at the age of 7, and females at the age of 9.

1.4.6. beluga sturgeon - Huso huso (Linnaeus, 1758)

Intraspecific forms. Sometimes the following subspecies are distinguished: Huso huso caspicus Babuschkin, 1942 - Caspian hop; H. huso maeoticus Salnikov et Maliatskij, 1934 - Azov hop; H. huso ponticus Salnikov et Maliatskij, 1934 - Black Sea beluga sturgeon.

Distribution. beluga sturgeon are widespread (excluding introductions) in the basins of the Azov, Black, Caspian, and Adriatic Seas.

Size, weight and age. The maximum length of the scaup reaches 8 m, weight up to 3.2 t., maximum recorded age is 118 years. The largest specimen of the scaup caught in Georgian waters was caught in 1984, in the Ochamchiri

headwaters, about 4 meters long, weighing 680 kg. The sex is female. This is one of the largest vertebrates caught in Georgia. There are 3 known cases (since the 90s of the last century) of the capture of scaup weighing more than 300 kg in Georgian waters, both in the Rioni River and in the coastal zone. The minimum length of the scaup at first maturity: males are 160 cm, females are 180 cm. The minimum weight at first maturity: males are 30 kg, females are 45 kg.

Faunal complex. Ponto-Caspian endemic (relict).

Biotope and relationship to abiotic environmental factors. Occurs in waters with a salinity of up to 18‰ and a temperature of 28°C. At temperatures below 8°C, it stops feeding, hibernates at a temperature of 15-25°C. In the seas, it occurs at a depth of 5-85 meters, sometimes deeper, mainly at a depth of 10-55 meters. It tolerates sandy, sandy-silty, silty and shelly soils. Occurs mainly in water with oxygen saturation higher than 60%.

Biology. The first year of life feeds on benthic invertebrates and fish, from the second year it is predatory - it feeds on fish. It stops feeding during anadromous migrations (upstream and downstream (rolling)) and during wintering (temperatures below 8°C). It ascends the river to spawn in March-May, spawns at a temperature of 15-25°C in April-June. The intervals between spawnings are usually 3-5 years. Fecundity is 500-900 thousand eggs per spawning, rarely more. Males become sexually mature at the age of 12, and females at the age of 15, rarely earlier.

2. Office research

2.1. Threats to fish and aquatic ecosystems during bridge construction.

2.1.1. Impact of bridge construction

One of the main threats to ichthyofauna during bridge construction is the disruption of the biological permeability of water flows. Bridges under construction can create obstacles to fish migration, which leads to losses of natural fish resources and a decrease in fish populations. In addition, obstacles can change the structure and functioning of aquatic ecosystems, which can negatively affect species diversity, including endangered and rare species.

However, modern bridge construction methods take into account measures to reduce the negative impact on ichthyofauna and aquatic ecosystems. For example, the use of specialized floating devices that allow fish to bypass obstacles caused by construction, or the installation of temporary (permanent) fish passage structures (these are special devices that allow maintaining acceptable water flow speeds and other environmental parameters for various fish species and create favorable conditions for fish movement.

In addition, studies are being conducted to identify optimal bridge design solutions to minimize the negative impacts of bridge construction on fish. Such solutions may include selecting the optimal location of the bridge, using new technologies and materials, and taking into account the key characteristics of aquatic ecosystems during the construction process.

Advantages of building bridges	Disadvantages of building bridges
Ensuring road safety	Violation of the biological conductivity of the water flow
Infrastructure development	Changing the structure and functioning of aquatic ecosystems
	Losses of fish populations
	Changes in the structure and functioning of aquatic ecosystems

In general, the impact of bridge construction on fish and aquatic ecosystems can be significant, but with the use of modern methods and technologies, its negative impact can be minimized. It remains important to continue research and develop new methods to preserve fish populations and biodiversity in general during bridge construction. Only in this way can a balance be achieved between infrastructure development and environmental protection.

2.1.2. Disruption of the natural flow of water

Disruption of the natural flow of water affects fish migration, preventing them from reaching their spawning grounds. Fish may encounter insurmountable barriers as they breed in the upper reaches of the river, which can lead to population declines and even the extinction of some species.

Water resources are essential for maintaining ecosystem balance and biodiversity. When the natural flow of water is disrupted, water shortages occur downstream, while water levels upstream may rise, which can cause temporary flooding of the banks, during which time large concentrations of juvenile fish can occur. The fall in water levels and the drying up of such ponds can lead to increased mortality of juvenile fish, which also negatively affects the natural environment. In addition, reverse currents can occur in riverbeds, which will lead to the entry of more polluted wastewater into the river and an increase in chemical pollutants that harm the aquatic ecosystem.

When constructing a bridge, potential problems associated with the disruption of natural water flow should be considered and measures should be taken to minimize their impact. This may include the creation of special channels for fish migration, or the use of construction methods and materials that do not prevent fish from reaching spawning grounds, as well as measures to manage wastewater and avoid excess water through the construction of drainage and watershed systems.

Only by adhering to environmental principles and using the latest technologies in bridge construction can we ensure the preservation of natural water flows and the protection of fish resources. Such construction will help minimize negative impacts on nature and create sustainable infrastructure, which should contribute to the balance of aquatic ecosystems.

2.1.3. Impact on fish migration

The construction of bridges has a significant impact on fish migration and their habitats. Bridges can create physical barriers to the free movement of fish in rivers and reservoirs.

One of the main problems associated with **bridge construction is the creation of barriers to fish migration. Bridges can block fish migration routes and restrict their movement. This can lead to reduced access to food resources, spawning grounds, and other important areas.**

Restricting fish migration can affect their life cycles and lead to population declines. Fish also need to migrate during their reproductive years, especially during seasonal changes. Restricting fish migration can lead to a decrease in food resources and a deterioration in the state of fish populations.

Another problem **during the construction of a bridge can be changes in the hydrological regime due to** the construction . The construction of a bridge can change the natural flow and regime of water in the river. This can lead to changes in water temperature, as well as changes in the concentration of oxygen and other chemicals. Such changes can negatively affect fish habitat and breeding conditions.

the negative impact of bridge construction on fish, it is necessary to use special techniques and measures. For example, under-bridge passageways can be used to ensure safe and unhindered fish migration. It is also important

to conduct research and impact assessments during bridge planning and construction, and to monitor the situation afterwards.

Considering the impact on fish migration during bridge construction contributes to the preservation of biodiversity and aquatic ecosystems. This is important for the conservation of fish resources and ensuring the sustainable use of water resources, and ultimately for the conservation of individual fish species and their populations.

2.1.4. Migration barriers

Natural Environment Transform it and Fish Migration Promotion For the purpose , it is important Special Fishing routes Arrangement . This Buildings Fish Allow gives To overcome Barriers that Hand It helps They Moving River Along And Multiplication In naturally formed meadows .

Advantages of fish passage structures	Type of fish passage structures
1. Ensure the preservation of aquatic biological diversity.	1. Mesh fences
2. Helps maintain migratory fish populations	2. Artificial barriers are present. With cavities.
3. Reduces the risk of their capture and destruction.	3. Fish ladders
4. Improves the ecological condition of the water flow.	4. Fish protection screens

Fish hatchery structures Construction is an integral part of bridge construction , which contributes to the protection of nature and the maintenance of balance in the aquatic ecosystem. This is an important step towards sustainable development and the preservation of biodiversity.

2.1.5. Impact on fish populations

Fish migration during spawning is an important part of their life cycle. They are probably looking for suitable places for tofu, with enough sandy or with a gravel bottom. These areas may be located upstream of the river, near a bridge away from the construction site.

However, when a bridge becomes an obstacle for fish, they are unable to reach suitable spawning grounds. This can lead to a decline in fish populations and disruption of the river ecosystem. Many fish species are important for maintaining biodiversity and replenishing populations . The population depends on migration.

In addition, bridge construction may alter the natural flow regime of the river and degrade fish habitats . Bridges may create shadows that affect water temperature and the growth of aquatic plants . This may negatively affect the development and survival of spawning and juvenile fish.

Overall, bridge construction can have serious impacts on fish populations and river ecosystems. Therefore, it is important to consider these factors when designing and constructing bridges to minimize negative impacts and maintain the biodiversity of aquatic ecosystems.

To minimize damage to fish and the environment during bridge construction, there are various actions that can help reduce negative impacts :

1. **Installation of fish protection screens:** These are special screens made of mesh or other materials that are installed on the sides of bridges under construction to prevent fish from entering the construction site.
2. **Temporary restrictions on construction work during certain periods:** Construction work restrictions may be imposed during periods of fish migration or spawning to prevent disruption of the fish life cycle.
3. **Monitoring of impacts on fish and the environment:** The state of fish populations and the impact of bridge construction on fish and the ecosystem are constantly monitored. If negative impacts are detected, appropriate measures are taken to reduce them.

By using the actions and tools described above, it is possible to reduce the negative impact of bridge construction on fish and the environment, ensuring the preservation of biodiversity and sustainable development.

3. Field studies

3.1. Research objectives and methods

Research objectives:

- Ichthyological research of the Rioni River (especially with regard to the sturgeon species),

  In particular:

  - ✓ Determination of fish species composition;
  - ✓ Determining the diversity of intraspecific structure and life strategies for fish species that are considered as target objects within the scope of the field study;
  - ✓ Determining the category of species (massive, rare, Red Book species);
  - ✓ Identification of indicator species for the state of river ecosystems;
  - ✓ Assessment of the status of species (abundance, spawning dates, body length and weight, age and sex);
  - ✓ Distribution and localization in areas defined by the river treaty;
  - ✓ Assessment of anthropogenic impacts, threats and sources of risks;

Field research methods:

Scientific processing of ichthyological materials can be carried out within the framework of faunistic or systematic research.

In the first case, the aim of the study is to determine the composition of the ichthyofauna of the reservoir in the area of the planned works. For this purpose, samples are scientifically determined using relevant reference manuals, followed by comparison with detailed descriptions in the literature.

Based on this processing of the received material, a list is compiled, which includes the scientific names of the specimens obtained, the location of the collected specimens, and biological and ecological data (based on personal observations or research information on the river study area). When identifying the collected specimens and comparing them with existing descriptions, it is possible to discover and note features of various significance - for example, features that introduce certain changes in the determination of the variational limits of certain characteristics.

It is also necessary to conduct a biometric study of the material using methods of variational statistics. This already represents processing for the purposes of systematic research. The study is carried out on the basis of a number of characteristics and is accompanied by numerous measurements, the results of which are entered into tables and then used to calculate indices and draw variational series and curves.

Characteristics suitable for biometric processing can be divided into two groups: measurable and countable (number of scales, fin rays, vertebrae, etc.) and plastic characteristics (ratio of sizes of different body parts).

Measurements are made using a caliper or a sharp-tipped ordinary ruler . In the latter case, the size is determined by placing the arrows of the ruler on a millimeter ruler . Linear measurements are expressed in whole millimeters. All measurements are made on the left side of the fish.

Field research methods

Visual inspection of the research area

Implemented Habitats Visual Identify what meant Every Species Typical Habitat Definition (typical) Habitat Hypsometry, general Hydrology, relief, soil, landscape-visual characteristics), what Also on the basis was happening Facial Composition Virtual Identification River That On sections (visual audit), where Ceiling No It was Conducted, last in the past Using this method Total More Intensely Implanted the World Many In the state.

Methods for studying the number and distribution of fish

The issue of the number and distribution of fish in a water body has been a major issue facing experts. Currently, there is a wide arsenal of methods for determining the absolute and relative abundance of fish and calculating ichthyomyces for different types of water bodies, but none of them is 100% accurate.

The methodological approaches currently used to determine fish abundance can be divided into two groups:

1. of volume or area. Methods for direct counting of fish numbers .
2. Computational-analytical methods for population modeling

Experts have used a direct counting method of the number of fish per unit area, which involves catching juvenile or adult fish per unit area with a set net whose catch coefficient is known.

The use of this method of accounting requires its adaptation to the conditions of a given water body (for example, it is necessary to determine the coefficients of mesh tightness specifically for a given water body). In addition, the use of this method to achieve the accuracy of assessing fish abundance requires some experience in conducting studies on a water body (Rioni River) in order to take into account the seasonality and biotope characteristics of the distribution of aquatic organisms.

The main drawback of this method for determining the number of fish in a water body is that it can be used only in strictly defined ecological situations (for example, under the conditions of using all direct counting methods), or when the condition is allowed that the method is generally applicable, but inaccurate. Based on these assumptions and risks, the number of fish in the specified section of the Rioni River was calculated by experts according to the following methodological document: Methodological instructions for estimating the number of fish in freshwater bodies / All-Union Scientific-Production Association of Fish Farming, All-Union Research Institute of Pond Fisheries. Moscow, 1990. («Методические указания по отсене численности рыб в пресноводных водоемах» / All-Union Scientific-Production Association of Fish Farming, VNII of Pond Fisheries. Moscow, 1990)

Methods for studying the structure of resident fish

When assessing the impact of human economic activity on aquatic organisms, the structure of fish inhabiting the water body in the area of impact of economic activity is analyzed.

For this purpose, control fishing is carried out using various types of fishing gear: set nets and drift nets, trap nets, fish traps, crab traps, gillnets and fishing hooks. The use of a specific fishing gear is determined by the morphological features of the water body. For example, on a medium-sized river (Rioni River), it is advisable to use a set net drift net. The net should be at least 25 meters long (the longer the net, the wider the river research area), fish traps, crab traps, gillnets and cast nets are also used. When conducting control catches, it is important to fish in biotope-diverse areas of the water body - deep water streams, shallow coastal waters, riverbed bends, pits, bays and channels. The result of catching with each weapon is registered separately (the number of specimens of each species and the total weight of all caught fish of this species), the duration of fishing (for a specific weapon) or the fishing area (in the case of using active fishing gear) is necessarily registered.

To determine the structure of the fish population residing in a specific water body, the following data is entered into the registration log:

— Name of the water body;

— Date (period) of the work;

— Morphological characteristics of the water body;

— Weather characteristics (including atmospheric pressure);

— A diagram of the water body (or its studied section) indicating the location of fixed fishing gear and the area of water covered by active fishing gear (it is desirable to indicate coordinates);

— Duration of fishing with each fishing gear (start and end time);

— Catch data for each fishing gear, indicating the number and weight of each recorded fish species. After the control fishery, the data for each recorded fish species are re-recorded taking into account the duration of exposure to the set net and the area of the active driftnet fishing area.

A logarithmic scale can be used to estimate the relative abundance of each fish species: rare – <0.1%, small – 0.1–1.0%, common – 1.1–5.0%, subdominant – 5.1–10.0%, dominant – >10%, superdominant – >50%. (Calculated from the total number and/or biomass of fish caught.

It should be noted that control fishing allows only to assess the structure of fish habitat in a particular water body (and recorded during control fishing). Data from literature and local fishermen are also important in determining the species composition of the ichthyofauna of a water body.

Methods for studying fish population structure

Determining the spatial structure of populations of individual fish species allows us to formulate rational strategies for developing effective conservation programs for their stocks, taking into account the distribution of subspecies, subpopulations, and stocks in general.

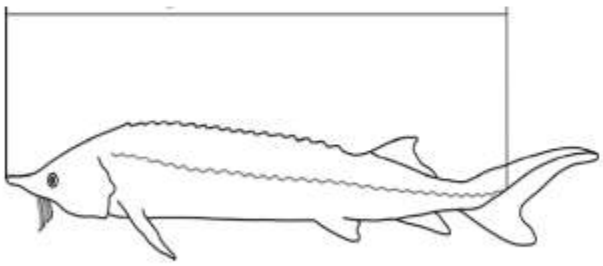
Traditionally, the variation of morphological characters has been used to analyze the structure of fish populations. Methods of morphological analysis are well developed; there are both general indicators for all species, and specific characteristics for fish of different taxonomic groups.

Morphological analysis uses plastic signs (measurable: body, head, fin size and distance between fins) and meristic signs (countable: number of lateral line scales, fin rays, spines, gills and pyloric appendages). To reduce the influence of age-related variability on the indicators of plastic signs, which is due to the fact that fish grow throughout their lives, they are evaluated not in absolute values, but in comparison with the base indicator. An index is calculated: the base length is taken as 100% and the percentage of the studied sign relative to the base indicator is determined. Most often, the body length of the fish (from the beginning of the gill cover to the end of the gill cover - the length of the gills) is used as the base indicator. In the case of salmonids, the body length according to Smith (from the beginning of the gill cover to the end of the middle rays of the caudal fin) is used as the base indicator.

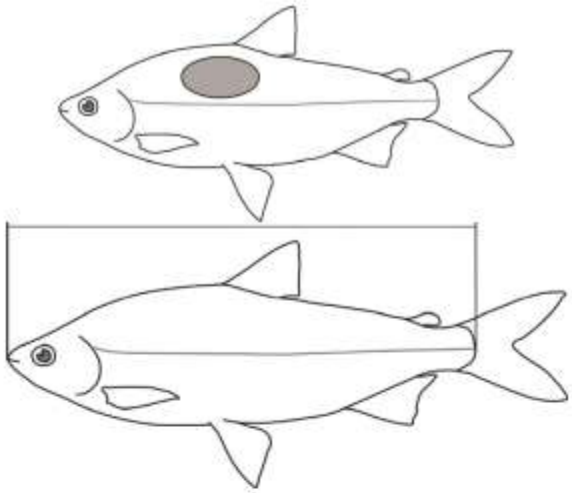
Methods for studying the age and growth of fish

Fish age and growth data are widely used to assess the state of fish stocks. Age and growth data allow us to assess population stability, underexploitation or, conversely, overexploitation of aquatic biological resources.

The age of fish can be determined by their scales, bones, and otoliths—the structural features of which reflect the fish's uneven growth rate throughout the year and have characteristic annual arcs. Before sampling to determine age, the fish is weighed and its fin length is determined.



Measuring the length of the spines in sturgeon fish.



Measurement of gill length in cyprinids and salmonids.

The best place to remove scales from a fish's body

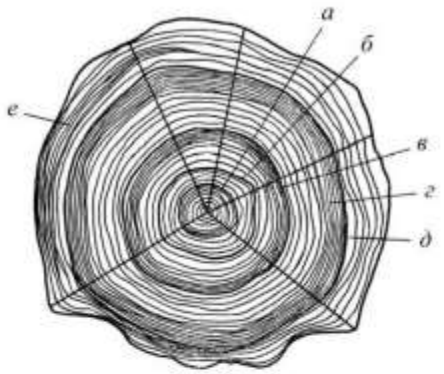
Measurements are made using calipers, measuring tape, rulers, or, when conducting mass measurements of relatively large fish, where the acceptable measurement accuracy is 0.5 cm, it is convenient to use a measuring board.

age and growth characteristics, at least 10 scales are taken from each fish, usually from the mid-body, above the lateral line. If the fish does not have scales in this location, samples are taken wherever possible.

It is important to make sure that the sample does not contain scales from other fish. To do this, we ensure the cleanliness of the workplace. Scales are collected using a blunt scalpel or tweezers. The collected scales, with their own mucus, are glued to the right edge of the sheet of the "scale book" (scale sampling notebook). On the free left side of the sheet, the fish species, place and date of collection, sample number, sex of the fish, total weight (Q, g), total length (L, cm) and total length (l, cm) are written. The "scale book" is usually kept separately for each species of fish studied. The title page of the "scale book" indicates the type of fish, place and period of collection, as well as the method of capture. If the fish does not have scales or is small, we use the bones that form layers during growth to determine the age of the fish. These are the bones of the gill cover (usually the operculum), the shoulder girdle, the skull, the bones of the body vertebrae and the rays of the fins. Small bones are preserved like scales, while large bones are labeled or placed in labeled envelopes.

Otoliths are another method used to determine the age of fish. Otoliths are removed from the auditory capsule with tweezers: in small fish, by making a transverse incision in the occipital region from above; in large fish, by cutting out the flaps from below in the intercostal space and opening the underside of the skull.

Age determination is usually done in a laboratory. Before examining the scales, it is advisable to wash them in a weak solution of Nishaduri. This is done to remove the epidermis. After that, 5-7 scales are fixed between two glasses and the number of annual rings is counted.



Scale pattern of a three-year-old fish

а , in , б – Annual arcs ; б, г, е – additional arcs

Ageing of fish

Name of the age group	Material collection time	Number of annual arcs	Age designation
This year's	Autumn	0	0+
One summer spent	Spring	1	1
Two summers spent	Autumn	1	1+
Two-year-olds	Spring	2	2
Three summers spent	Autumn	2	2+
Three-year-olds	Spring	3	3
Four summers spent	Autumn	3	3+
Four-year-olds	Spring	4	4
Five summers spent	Autumn	4	4+

4. Field research results

Assessment of species diversity of the Rioni River ichthyofauna at the control points provided for by the agreement.

According to the agreement, a total of two control points were envisaged on the Rioni River:

First point

The first point is located in the following area:

42°11'56"N 41°39'44"E,

42°11'56"N 41°39'42"E,

42°11'52"N 41°39'42"E,

42°11'52"N 41°39'43"E;

Second point

The second point is located in the following area:
42°11'30"N 41°42'04"E,
42°11'31"N 41°42'02"E,
42°11'24"N 41°41'55"E,
42°11'23"N 41°41'56"E.

"AquaGe" LLC duly fulfilled all obligations under the contract:

- Obtained all necessary permits to conduct the research;
- The research was conducted in accordance with the permits issued by the LEPL Agency for Protected Areas and the Ministry of Environmental Protection and Agriculture of Georgia ;
- Corresponded with "Georgian Ameliortion" LTD to close the gates of the regulating hydrotechnical structure on the Rioni River at the entrance to the city of Poti;
- The Environmental Supervision Service was informed about the control fishing. A representative of the said agency was present at the fishing process and acts related to the fishing process were signed;
- A fishing journal was produced for scientific research purposes and submitted to the relevant agency under the Ministry of Environmental Protection and Agriculture (Environmental Supervision Agency).

Scientific research For the purpose Fishing I must to be held May 15 - June 15, 2025 Calendar During the period . The start of scientific-research fishing is planned from June 6, 2025.

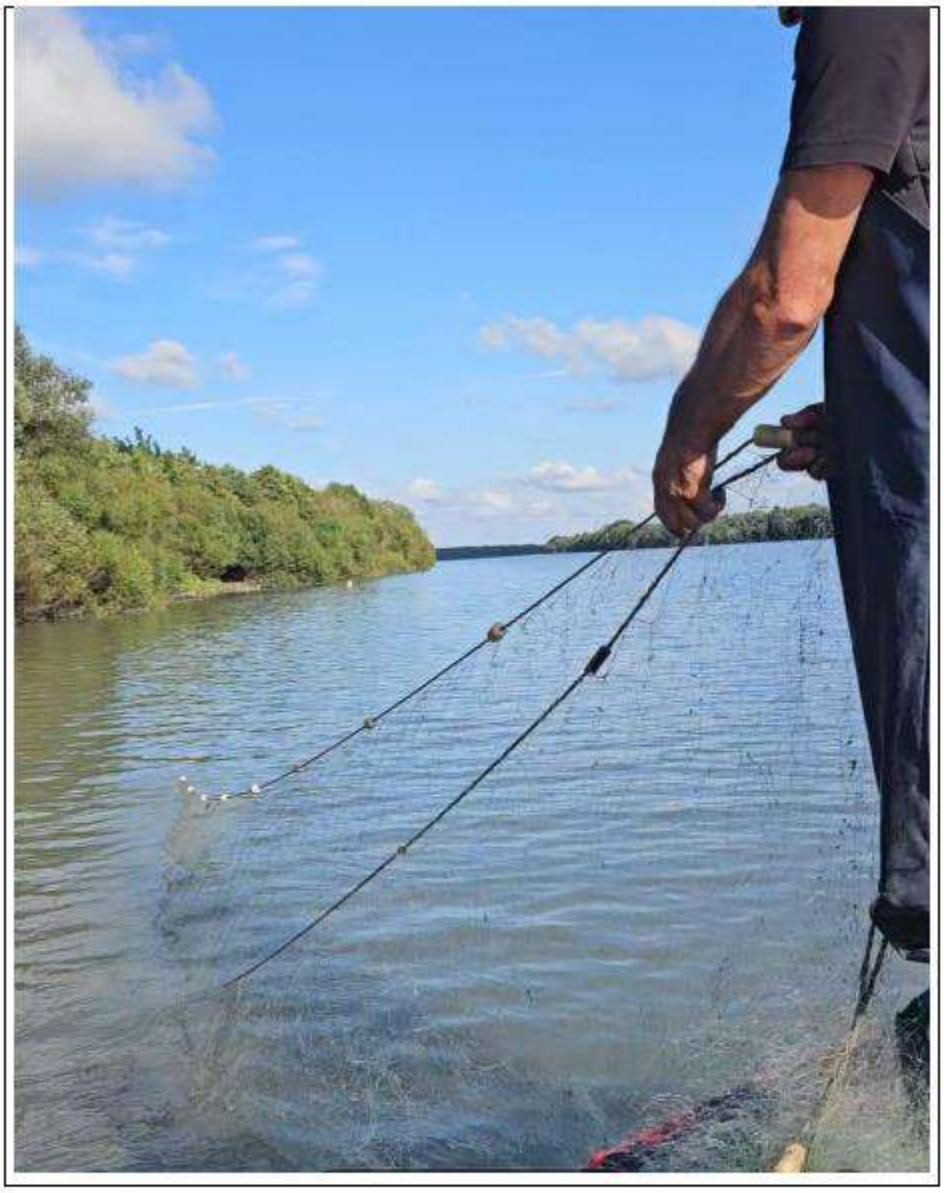
Since the issue of water regulation on the Rioni River is carried out by Georgian Amelioration LTD , AquaGe LLC requested Georgian Amelioration LTD to close the gates of the water regulation structure (the so-called Northern Dam) on the Rioni River for 2-3 hours during the specified period, on one specific day, which would make it possible

to set fishing nets in the designated area of the Rioni River. Georgian Amelioration LTD explained that due to the flood, the complete closure of the gates was high-risk and could not be implemented.

It was proposed to implement control ceilings in the river during the flood period, which created some difficulty, as the proposed period (August - September) did not coincide with the migration period of anadromous fish in the river. Nevertheless, LLC " AquaGe " has requested the Ministry of Environment Protection and Agriculture of Georgia to extend the fishing period for scientific research purposes. According to the letter of the Ministry of Environment Protection and Agriculture of Georgia dated June 25, 2025 No. 4780/01, the fishing period was extended until the end of September 2025.

Fishing for scientific research purposes was carried out on the Rioni River on September 10-11 of this year. All interested parties, including representatives of the environmental supervision, were present at the fishing process.

A total of 40 fish of 10 different species were caught during the scientific fishing. It is noteworthy that none of the caught fish were Red List species.



Diversity of ichthyofauna identified during scientific fishing on the Rioni River

No.	Scientific Name	Georgian name	English name	Logarithmic scale of abundance
1.	Perch fluviatilis	ქორჭილა	Common perch	Common
2.	Vimba vimba	ვიმბა	Vimba	Dominant
3.	Ctenopharyngodon idella	თეთრი ამური	Grass carp	Introduced into wetlands for aquaculture purposes
4.	Abramis brama	კაპარჭინა	Common bream	Common
5.	Scardinius erythrophthalmus	წარფლეთევლა	Common rudd	Dominant
6.	Mugil cephalus	კეფალი	Flathead gray mullet	Dominant
7.	Silurus glanis	ლოქო	Welsh catfish	Common
8.	Cyprinus carpio	კობრი	Common carp	Common
9.	Esox lucius	ქარიყლაპია	Northern pike	Common
10.	Carassius carassius	კარჩხანა	Carassius	Invasive form

Obtained Copies Quantity Control points According to		
Species	Checkpoints	
	1	2
Common perch	-	1 piece
Vimba	-	8 pieces
Grass carp	-	1 piece
Common bream	-	1 piece
Common rudd	-	5 pieces
Flathead gray mullet	-	7 pieces
Welsh catfish	-	2 pieces
Common carp	-	2 pieces
Northern pike	-	1 piece
Carassius	-	1 piece

Analyzed structure of the ceiling

Checkpoint 1				
Species	Length (TL/cm.)	Weight (g)	Age	Gender
Common perch	No fish were caught during the control fishing.			
Vimba				
Grass carp				
Common bream				
Common rudd				
Flathead gray mullet				
Welsh catfish				
Common carp				
Northern pike				
Carassius				

Checkpoint 1				
Species	Length (TL/cm.)	Weight (g)	Age	Gender
Common perch	13 cm	107 .4	+2	♀♂
Vimba	10-12-13-17-18-18 -20-21 cm	61.4 – 73.6 – 79.8 – 104.3 – 110.4 - 112.5- 122.7 – 129.0	+1; +1;+1; 2; 2;+2;+2;+2;	♂ - ♂ - ♀ - ♀ - ♂ - ♀ - ♀ - ♀
Grass carp	18 cm	84.3	1 ;	♀
Common bream	17 cm	94.2	+1	♂
Common rudd	12-12-15-17-17 cm	6 3 . 5 – 69 .6 – 7 7 . 3 – 74.4	1; 1; 1; +1; +1;	♂ ♂ ♂ ♂ ♀
Flathead gray mullet	20- 23-25-28 – 33-33-35 cm	127.4 – 132.3 – 128.4 – 135.4 – 133.7 -135.3 – 142.3	+1; +1; 2; 2; +2; +2; +2	♀ ♀ ♀ ♂ ♀ ♀ ♀

Welsh catfish	23 -27cm	267.5	2	♀
Common carp	24 -27cm	177.5 – 182.3	+1; +1	♀ ♀
Northern pike	22 cm	211.2	2	♂
Carassius	17 cm	68.7	1	?

Sexual structure of species obtained during control sampling,

Ovulation periods, fertility, and age of puberty

Species	Age of puberty	The period of tofu (month)	Average individual fertility
Common perch	At the age of 2 – 3 years	March - April	12 – 900 thousand
Vimba	At the age of 2 – 3 years	From April to the end of July	Up to 22 thousand eggs
Grass carp	From 4 years old	From April to August	100 – 816 thousand eggs
Common bream	From 2 – 3 years old	From April to June	34800 – 107500 to spawn
Common rudd	From 3 years old	From the end of April to mid-July	Up to 158 thousand eggs
Flathead gray mullet	At the age of 2 – 3 years	From May to September in the Black Sea	2 – 8 million pieces
Welsh catfish	At the age of 3 – 4	From May to August	11 – up to 500 thousand pieces
Common carp	4 years old	From April to September	96 – 1810 thousand eggs
Northern pike	3 – 4 years old	From March to June	3 – 215 thousand eggs
Carassius	At the age of 4	Many times from April to September	300 thousand

Nutritional characteristics of fish species caught at control points

Species	Food fraction	Fertilization period (months)
Common perch	In the first year, it feeds on zooplankton, from the second year on benthos, and at the same age it begins to feed on small fish.	Feeds all year round
Vimba	Mainly with benthos and algae	From the end of May to the beginning of October
Grass carp	With aquatic plants, grass, tree leaves, small fish, worms, insects	From the beginning of June to the end of September
Common bream	Lifts: With plankton Adult: Benthos, chironomids, ciliates, worms of springtails and needletails	From the end of May to the end of September
Common rudd	Phytoplankton, algae, worms, crabs, barnacles, insects, water butterflies, fish eggs, snails	From the end of May to the end of August
Flathead gray mullet	Feeds on organic matter formed on mud and rocks and sand Lipsites feed on detritus and plankton.	From April to early October
Welsh catfish	Lifts: With water insects, Adult fish: With small fish, Adult fish:	From April to mid-October

	Fish, frogs, birds floating on water, land animals entering the water	
Common carp	Lipsit: Zooplankton In adulthood: Benthic organisms, benthos, algae	From the beginning of June to the end of September
Northern pike	Lifts: Zooplankton, benthos Juvenile and adult fish: predatory feeding	From the end of March to the beginning of October
Carassius	Lifts: With plankton Adults: Omnivorous	From April to the end of September

Determining the number of fish in the Rioni River estuary

The method chosen by the experts is developed by analogy with the area method. The method assumes that the number of fish passing through the river during the entire fishing period is related to the number of fish caught during the survey, just as the total time of passage of the fish is related to the fishing time, the catch coefficient of the fishing gear, and the width of the net in relation to the width of the river. The equation takes the following form:

$$N = Tn/ tkl$$

Where:

N - number of fish; n - number of fish during the control catch; T - total time of fish catch; t - total time of net setting during a successful control catch; k - catch coefficient of fishing gear ; l - ratio of river diameter to the proportion of riverbed obstruction by fishing gear;

According to fishing regulations, the proportion of the river diameter blocked by the net to the total river diameter should not exceed 2/3 of the river width, and in such a situation, l = 0.66.

The coefficient of tightness of the mesh to be installed was determined as k=0.6 as a result of the research.

Based on all of the above, we obtain the following result:

The fraction of a river's diameter that	T, minutes	t, minutes	n, copy	Weapon accuracy coefficient	Total number of fish, pieces

is covered by a net					
0.66	960	180	40	0.6	539

Conclusion : During the period of control ceilings, a total of 539 fish specimens were recorded at both given control points under total ceilings.

Common Perch – Perca fluviatilis Pallas 1811

I_D XIII-XIV, II_D I-III 13-14, A II 7-10, LL 56-77.

The body is tall, flattened from the sides and covered with small scales. It has several rows of small teeth on the jaws, and the cheeks are covered with scales. It has two dorsal fins, the first of which has unbranched rays, and the second is both unbranched and branched. The body is greenish-yellow, with 7-8 black stripes on the sides. The second fin is greenish-yellow, the pectoral fin is yellow, and the rest are red. Length up to 52 cm, weight up to 5 kg. It is a freshwater fish, feeds on zooplankton in the first year, and on benthos from the second year, especially chironomids, daylilies, and ruissellidae, and from the same age it begins to feed on small fish. It becomes sexually mature at 2-3 years old. It reproduces in March - April. The number of eggs is 12-900 thousand (in large fish). The eggs are laid in a band that wraps around plants. The larvae hatch at water temperatures of 16-20 °C.

Vimba – Vimba vimba tenella Nordmann-1840

D III 7 – 9, A III 15 – 19, LL 48 – 58, Lakuchi sticks 12–18.

The mouth is lower, crescent-shaped. It has a well-developed gill slit between the dorsal and caudal fins. It has a pronounced ridge, small protrusions on the dorsal and caudal fins. During breeding, males arch their backs, their abdomen is brownish-pink. The pectoral, pelvic and anal fins are reddish. The body length reaches 220 mm, and the weight reaches 135 g. It tolerates brackish areas. The growth rate mainly depends on the conditions of the living environment, it feeds on benthos and algae; matures at the age of 2-3 years. It reproduces in April-July. It spawns several times; fecundity 20

It reaches up to a thousand; the spawn is sticky.

Common bream – Abramis brama (Linné 1758)

D III (8) 9—10; A III (22) 23-28 (29). Lakuchi sticks on the first arc 19—24-0

It is a semi-passage fish. The local form is widespread in the rivers of Colchis: Supsa, Rioni, Khobi, Churia, Pichori, Enguri, Tikhori, as well as in the lakes: Paliastomi, Shavnabada, Bebesiri. For habitation, it mostly chooses the lower reaches of the mentioned rivers, rich in plants, as well as the brackish areas of the sea.

It is characterized by a narrow, laterally flattened and high body (the height of the body reaches almost 1/3 of the length). The mouth is small, semi-lower. Behind the pelvic fins there is a ridge not covered with scales. The anal fin is somewhat long. The body and pectoral fins are grayish, the ends of the rest are black. It belongs to the caravan type of fish. It unites in a caravan of one hundred individuals and moves throughout the reservoir throughout the day. It hibernates in burrows, where it gathers in large numbers. It lives up to 20 years. The body length is 45 cm, rarely 75 cm. The mass is up to 6 kg and more. It reaches sexual maturity from the age of 3 years. It breeds in late March-April (according to other sources - from April to July) in shallow, algae-rich areas, at a water temperature of +12...+130C. During this period, males develop a white rash, which disappears after spawning. The fecundity reaches 90-700 thousand eggs, the diameter of which is 1-1.5 mm; the eggs are sticky, their development lasts 6 days and nights at a water temperature of +200C. The length of the newly hatched fry reaches 4.2-4.4 mm. They are also artificially propagated. They feed mainly on crustaceans, worms, snails, insect larvae, mostly chironomids, as well as algae. The juveniles feed on zooplankton.

Flathead grey mullet Mugil cephalus (Linnaeus, 1758)

It is very similar in appearance to other mullets. The main difference is the well-developed fatty eyelid, which partially covers the eye in front and behind. At the same time, it has a relatively large head and a well-developed axillary plate near the pectoral fin.

It grows to a relatively large size, reaching a length of up to 1 m and a mass of up to 12 kg. In the Black Sea, it is found no more than 50 cm. It is widespread in tropical and subtropical waters of all oceans, as well as in the Mediterranean, Azov and Black Seas. It enters bays and estuaries, in Georgia - in Lake Paliastomi and in the estuarine spaces of rivers,

It does not breed in the Sea of Azov. It spawns in the Black Sea from the end of May to the end of August. Fecundity is from 2.9 million to 7.2 million eggs. Spawning is portioned. The spawning is floating pelagic. Spawning takes place in the coastal strip of the sea. One female and 7-8 males participate in reproduction. The eggs mature simultaneously, they are round, spherical in shape, 0.7 mm in diameter. Loban is a fast fish and easily escapes nets by jumping out of the water. It can live in a wide range of temperatures and especially salinity. The lethal temperature range is 1-380C. It can tolerate record salinity levels of -75-830/00. The lypsita feeds on mollusk larvae, while adult fish feed mainly on detritus and plant growths, which they "scrape" from bottom stones. The role of algae in its diet is insignificant. The lypsita of the mullet is actively consumed by predatory fish, and adults are eaten by catfish and dolphins. The mullet chooses estuaries, bays and ports for wintering. It enters the estuaries and lower reaches of rivers, as well as coastal ponds, Lake Paliastomi, and winters in the rivers - Maltakva and Kaparcha. It is an object of commercial importance, but is numerically smaller than the golden mullet. It is one of the prominent commercial fish of Lake Paliastomi. It is an important object of coastal fishing and sport-amateur fishing. It is caught with drift nets, trap fish traps.

Wels catfish – Silurus glanis Linnaeus, 1758

D 3 – 5, A 77 – 94, Lakuchi sticks 11–15, mallets 71–75.

The body is elongated and slender. The mouth is large and armed with teeth. The body color is variable and depends on the location; mainly the dorsal side is green, the ventral side is white. It has irregular spots on the sides. The odd fins are dark, and a yellowish stripe runs along the paired fins. The iris is yellowish and covered with black spots. There is one pair of long whiskers on the upper jaw, and two pairs of short ones on the lower jaw. The body is up to 5 m long, weighing up to 300 kg. In nature, it is found in much smaller sizes. It is a semi-passerine fish.

It adapts to lake conditions, tolerates deep muddy places in rivers; in winter it hibernates in deep pits. It becomes sexually mature at the age of 3–4 years and its fertility reaches 10–500 thousand eggs. The length of newly hatched

larvae is 7 mm. They attach to aquatic plants and develop there. The length of a three-month-old catfish reaches 11–15 cm.

Common Carp - Cyprinus carpio (Linne, 1758)

D III-IV (16)17-22, A (II) III 4-5 (6)

(Formula of fin rays). Lateral row 32-41 scales. Jaw teeth 21-29. Pharyngeal teeth three-rowed: 1.1.3-3.1.1, rarely 1.2.3-3.2.1. Vertebrae 36-38.

The body is tall, covered with large scales, the outer On the side - with a black arch. The mouth is small, directed downwards, with two pairs of short With a mustache. The dorsal fin begins in front of the vertical of the pelvic fins. The coloration is variable. The back and fins are dark, the sides - Yellowish-golden. The caudal fin is reddish. The length reaches 1 m, the mass is up to 16 kg, rarely - up to 32 kg. Usually found in relatively Small in size. Lives up to 30 years. Grows intensively until 7-8 years of age.

Acclimatized from the Amur River and widely distributed in the inland waters of Eurasia. It is found in the inland reservoirs of Georgia. It is found in the following rivers of Georgia: Mtkvari, Alazani, Iori, Chorokhi, Supsa, Rioni, Khobi, Jumi, Churia, Tikhori, Enguri, Kodori and others; in lakes: Jandara, Paravani, Yeke, Paliastomi, Bebesiri, Tabatskuri and others. Also, in reservoirs and ponds. It is a freshwater fish, mostly limnophilous. It chooses brackish rivers and lakes. It is also found in brackish areas of the seas; it chooses areas rich in plants. In western Georgia it is a semi-passing form. Sexual dimorphism is not clearly expressed. Sexual maturity is reached at the age of 3-5 years, when reaching a length of 30 cm, rarely in the second year. Males mature relatively early. They begin spawning from April when the temperature reaches 16°C. They spawn at a depth of up to 0.5 m in areas of water bodies rich in plants. Fecundity is from 96 thousand to 1.8 million. The eggs are yellowish in color, 1.4-1.5 mm in diameter, stick

to plants. The incubation period is 3-7 days, depending on the temperature. The hatched larvae are initially attached to plants and feed on the yolk, and later move away from them and begin to actively feed on zooplankton. Carp is euryphagous - it feeds on both animal and plant food. The food spectrum largely depends on the availability of food. Juveniles feed mainly on zooplankton, and later on benthic. The diet of adult fish is seasonal. In spring, carp feeds mainly on vegetation and, in part, on the spawn of early-maturing fish. In summer, vegetation makes up a small share of the diet, while the main food is: insects, worms, crustaceans, snails, etc. In autumn, it completely switches to feeding on animal food. In the high-mountain oligotrophic lakes: In Paravan and Tabatskuri, under different vegetation periods, carp forms with different plastic and biological specificities, but this is only an ecological difference and cannot be a species identifier, therefore, the separation of these forms into species is erroneous. Carp is a valuable object of pond fishing. It is characterized by rapid growth and high productivity. The best pond breeds have been bred from it, of which the mirror carp was the main object of pond farming in Georgia. They are caught mainly with drinking and gillnets. Currently, the number of wild carp in natural reservoirs has greatly decreased.

Northern pike – Esox lucius Linnaeus, 1758 .

D VII-X 15-16, A III-VIII 10-16

The body is elongated, the head is large and long, with a flattened snout, the mouth is large and makes up half the length of the head. The dorsal fin is located quite far back. It has teeth. The lateral line is complete, but in adults it is sometimes interrupted.

The body is greenish-gray, yellowish-gray or brownish-gray; the back is darker, and the sides are lighter in color, with black or reddish spots. The length is up to 1–1.5 m, and the weight reaches 15–24 kg, but is usually smaller. It lives in riverine wetlands, feeds on fish, amphibians and other animal organisms. It becomes sexually mature at the age of 4 years. Spawns in March–April.

Carassius, Carassius gibelio (Bloch, 1782)

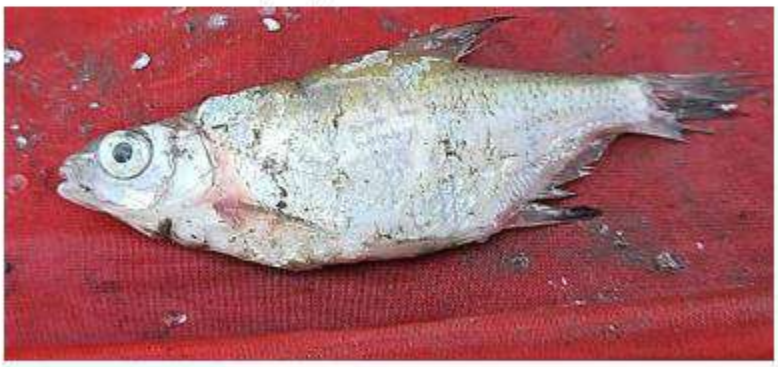
D III-IV 14-19, A II-III 5-6. There are 28-34 rows of scales in the lateral line. The gill rakers are long, 39-50, often 43-50. The pharyngeal teeth are single-rowed, 4-4. The vertebrae are 29-33, often 29-30.

The body is tall, covered with short silvery scales. The color is dark on the back, silvery on the sides, and dark on the belly. It is front-faced. Unlike the golden wrasse, it has a long dorsal fin, large scales, relatively numerous scale rows, and vertebrae. It lives 14-15 years, usually 7-10 years. It reaches a length of up to 45 cm and a weight of up to 1 kg.

One of the most widespread species of freshwater fish. It is found in temperate and cold inland waters throughout the Eurasian continent. In Georgia, it is distributed in practically all lakes and small ponds, as well as in the lower reaches of rivers. Unlike the golden carp, it prefers large ponds and slow-flowing rivers. It is a freshwater limnophilous fish. It adapts well to low oxygen saturation levels.

Eurythermic fish. Can live in the temperature range of 0-300C. Euryphagy - feeds on food availability conditions: plankton, detritus, algae, insect larvae, crustaceans and other invertebrates. The main food is chironomid larvae and midges. Sexually matures at the age of 2-4 years, depending on environmental conditions. Spawns in groups, in portions. Fecundity is 30-400 thousand eggs. Incubation period - 5-7 days. Spawning begins in the spring, after water heating to 140C. Characterized by a special reproductive feature - gynogenesis (birth of females). Often, the silver carp population consists only of females, since a male of a related (carp) species can participate in its reproduction, which only stimulates the spawning process and does not fertilize the eggs, resulting in only female carp. This feature, together with high resistance to temperature fluctuations and anoxic conditions, ensures high biological plasticity of the carp, which is manifested in its distribution and abundance in all ponds.

Common rudd - Scardinius erythrophthalmus



5. Possible anthropogenic impacts during bridge construction and recommendations for their mitigation

5.1. How to preserve the biodiversity of aquatic ecosystems during bridge planning and construction

The protection and preservation of fish resources during bridge construction is one of the most difficult tasks , requiring a comprehensive approach and taking into account all factors. First of all, it is necessary to conduct a preliminary study of the biological situation in the riverbed: to determine which species are characteristic of this area, their characteristics and needs. Based on this information, it is possible to Development of a protection plan.
One environmentally effective method of maintaining fish populations during bridge construction is to use a temporary bund system . This is a system of temporary bunds that Built to ensure unhindered movement of fish Bypassing the construction site and along the riverbed. The use of a temporary diversion channel system allows the fish passage system to function properly and maintains water flow , which It is a necessary condition for the survival of fish and other aquatic organisms.

5.2. How to prevent fish death

During the construction of bridges over rivers , there is a high risk of fish mortality due to changes in the habitat . The following methods can be used to prevent this:

- Engineering measures: Temporary barriers , such as noise barriers or mesh barriers , may be erected prior to bridge construction, in both cases with the aim of protecting the work area . Isolation and movement restrictions for fish in the construction area .
- Pollutants Preventing water from entering (spills) : bridges During construction, it is necessary to avoid the discharge (spill) of pollutants into the river , which could harm aquatic biological organisms .
- environmental requirements : Designers and builders must comply with all environmental regulations and requirements to minimize impacts on natural biodiversity, including fish.
- Monitoring: After the completion of the bridge construction, regular 3-year monitoring of the water body and fish populations should be planned to assess the impact and take further measures if necessary .

will help minimize the impact of bridge construction on fish and their habitats and preserve natural biodiversity in aquatic ecosystems.

5.3. How to plan the construction time of a bridge

The main stages of planning the timing of bridge construction:

1. Estimating the scope of work. It is necessary to conduct a detailed analysis, identify all stages of construction and estimate the scope of work for each of them.
2. Prioritize. You should identify priority steps that require special attention and may take more time .

3. Organize the work schedule. A work schedule should be developed that visually shows the sequence and timing of each work stage . All factors affecting the work should be taken into account , including climatic conditions and the availability of necessary resources.
4. Resource allocation. For all stages of construction The availability of both material and human resources should be ensured . Resources should be allocated in a way that minimizes disruptions and ensures efficient use of resources .
5. Control and monitoring planning . A control and monitoring system should be developed to track the progress of the work and adjust the work schedule as necessary .

It is important to remember that bridge construction planning is a dynamic process that may require adjustments to the schedule of remaining works as the work progresses . Continuous monitoring and timely response to changes will ensure the successful and timely completion of the project.

5.4. How to determine the most suitable location for a bridge

First of all, it is important to take into account the geographical features of the territory. It is important to determine the relief , depth and average speed of the water flow . Also, possible fluctuations in the water level according to the seasons are taken into account . These issues are important both from an engineering and environmental point of view.

It is also important to consider the biological environment in which the bridge is to be built. When choosing a location, sections of the riverbed densely populated with large populations of aquatic organisms, including fish, should be avoided. Bridges can create difficult-to-cross barriers for fish migration and disrupt their natural migration routes.

It is important to remember that the construction of a bridge can cause significant environmental changes. Therefore, both infrastructural - social - and environmental considerations should be taken into account when selecting a location.

5.5. How to build temporary fences.

When constructing bridges, it is important to provide temporary barriers to protect fish from construction activities and minimize potential negative impacts.

Here Given Several The step that Will you help me? Effective Time is running out. Barriers In creation :

1. Rate this Bridge Construction Place Nearby Territory . To be taken into account Water Stream , fish And Other Water The existence of biological organisms And Their Possible Migration Routes .

2. Select a suitable temporary material For arranging fences . Recommended Ecologically Clean And Non-destructive Materials Use , such as Special Nets Or Artificial Barriers (channels).
3. Bridge Construction Territory around and install Temporary Boundaries . Separate . They so that Avoid fish. And Other Water Animals Dangerous In the zone Login .
4. Regularly Check it out. And To be repaired if necessary Temporarily Make sure that They No is Damaged Or Moved to Avoid fish . Negative Impact .
5. Of necessity In case , cooperate With environmentalists And Other With specialists Temporary Borders Optimal System to develop , which Will satisfy Specific Relief And Requirements for the protection of fish resources .

Temporary Barriers Maybe to be Effective A tool for catching fish during bridge construction To protect . To be protected . Recommendations And Environmental laws to To a minimum To be taken to the hospital Negative Impact Fish And They Habitats .

5.6. How to organize construction work without harming fish

Bridge Construction Maybe Negative Influence to have Fish And Other Water organisms . However , certain Preventive Dimensions By accepting , it is possible Damage Reduction And Local On the ecosystem Works Impact To a minimum Reduction .

First In the queue , it is necessary Nearby Water Resources Comprehensive To study in order to To be determined Fish farming And Important for fish Habitats Existence . This Information Useful There will be Construction Planning And For the bridge Optimal Location To select .

Except In addition , it is necessary Specialized Construction of equipment And Equipment Use which No Will hurt Fish And Local Wild Nature . For example , the The use of clamps should be avoided. Hammers Underwater Fire without , in order to At first To be avoided Strong Hydrodynamic Waves Creation and distribution .

Also , I must To be seen Accepted Dimensions Construction Materials And With waste Water Pollution At first To prevent . Especially Sensitive Water In ecosystems Construction Works I must To be carried out Protective Of screens using in order to At first To be seen Avoided Construction Materials In the water To get there .

It is of the utmost importance. Construction At the time Noise And Vibration Level Control . This Achievement Possible Specialized Voice Insulation Materials Using And Work Schedule By developing , in order to To a minimum To be seen Reduced Noise And Vibration Increase Periods .

In principle , construction Works Appropriate By planning And By the way , fish And Other Water On organisms Actual Harmful Impact Maybe significantly To decrease . Such Dimensions Also corresponds Sustainable Construction In general principles that Hand It helps Ecosystems And Their Biodiversity To maintain Construction Projects Time .

Environmentally friendly And Regulatory With the organs Relevant Coordination Also Hand It helps Construction At the time Water biological On resources Any Unwanted Activity or /and Impact To fix And About them Respond .

Bridges Construction At the time Fish resources And Water Ecosystems By maintaining , we No Only Hand We are organizing Biodiversity preservation , but We are influenced by the bets . That Topics And Organizations Life on the quality , which This On ecosystems Are Dependent on Ursati And In terms of recreation .

5.7. How to protect fish from vibration and noise

Bridge Construction At the time Fish Protection Maybe The problem becomes a problem because With the construction process Connected Vibration And Noise Maybe Negatively To act Fish Health . However , there are Row The dimensions of which Acceptance too Provision About fish Impact Minimization And They Security .

5.7.1 Vibration Level Reduction :

To reduce the impact of vibration on fish, special screens or shock-absorbing devices can be used. These devices absorb and distribute the vibration energy, which helps protect the fish.

5.7.2 Noise level Isolation:

Noise generated during bridge construction can also have a negative impact on fish. Special sound insulation materials can be used to protect against noise, reduce noise levels and minimize its impact on fish.

It is important to remember that measures to protect fish from vibration and noise should be implemented throughout the entire bridge construction process. This will help minimize potential negative impacts on fish and maintain the sustainability of aquatic biodiversity.

5.8 How to control fish population density

Monitoring fish populations requires preliminary surveys and an assessment of their current status. This can be done using traps such as nets or electric fish traps. After that, it is possible to determine the optimal fish population density for a given area.

There are various ways to control fish populations. One of them is to regulate the inflow of water. If the population density is too high, increasing the inflow of water can be a condition for increasing the space available to fish and improving their living conditions. If necessary, temporary fishing bans or catch size - quantitative restrictions can also be imposed.

It is also important to assess the impact of bridge construction on fish populations and take the necessary measures to minimize their negative impact.

It can be concluded that monitoring fish populations during bridge construction is an integral part of fish conservation. Proper management ensures the sustainable development of fish populations, the preservation of biodiversity, and the protection of fish for future generations.

5.9 How to use ecofilters to maintain fish populations .

Bridge construction can have a negative impact on local ecosystems, including fish and other aquatic organisms. However, the installation of ecofilters can significantly reduce the damage to fish during bridge construction.

Ecofilters are specialized devices designed to purify water from various contaminants that may arise during construction. They help maintain the natural balance in water systems, providing comfortable conditions for fish and other aquatic organisms.

Installing ecofilters is a fairly simple process. During bridge construction, filters are installed near work sites where water can become contaminated with sand, clay, cement, and other materials. These filters act as special barriers that trap unwanted harmful substances while allowing clean water to drain away. This significantly reduces the risk of fish injury or poisoning.

In addition to installing ecofilters, it is necessary to take measures to minimize stress on fish. Fish can develop stress due to changes in water conditions, so it is important to maintain comfortable living conditions for them. This can be achieved by monitoring water quality, maintaining optimal oxygen levels, and controlling noise and vibration levels.

It is important to note that the use of ecofilters must comply with local laws and environmental regulations. When selecting and installing ecofilters, it is recommended to consult with environmental experts or water resources specialists to ensure that the filters used will effectively protect both fish and the environment.

5.10 How to ensure food availability for fish

During the construction of bridges, especially those that alter the dynamics of water flow, fish are at increased risk of encountering obstacles that will impede their movement and limit their access to feeding areas. However, there are ways to minimize these problems and ensure that fish have access to sufficient food resources.

One of the main measures is the construction of fishways, which will allow fish to overcome obstacles. Fishways should allow fish to move over obstacles both vertically and horizontally.

When constructing such fishways, it is important to consider the flow of water and create conditions that allow the fish to move as naturally as possible. This is necessary so that the fish can overcome obstacles without undue effort and stress.

To ensure more effective recovery of fish populations, it is also important to provide them with resting places. This could include special resting reefs or floating structures where fish can rest and recover.

The implementation of control and monitoring systems during bridge construction to ensure access to food resources for fish is also crucial. Sensors, cameras and other devices allow us to track fish movements and assess the efficiency of fishing routes. This allows, if necessary, to take measures to improve the efficiency of fish feeding migration.

Benefits of providing access to food resources for fish

1. Helps restore fish populations and maintain ecosystems;
2. Ensures sustainable and balanced development of the fishing industry;
3. Increases biodiversity in river systems;
4. Reduces the likelihood of environmental problems and conflicts

Protecting fish populations and ensuring their access to food resources during bridge construction is a critically important task that requires the use of modern technologies and taking into account the peculiarities of fish migration. The use of fish passes and their efficiency control systems ensures safe and unhindered access of fish to food resources and contributes to the preservation of fish populations and the biodiversity of aquatic ecosystems.

5.11 How to install barriers to protect fish from construction dust

The large amounts of construction dust released during bridge construction can be hazardous to fish living under the bridge. Dust particles can enter the water and pollute it, disrupt the ecosystem, and negatively impact fish.

To protect fish from construction dust, it is essential to install fences near work areas. Here are some simple steps to help you achieve this:

1. Construction site assessment: Before installing barriers, determine the area where dust will be most intense. Consider wind conditions, direction, and potential dust sources.
2. Choose the right materials: Various materials can be used to create fences, such as mesh or special fabric. It is important to choose a material that will effectively retain dust and also ensure natural circulation of air and water.
3. Fence Installation: Place selected material around the construction area to create a dust barrier. The fence should be high and strong enough to effectively contain dust particles and prevent them from entering the water.
4. Ensure regular maintenance of installed barriers: Regular maintenance of the barrier is important, especially during periods of high intensity of construction activity. To maintain its effectiveness, its condition should be regularly checked, damaged parts repaired and worn parts replaced.

Installing barriers to protect fish from construction dust is an important task that will help maintain the ecosystem and ensure the safety of fish. By following the steps above, it is possible to minimize the negative impact of construction on aquatic biological resources and maintain the balance of the natural environment.

5.12 How to monitor fish health during construction

During bridge construction, monitoring and controlling fish health is essential to minimize negative impacts on the ecosystem. There are several methods for such monitoring.

1. Visual observation: This is the simplest and most accessible method. Specialists can observe the fish and record any changes in their behavior or appearance. Observation is important both before and during construction.
2. Use of nets and barriers: This method involves placing special nets and other equipment that prevent fish from entering the construction area. This allows specialists to monitor fish populations and their condition.
3. Using radio frequency tags: This method allows for real-time tracking of fish movements. A tag attached to the fish transmits signals that can be received by special equipment. This allows for more accurate and detailed monitoring.
4. Use of hydroacoustic equipment: This is a modern method based on sound stimulation of fish. Hydroacoustic devices record the fish's reaction to sound impulses, which allows monitoring of fish movement and condition.

A combination of methods and approaches is recommended for the most effective monitoring of fish conditions during bridge construction. This will ensure accurate, reliable, and environmentally safe monitoring of fish and preserve their migration routes.

5.13 How to comply with environmental safety requirements when building bridges

One of the important requirements is a preliminary environmental assessment of the bridge construction site. This allows for the identification of particularly sensitive areas in terms of the environment and wildlife. If such areas exist, measures should be developed to preserve them and prevent negative impacts from construction.

In addition, environmentally safe materials and technologies should be used in the construction of bridges.

Another important aspect is the management of wastewater and rainwater runoff from the construction site, preventing them from entering water bodies. For this purpose, special wastewater treatment systems and rainwater harvesting devices are used. This prevents pollution of water resources and preserves their ecological value.

It is also important to consider the impact of noise, air pollution and dust on the environment and wildlife. Modern methods of noise and dust management should be used during construction. For example, noise-absorbing screens

and dust containment systems can be used. This will help minimize harmful effects on biological systems and their vital functions.

Requirements	Measures to be taken
Conducting a preliminary environmental assessment of the bridge construction site	Identifying sensitive areas and developing conservation measures for them
Use of environmentally friendly materials and technologies	Using biodegradable composites in construction
wastewater and rainwater drainage from the construction site	Use of wastewater treatment systems and rainwater harvesting devices
Consideration of noise, air pollution and dust impacts	Use of modern methods of noise and dust management

Adhering to environmental safety requirements during bridge construction minimizes negative impacts on the environment and wildlife. This is important for maintaining biodiversity and environmental sustainability.

12 SUPPLEMENTARY DOCUMENT 6: SOME HSE NON-CONFORMANCE REPORTS

NON -CONFORMANCE REPORT
შეუსაბამობის აქტი

NCR description /აღწერა	Issue Date /გაცემის თარიღი	Reference Number/ნომერი
OHS NON-Conformance/შეუსაბამობა	01.10.2025	022

Initiator *(Name of Engineer)* /ინიციატორი (სახელი გვარი)	*Goga Sumbadze/გოგა სუმბაძე*	**Receiver** *(Name of contractor representative)* /მიმრები (სახელი გვარი)	*Irakli Nadareishvili/ირაკლი ნადარეიშვილი*
Signature/ხელმოწერა		**Signature/ხელმოწერა**	

Description of the NCR / NCR-ს აღწერა

Form: FM-HSSE001
Rev: 00

Page 1 of 3

NON -CONFORMANCE REPORT
შეუსაბამობის აქტი

(PK-0+900)-ზე სამუშაოები მიმდინარეობს უსაფრთხოების ნორმების დარღვევით. კერძოდ: სამუშაოში ჩართული დასაქმებულები, შედუღებით სამუშაოებს აწარმოებენ პერსონალური დამცავი აღჭურვილობის გარეშე. (შემდგომში- PPE)

შედუღებითი სამუშაოები მიმდინარეობს შეზღუდულ სივრცესა და წყალთან კონტაქტის პირობებში, რაც ქმნის რისკს დასაქმებულთათვის ელექტრო შოკის მიღებას, შესაბამისი აღჭურვილობისა და პირობების გარეშე.

ზემოაღნიშნული დარღვევები წარმოადგენს კრიტიკულ შეუსაბამობას, რომელიც საჭიროებს დაუყოვნებლივ რეაგირებას!

- აღჭურვეთ დასაქმებულები შესაბამისი PPE-ით.
- თუ სამუშაო ადგილის ზედაპირის სრულად ამოშრობა შეუძლებელია, დაამზადეთ ანტისტატიკური ადვილად გადასაადგილებელი, მობილური პლატფორმები, რაზეც შემდუღებლები იმუშავებენ უსაფრთხოდ.
- ჩაუტარეთ მათ ტრენინგი შედუღებითი სამუშაოების უსაფრთხოდ წარმოების შესახებ.

ზემოაღნიშნული დარღვევები წარმოადგენს საქართველოს კანონმდებლობის დარღვევას, კერძოდ:

საქართველოს ორგანული კანონი შრომის უსაფრთხოების შესახებ

საქართველოს მთავრობის განკარგულებები- №590 და № 340

დაუყოვნებლივ გამოასწორეთ არსებული შეუსაბამობები.

Work at (PC-0+900) is being carried out in violation of safety requirements. Specifically, the workers engaged in the activity are performing welding works without personal protective equipment (hereinafter – PPE).

The welding works are being conducted in a confined space and in contact with water, which creates a risk of electric shock to the workers, without appropriate equipment and conditions.

These violations constitute a critical breach requiring immediate response!

- Provide the workers with the necessary PPE.
- In case it is not possible to completely dry the work surface, prepare antistatic, easily movable, mobile platforms on which welders can safely perform their tasks.
- Conduct a safety briefing with the workers regarding the performance of welding works.

The above-mentioned violations constitute a breach of the legislation of Georgia, namely: the Organic Law of Georgia "On Occupational Safety" and the Government Decrees of Georgia No. 590 and No. 340.

The identified nonconformities must be eliminated without delay.

NON -CONFORMANCE REPORT
შეუსაბამობის აქტი

Root Cause, Correction and Corrective Action *(to be filled by receiver)* *Include details of why the nonconformity occurred. What will be done to immediately correct it and what corrective actions will be in place so that it does not recur.* **ძირეული მიზეზი, კორექცია და მაკორექტირებელი მოქმედება (მიმღების მიერ შევსებული)** *ჩართეთ დეტალები, თუ რატომ მოხდა დარღვევა,და რა ქეთდება გამოსწორების მიზნით , ასევე რა მაკორექტირებელი ქმედება იქნება გამოყენებული*

Closeout *(to be filled by closeout authority or by resident engineer)* **/დახურვა** *(შეავსოს უფლებამოსილი ან რეზიდენტ ინჟინრის მიერ)/*	
Validator Name & Signature *ინსპექტორის სახელი & გვარი*	**Validation Date** */ინსპექტირების თარიღი*

NON -CONFORMANCE REPORT
შეუსაბამობის აქტი

NCR description /აღწერა	Issue Date /გაცემის თარიღი	Reference Number/ნომერი
OHS NON-Conformance/შეუსაბამობა	04.12.2025	026

Initiator *(Name of Engineer)* /ინიციატორი (სახელი გვარი)	*Goga Sumbadze/გოგა სუმბაძე*	**Receiver** *(Name of contractor representative)* /მიმღები (სახელი გვარი)	*Irakli Nadareishvili/ირაკლი ნადარეიშვილი*
Signature/ხელმოწერა		**Signature/ხელმოწერა**	

Description of the NCR / NCR-ს აღწერა






NON -CONFORMANCE REPORT
შეუსაბამობის აქტი

PK-800-ზე სამუშაოები მიმდინარეობს უსაფრთხოების წესების დარღვევით. სიმაღლეზე სამუშაოებისათვის გამოიყენება არასწორად დამონტაჟებული ხარაჩო, რომელიც ვერ პასუხობს საერთაშორისო და საქართველოს კანონმდებლობით გათვალისწინებულ მოთხოვნებს. ის წარმოადგენს კრიტიკულ შეუსაბამობას, რომელიც საფრთხეს უქმნის დასაქმებულების სიცოცხლეს და ჯანმრთელობას.

ასევე დასაქმებულები გადაადგილდებიან და ასრულებენ სამუშაოებს პერსონალური დამცავი აღჭურვილობის გარეშე (**PPE**). ისინი არ იყენებენ უსაფრთხოების **ჩაფხუტს**, **ჟილეტს** და **ფეხსაცმელს**.

- დაამონტაჟეთ ხარაჩო ისე რომ შეესაბამებოდეს საქართველოს მთავრობის №447 დადგენილების მოთხოვნებს.

კერძოდ: იხ. საქართველოს მთავრობის დადგენილება №447 **მუხლი 5** (მოთხოვნები დამცავი მოაჯირების მოწყობისა და ექსპლუატაციის მიმართ) და **მუხლი 6** (ზოგადი მოთხოვნები ხარაჩოების მოწყობისა და ექსპლუატაციის მიმართ)

- გადაეცით და აღჭურვეთ დასაქმებულები (**PPE**)-თი.

ზემოაღნიშნული შეუსაბამობები წარმოადგენს საქართველოს მთავრობის №477 და № 590 დადგენილების დარღვევას.

მყისიერად გამოასწორეთ არსებულლი შეუსაბამობები

Work activities at section PK-800 are being carried out in violation of occupational safety requirements.
Improperly installed scaffolding is being used for work at height, which does not comply with international standards or the applicable legislation of Georgia. This constitutes a serious violation and poses an immediate threat to the life and health of the workers.

In addition, employees are moving and performing tasks without the use of personal protective equipment (PPE): safety helmets, high-visibility vests, and protective footwear are not being used.

The following corrective measures are required:
- Bring the scaffolding installation into full compliance with the requirements of the Government of Georgia Decree No. 447, including Article 5 (requirements for the installation and operation of protective barriers) and Article 6 (general requirements for the installation and operation of scaffolding).

NON-CONFORMANCE REPORT
შეუსაბამობის აქტი

• Provide workers with all necessary personal protective equipment and ensure strict control over its mandatory use. The identified non-conformities constitute violations of Government of Georgia Decrees No. 447, No. 477, and No. 590. Immediate corrective actions must be taken to eliminate these violations.

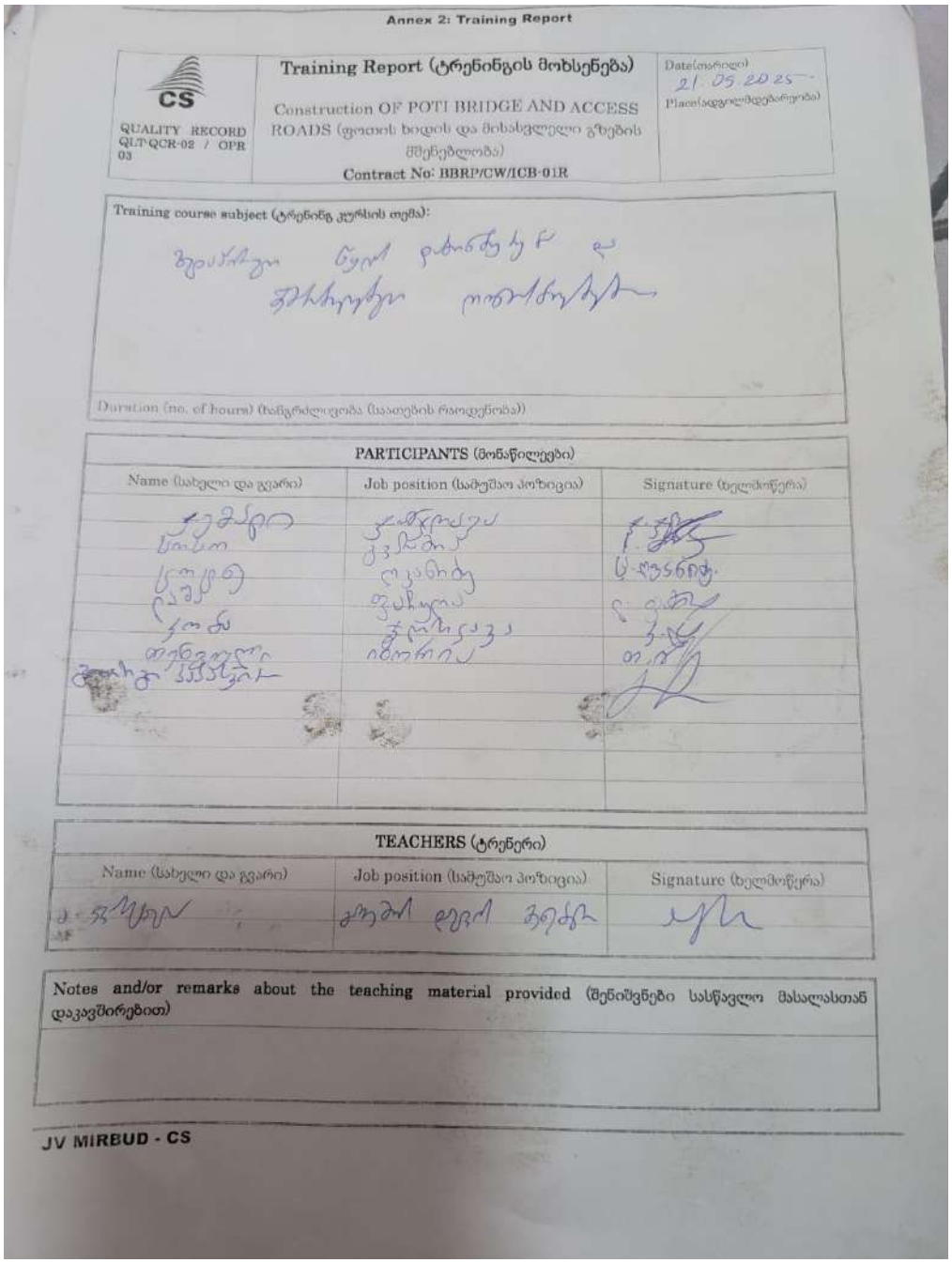
Root Cause, Correction and Corrective Action *(to be filled by receiver)* *Include details of why the nonconformity occurred. What will be done to immediately correct it and what corrective actions will be in place so that it does not recur.* **ძირეული მიზეზი, კორექცია და მაკორექტირებელი მოქმედება (მიმღების მიერ შევსებული)** *ჩართეთ დეტალები, თუ რატომ მოხდა დარღვევა, და რა ქეთდება გამოსწორების მიზნით , ასევე რა მაკორექტირებელი ქმედება იქნება გამოყენებული*

Closeout *(to be filled by closeout authority or by resident engineer)* **/დახურვა** *(შეავსოს უფლებამოსილი ან რეზიდენტ ინჟინრის მიერ)/*	
Validator Name & Signature *ინსპექტორის სახელი & გვარი*	**Validation Date** */ინსპექტირების თარიღი*

13 SUPPLEMENTARY DOCUMENT 7: H&S AND E&S TRAINING ATTENDANCE SHEET SAMPLE AND SOME TRAINING PHOTOS

Some Photos from H&S and Environmental Trainings

Some Sample Training Attandance Sheets



Annex 2: Training Report

CS QUALITY RECORD QLT-QCR-02 / OPR 03	Training Report (ტრენინგის მოხსენება) Construction OF POTI BRIDGE AND ACCESS ROADS (ფოთის ხიდის და მისასვლელი გზების მშენებლობა) Contract No: BBRP/CW/ICB-01R	Date(თარიღი) 21.05.2025 Place(ადგილმდებარეობა)

Training course subject (ტრენინგ კურსის თემა):

Duration (no. of hours) (ხანგრძლივობა (საათების რაოდენობა))

PARTICIPANTS (მონაწილეები)

Name (სახელი და გვარი)	Job position (სამუშაო პოზიცია)	Signature (ხელმოწერა)

TEACHERS (ტრენერი)

Name (სახელი და გვარი)	Job position (სამუშაო პოზიცია)	Signature (ხელმოწერა)

Notes and/or remarks about the teaching material provided (შენიშვნები სასწავლო მასალასთან დაკავშირებით)

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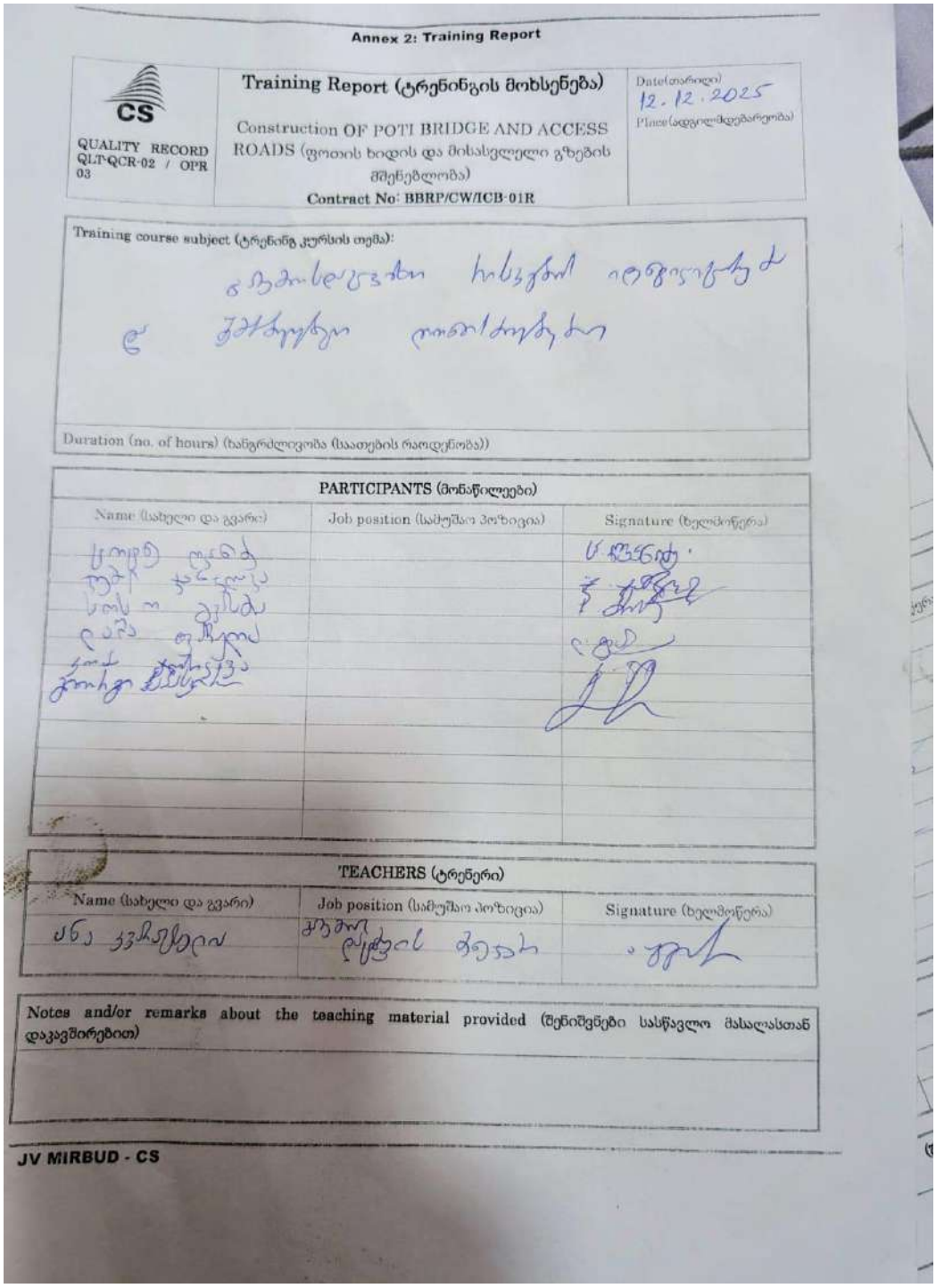

Annex 2: Training Report

CS

QUALITY RECORD QLT-QCR-02 / OPR 03

Training Report (ტრენინგის მოხსენება)

Construction OF POTI BRIDGE AND ACCESS ROADS (ფოთის ხიდის და მისასვლელი გზების მშენებლობა)

Contract No: BBRP/CW/ICB-01R

Date(თარიღი) 12.12.2025

Place(ადგილმდებარეობა)

Training course subject (ტრენინგ კურსის თემა):

Duration (no. of hours) (ხანგრძლივობა (საათების რაოდენობა))

PARTICIPANTS (მონაწილეები)

Name (სახელი და გვარი)	Job position (სამუშაო პოზიცია)	Signature (ხელმოწერა)

TEACHERS (ტრენერი)

Name (სახელი და გვარი)	Job position (სამუშაო პოზიცია)	Signature (ხელმოწერა)

Notes and/or remarks about the teaching material provided (შენიშვნები სასწავლო მასალასთან დაკავშირებით)

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14 SUPPLEMENTARY DOCUMENT 8: ENVRIONMENTAL NCRS

NON-CONFORMANCE REPORT
შეუსაბამობის აქტი

NCR description /აღწერა	Issue Date /გაცემის თარიღი	Reference Number/ნომერი
Env. NON-Conformance/შეუსაბამობა	**28.10.2025**	**002**

Initiator *(Name of Engineer) /ინიციატორი (სახელი გვარი)*	*Emre Duran/ემრე დურანი*	**Receiver** *(Name of contractor representative) /მიმრები (სახელი გვარი)*	*Irakli Nadareishvili/ირაკლი ნადარეიშვილი*
Signature/ხელმოწერა		**Signature/ხელმოწერა**	

Description of the NCR *(to be filled by initiator)*
Concrete slurry and debris were observed being discharged from the peninsula area into the Rioni river. Accumulated residues were visible along the artificial island's riverbank, posing a direct environmental threat and indicating improper disposal of construction materials. This action contravenes the Site Environmental Management Plan and established waste handling procedures, leading to water contamination risks.

/ **NCR-ს აღწერა** *(უნდა შეავსოს ინიციატორმა)*

პენისულას ტერიტორიიდან რიონის მდინარეში დაფიქსირდა ბეტონის ნალექისა და ნამსხვრევების ჩაშვება. ხელოვნური კუნძულის სანაპირო ზოლზე აშკარად შეინიშნებოდა დაგროვილი ნარჩენები, რაც წარმოადგენს პირდაპირ გარემოსდაცვით საფრთხეს და მიუთითებს სამშენებლო მასალების არასწორ განთავსებაზე. აღნიშნული ქმედება არღვევს ობიექტის გარემოსდაცვითი მართვის გეგმას და დადგენილ ნარჩენების მართვის პროცედურებს, რაც იწვევს წყლის დაბინძურების რისკს

NON-CONFORMANCE REPORT
შეუსაბამობის აქტი

The non-conformance was identified during a field visit, where visual inspection confirmed that **concrete residue** had been released into the Rioni river from active construction operations. This incident demonstrates a clear failure to implement and monitor adequate waste containment measures. Such discharges contribute to elevated pH levels and sediment contamination, adversely affecting aquatic habitats and undermining project compliance with environmental standards and regulatory requirements.

Immediate cleanup of the affected area—including the river—is mandatory. All concrete residue must be completely removed, ensuring no further contamination remains. The cleanup must be completed **within three (3) calendar days** from the issuance of this NCR. **Photographic evidence** confirming the satisfactory completion of cleanup works shall be submitted for verification and NCR closure.

To avoid recurrence, targeted environmental awareness and proper waste disposal **training** must be provided for all concrete **truck drivers and site personnel** involved in material handling. **The training attendance sheet** is required for NCR closure. Additionally, containment barriers and runoff controls must be installed at all active concrete pouring areas to prevent future discharges. A **designated impermeable washout area** will be established and strictly used for all concrete waste management activities.

შეუსაბამობა დაფიქსირდა ადგილზე ვიზიტის დროს, სადაც ვიზუალური შემოწმებით დადასტურდა, რომ მიმდინარე სამშენებლო სამუშაოებიდან ბეტონის ნარჩენები ჩაედინებოდა მდინარე რიონში. აღნიშნული შემთხვევა ცხადყოფს, რომ ვერ ხორციელდება სათანადო ნარჩენების შეკავებისა და მონიტორინგის ზომები. მსგავსი ჩანადინარები იწვევს pH-ის დონის მატებასა და ნალექით დაბინძურებას, რაც უარყოფითად მოქმედებს წყლის ეკოსისტემებზე და არღვევს პროექტის გარემოს დაცვის სტანდარტებსა და რეგულაციურ მოთხოვნებს.

აუცილებელია დაუყოვნებლივ ჩატარდეს დაზიანებული ტერიტორიის — მათ შორის მდინარის — გაწმენდა. ყველა ბეტონის ნარჩენი სრულად უნდა მოიხსნას ისე, რომ შემდგომი დაბინძურება გამოირიცხოს. გაწმენდითი სამუშაოები უნდა დასრულდეს აღნიშნული NCR-ის გაცემიდან სამი (3) კალენდარული დღის ვადაში. გაწმენდითი სამუშაოების დამაკმაყოფილებელი შესრულების დასადასტურებლად საჭიროა ფოტომტკიცებულებების წარმოდგენა გადამოწმებისა და NCR-ის დახურვის მიზნით.

მომხდარის განმეორების თავიდან ასაცილებლად აუცილებელია მიზნობრივი გარემოსდაცვითი ცნობიერების ამაღლება და ნარჩენების სათანადო მართვის შესახებ ტრენინგის ჩატარება ყველა ბეტონის სატრანსპორტო საშუალების მძღოლისა და მასალების მართვაში ჩართული პერსონალისთვის. ტრენინგის დასწრების სია აუცილებელია NCR-ის დახურვისთვის. გარდა ამისა, ყველა აქტიურ ბეტონის ჩასხმის ზონაში უნდა დამონტაჟდეს შეკავების ბარიერები და ჩამონადენის საკონტროლო სისტემები, რათა მომავალში ჩადინება თავიდან იქნეს აცილებული. ასევე, უნდა მოეწყოს სპეციალური წყალგაუმტარი ზონა, რომელიც სპეციალურად იქნება გამოყენებული ბეტონის ნარჩენების მართვის საქმიანობებისთვის.

NON -CONFORMANCE REPORT
შეუსაბამობის აქტი

Root Cause, Correction and Corrective Action *(to be filled by receiver)* **ძირეული მიზეზი, კორექცია და მაკორექტირებელი მოქმედება (მიმღების მიერ შევსებული)**
Closeout *(to be filled by closeout authority or by resident engineer)* **/დახურვა** *(შეავსოს უფლებამოსილი ან რეზიდენტ ინჟინრის მიერ)/*

Validator Name & Signature *ინსპექტორის სახელი & გვარი*	**Validation Date** */ინსპექტირების თარიღი*

UBM

NON-CONFORMANCE REPORT
შეუსაბამობის აქტი

CS mirbud®

NCR description /აღწერა	Issue Date /გაცემის თარიღი	Reference Number/ნომერი
Env. NON-Conformance/შეუსაბამობა	28.10.2025	002

Initiator *(Name of Engineer)* /ინიციატორი (სახელი გვარი)	*Emre Duran/ემრე დურანი*	**Receiver** *(Name of contractor representative)* /მიმღები (სახელი გვარი)	*Irakli Nadareishvili/ირაკლი ნადარეიშვილი*
Signature/ხელმოწერა		**Signature/ხელმოწერა**	

Description of the NCR *(to be filled by Initiator)*
Concrete slurry and debris were observed being discharged from the peninsula area into the Rioni river. Accumulate residues were visible along the artificial island's riverbank, posing a direct environmental threat and indicatir improper disposal of construction materials. This action contravenes the Site Environmental Management Plan an established waste handling procedures, leading to water contamination risks.

/ **NCR-ს აღწერა** *(უნდა შეავსოს ინიციატორმა)*

პენისულას ტერიტორიიდან რიონის მდინარეში დაფიქსირდა ბეტონის ნალექისა და ნამსხვრევები ჩაშვება. ხელოვნური კუნძულის სანაპირო ზოლზე აშკარად შეინიშნებოდა დაგროვილი ნარჩენები, რა წარმოადგენს პირდაპირ გარემოსდაცვით საფრთხეს და მიუთითებს სამშენებლო მასალების არასწო განთავსებაზე. აღნიშნული ქმედება არღვევს ობიექტის გარემოსდაცვითი მართვის გეგმას და დადგენი ნარჩენების მართვის პროცედურებს, რაც იწვევს წყლის დაბინძურების რისკს

NON-CONFORMANCE REPORT
შეუსაბამობის აქტი

NCR description /აღწერა	Issue Date /გაცემის თარიღი	Reference Number/ნომერი
Env. NON-Conformance/შეუსაბამობა	**28.10.2025**	**003**

Initiator *(Name of Engineer) /ინიციატორი (სახელი გვარი)*	*Emre Duran/ემრე დურანი*	**Receiver** *(Name of contractor representative) /მიმრები (სახელი გვარი)*	*Irakli Nadareishvili/ირაკლი ნადარეიშვილი*
Signature/ხელმოწერა		**Signature/ხელმოწერა**	

Description of the NCR
Unaddressed oil and fuel spills persist in key operational areas—specifically the Material Storage, Workshop, Vehicle Maintenance, and Fuel Filling areas. This condition violates the "Environmental Management Plan" and "Hazardous Waste" procedures, creating an immediate risk of soil and surface water contamination and regulatory non-compliance. The issue continues despite repeated warnings and prior communications.

NCR-ს აღწერა

მთავარ საოპერაციო ზონებში — კერძოდ, მასალების საწყობში, სახელოსნოში, ტრანსპორტის მოვლა-შენახვის და საწვავის შევსების ადგილებში — ნავთობისა და საწვავის დაღვრილი ნარჩენები კვლავ დაუმუშავებლად რჩება. ეს ფაქტი არღვევს „გარემოსდაცვითი მართვის გეგმისა“ და „სახიფათო ნარჩენების“ პროცედურებს, რაც ქმნის ნიადაგისა და ზედაპირული წყლების დაბინძურების რისკს და არღვევს დადგენილ ნორმებს. მიუხედავად არაერთი გაფრთხილებისა და წინა კომუნიკაციებისა, აღნიშნული პრობლემა კვლავ გრძელდება.

NON-CONFORMANCE REPORT
შეუსაბამობის აქტი

Material storage and workshop area

Vehicle maintanance and fuel filling area

NON-CONFORMANCE REPORT
შეუსაბამობის აქტი

This Non-Conformance Report (NCR) documents persistent **oil/fuel spills** observed across the **Material Storage, Vehicle Maintenance, and Fuel Filling Areas**. This condition violates the Site Environmental Management Plan and Hazardous Waste Management Procedures, posing an immediate risk of **soil and surface contamination** and non-compliance with environmental regulations. Critically, this non-conformance was noted despite continuous warnings and prior communications regarding the unaddressed spills.

To resolve this issue, all identified areas contaminated with oil/fluid spills must be **immediately and thoroughly cleaned** using appropriate spill containment and absorbent materials. The resulting contaminated waste (e.g., spent absorbents, contaminated soil) **must be classified as Hazardous Waste** and sent to the designated, approved waste collector. This cleanup is strictly due within **seven (7) business days** of this NCR's issuance. Preventatively, daily inspection checklists for material storage and vehicle repair areas must be reviewed and enhanced, and all site equipment and containers must be inspected for leaks and repaired without delay to prevent recurrence.

Official closure of this NCR requires the Contractor to submit comprehensive documentation for verification of successful resolution. This includes **Photographic Evidence** clearly demonstrating the complete cleanup and remediation of all affected oil-spill areas. Additionally, the **Waste Disposal Proof**—specifically the "Hazardous Waste Manifest" or official receipt—must be provided, confirming that the contaminated waste has been appropriately and legally transferred to a licensed collector, thereby confirming full compliance with both the corrective actions and regulatory requirements.

ეს შეუსაბამობის ანგარიში (NCR) ასახავს მასალების საწყობში, სატრანსპორტო საშუალებების მოვლა-პატრონობისა და საწვავის შევსების ზონებში დაფიქსირებულ მრავალჯერადი ზეთების და საწვავის დაღვრის შემთხვევებს. აღნიშნული სიტუაცია არღვევს ობიექტის გარემოსდაცვითი მართვის გეგმას და საშიში ნარჩენების მართვის პროცედურებს, რაც წარმოადგენს დაუყოვნებელ რისკს ნიადაგისა და ზედაპირული წყლების დაბინძურებისათვის და ასევე გარემოსდაცვითი რეგულაციების შეუსრულებლობას. განსაკუთრებით აღსანიშნავია, რომ აღნიშნული შეუსაბამობა დაფიქსირდა მიუხედავად მრავალგზის გაფრთხილებისა და წინამდებარე კომუნიკაციების და ადრე არსებული გამოუსწორებელი დაღვრილი მასალების არსებობის მიუხედავად.

პრობლემის მოსაგვარებლად, ყველა ზონა, სადაც დაფიქსირდა ზეთის ან სითხის დაღვრა, დაუყოვნებლივ და საფუძვლიანად უნდა გაიწმინდოს შესაბამისი შთანმთქმელი და შემაკავებელი მასალების გამოყენებით. გაწმენდილი მასალის ნარჩენები (მაგალითად, გამოყენებული შთანმთქმელები, დაბინძურებული ნიადაგი) უნდა კლასიფიცირდეს, როგორც საშიში ნარჩენი და გადაიცეს დამტკიცებულ და ლიცენზირებულ ნარჩენების შემგროვებელ კომპანიაზე. აღნიშნული გაწმენდა უნდა განხორციელდეს ამ შეუსაბამობის (NCR) გაცემიდან **არაუგვიანეს შვიდ (7) სამუშაო დღისა.** პრევენციულად, უნდა გადაიხედოს და გაუმჯობესდეს მასალების საწყობისა და სატრანსპორტო საშუალებების მოვლა-შენახვის ზონების ყოველდღიური შემოწმების სიები(checklists). ყველა ობიექტზე არსებული მოწყობილობა და კონტეინერი უნდა შემოწმდეს გაჟონვისთვის და დაუყოვნებლივ შეკეთდეს, რათა თავიდან იქნას აცილებული განმეორება.

აღნიშნული შეუსაბამობის (NCR) ოფიციალური დახურვა შესაძლებელია მხოლოდ იმ შემთხვევაში, თუ კონტრაქტორი წარადგენს სრულ დოკუმენტაციას, რომელიც დაადასტურებს პრობლემის წარმატებით მოგვარებას. აღნიშნული დოკუმენტაცია უნდა მოიცავდეს

NON -CONFORMANCE REPORT
შეუსაბამობის აქტი

ფოტომტკიცებულებებს, სადაც ნათლად იქნება ასახული ყველა წერტილის სრული გაწმენდა და შესწორება. გარდა ამისა, აუცილებელია წარმოდგენილი იყოს ნარჩენების განადგურების დამადასტურებელი დოკუმენტი — კერძოდ, „საშიში ნარჩენების მანიფესტი/მიღება ჩაბარების აქტი“ ან ოფიციალური ქვითარი — რომელიც დაადასტურებს, რომ დაბინძურებული ნარჩენი კანონიერად გადაეცა ლიცენზირებულ შემგროვებელს, რითაც დადასტურდება როგორც გამოსწორებითი ქმედებების, ისე რეგულაციური მოთხოვნების სრული შესრულება.

Root Cause, Correction and Corrective Action *(to be filled by receiver)*

ძირეული მიზეზი, კორექცია და მაკორექტირებელი მოქმედება (მიმღების მიერ შევსებული)

Closeout *(to be filled by closeout authority or by resident engineer)*
/**დახურვა** *(შეავსოს უფლებამოსილი ან რეზიდენტ ინჟინრის მიერ)/*

Validator Name & Signature *ინსპექტორის სახელი & გვარი*	**Validation Date** */ინსპექტირების თარიღი*

UBM

NON-CONFORMANCE REPORT
შეუსაბამობის აქტი

CS mirbud

NCR description /აღწერა	Issue Date /გაცემის თარიღი	Reference Number/ნომერი
Env. NON-Conformance/შეუსაბამობა	28.10.2025	003

Initiator *(Name of Engineer) /ინიციატორი (სახელი გვარი)*	*Emre Duran/ემრე დურანი*	**Receiver** *(Name of contractor representative) /მიმღები (სახელი გვარი)*	*Irakli Nadareishvili/ირაკლი ნადარეიშვილი*
Signature/ხელმოწერა		**Signature/ხელმოწერა**	

Description of the NCR
Unaddressed oil and fuel spills persist in key operational areas—specifically the Material Storage, Workshop, Vehicle Maintenance, and Fuel Filling areas. This condition violates the "Environmental Management Plan" and "Hazardous Waste" procedures, creating an immediate risk of soil and surface water contamination and regulatory non-compliance. The issue continues despite repeated warnings and prior communications.

NCR-ს აღწერა

მთავარ საოპერაციო ზონებში — კერძოდ, მასალების საწყობში, სახელოსნოში, ტრანსპორტის მოვლა-შენახვის და საწვავის შევსების ადგილებში — ნავთობისა და საწვავის დაღვრილი ნარჩენები კვლავ დაუმუშავებლად რჩება. ეს ფაქტი არღვევს „გარემოსდაცვითი მართვის გეგმისა" და „სახიფათო ნარჩენების" პროცედურებს, რაც ქმნის ნიადაგისა და ზედაპირული წყლების დაბინძურების რისკს და არღვევს დადგენილ ნორმებს. მიუხედავად არაერთი გაფრთხილებისა და წინა კომუნიკაციებისა, აღნიშნული პრობლემა კვლავ გრძელდება.

15 SUPPLEMENTARY DOCUMENT 9: HAZARDOUS WASTE

DISPOSAL RECEIPT AND PHOTOS

1	სასაქონლო ზედნადები #	ელ- 0936600172

2	30/10/2025		3	13:09:52
	თარიღი (რიცხვი, თვე, წელი)			დრო (საათი, წუთი)

(დღგ-ს გადამხდელი) (დღგ-ს გადამხდელი)

4	შპს Construction Service	404935647	5	საქართველოს მწარმოებლის გაფართოებული ვალდებულების ასოციაცია	406350112
	გამყიდველის (გამგზავნის) დასახელება,ან სახელი და გვარი	საიდენტიფიკაციო/პირადი ნომერი		მყიდველის (მიმღების) დასახელება,ან სახელი და გვარი	საიდენტიფიკაციო / პირადი ნომერი

6	ოპერაციის შინაარსი	ტრანსპორტირების გარეშე

7	პატარა ფოთი

ტრანსპორტირების დაწყების ადგილი (მისამართი)

8	X

ტრანსპორტირების დასრულების ადგილი (მისამართი)

9		10	X		
	ტრანსპორტირების საბ		სატრანსპორტო საშუალების სახელმწიფო ნომერი		მისამძღოლი

11	სატრანსპორტო საშუალების მძღოლის პირადი ნომერი	X	12	გამყიდველის(გამგზავნის)/მყიდველის(მიმღების) მიერ გაწეული ტრანსპორტირების ხარჯი

თანხა ლარებში

სასაქონლო ზედნადების ცხრილი

#	საქონლის დასახელება	საქონლის კოდი	საქონლის ზომის ერთეული	საქონლის რაოდენობა	საქონლის ერთეულის ფასი*	საქონლის ფასი *
1	ნამუშევარი ზეთი (ნარჩენი)	ზეთი	ლიტრი	1000.0000	0.4000	400.0000

*** საბეჭდი ფორმის ბოლო გვერდი ***

13	400.0000 - ოთხასი ლარი და ნული თეთრი

მიწოდებული საქონლის მთლიანი თანხა (ციფრებით და სიტყვიერად)

14		15	
	გამყიდველი (გამგზავნი)/საქონლის ჩაბარებაზე უფლებამოსილი პირი (თანამდებობა, სახელი და გვარი)		მყიდველი (მიმღები)/საქონლის მიღებაზე უფლებამოსილი პირი (თანამდებობა, სახელი და გვარი)
16		17	
	ხელმოწერა		ხელმოწერა

18	მიწოდებული საქონლის ჩაბარების	30/10/2025	13:09:52
		თარიღი (რიცხვი, თვე, წელი)	დრო (საათი, წუთი)

19	GE37TB797283605010000 1 / შპს Construction Service

შენიშვნა: * დღგ-ს გადამხდელისათვის დღგ-ს ჩათვლით, აქციზის გადამხდელისათვის აქციზურ საქონელზე, დღგ-ს და აქციზის ჩათვლით

ამობეჭდვის თარიღი 30/10/2025, 13:10:25

გვ. 1