Public disclosure

MONGOLIA TRANSPORT CONNECTIVITY AND LOGISTICS IMPROVEMENT PROJECT
(MTCLIP, P174806)

PROJECT ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (P-ESMP)

for

LOT 1-2: A0302 ARVAIKHEER-BAYANKHONGOR 35.82 KM ROAD REHABILITATION WORKS

Client:
Ministry of Road and Transport of Mongolia

Implementing Entity / Submitted by:
Integrated Project Implementation Unit (IPIU)

Financing Institution:
World Bank

Supervision Consultant:
Soosung Engineering Co., Ltd and Dasan Co., Ltd Joint Venture, in association with Geo Zuraglal LLC

Civil Works Contractor:
China First Highway Engineering Co.,Ltd

Environmental and Social Consultant:
Ecologiin buteemj LLC

Project Period:
2025–2027 (Construction Phase)
2027–2030 (Defects Notification Period – DNP)

Environmental and Social Risk Classification:
Substantial

Ulaanbaatar, Mongolia
2026

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LIST OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION
C-ESMP	Contractor's Environmental and Social Management Plan
CoC	Code of Conduct
CSC	Construction Supervision Consultant
DAAB	Dispute Avoidance/Adjudication Board
DEIA	Detailed Environmental Impact Assessment
DNP	Defects Notification Period
E&S	Environmental and Social
EBS	Environmental Baseline Study
EHS	Environmental, Health and Safety
EHS Guidelines	Environmental, Health, and Safety Guidelines
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPP	Environmental Protection Plan
ERP	Emergency Response Plan
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESHS	Environmental, Social, Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
FIDIC	International Federation of Consulting Engineers
GBV	Gender-Based Violence
GRM	Grievance Redress Mechanism
IPIU	Integrated Project Implementation Unit
JSEA	Job Safety/Environmental Analysis
LMP	Labor Management Procedures
MECC	Ministry of Environment and Climate Change
MNS	Mongolian National Standard
MRT	Ministry of Road and Transport
MSDS	Material Safety Data Sheet
OHS	Occupational Health and Safety
PA	Protected Area
PAP	Project Affected Person/People
PM	Particulate Matter (PM10, PM2.5)
PPE	Personal Protective Equipment
RAP	Resettlement Action Plan
RCA	Root Cause Analysis
RPF	Resettlement Policy Framework
RRFNS	Road and Road Facilities Norms and Standards (Construction Code)
SDS	Safety Data Sheet
SEA/SH	Sexual Exploitation and Abuse / Sexual Harassment
SEP	Stakeholder Engagement Plan
TMP	Traffic Management Plan
WB	World Bank

INTRODUCTION

This Environmental and Social Management Plan (ESMP) is a management instrument prepared to identify, assess, mitigate, manage, and monitor the environmental and social risks and adverse impacts associated with the subproject entitled “Lot 1-2: A0302 Arvaikheer - Bayankhongor 35.82 km road rehabilitation works”, to be implemented under the Mongolia Transport Connectivity and Logistics Improvement Project (P174806).

The subproject construction contract was signed with China First Highway Engineering Co., Ltd. in May 2025 for the construction of a 35.82 km road section crossing the territories of Taragt and Khairkhandulaan soums in Uvurkhangai province. The Ministry of Road and Transport of Mongolia (MRT) will be responsible for the oversight and coordination of project implementation. The project is financed through the proceeds of a World Bank loan.

The objective of this ESMP is to define measures to avoid, prevent, minimize, mitigate, or otherwise reduce to acceptable levels the potential adverse environmental and social impacts and risks that may arise during the construction and operation phases of the project, and to establish the institutional arrangements, roles and responsibilities, monitoring, and reporting systems for implementation of such measures. This plan will serve as the principal guidance document for ensuring environmental and social performance throughout project implementation.

The ESMP has been prepared in compliance with the applicable laws and regulations of Mongolia, including legislation those related to environmental protection, environmental impact assessment, occupational health and safety, labor and working conditions, hygiene, land use, cultural heritage protection, waste management, and road traffic safety, and public health, as well as the requirements of the World Bank’s Environmental and Social Framework (ESF) and the relevant Environmental and Social Standards (ESSs).

The ESMP Plan takes into account the potential project-related environmental and social risks and impacts on associated with land use and access restrictions, air emissions and dust generation, quality, surface water and groundwater resourcescontamination, soil quality erosion and degradation, noise and vibration, biodiversity disturbance, construction camp management, hazardous and non-hazardous construction and domestic waste management, occupational health and safety (OHS), labor influx, workers` code of conduct, gender-based violence (GBV) and sexual exploitation and abuse/sexual harassment (SEA/SH) risks, community health and safety, trafiic and road traffic riskssafety, chance finds of cultural heritage, and and the impacts on local livelihoods and social environment of local communitiesvulnerable groups. For each of these identified risks and impacts, thise ESMP sets out appropriate mitigation measures, monitoring indicators, institutional responsibilities, and implementation responsibilities.timelines.

In addition, this ESMP defines mechanisms to ensure meaningful stakeholder engagement, timely diclosure promote transparency of information, and facilitate effective communication with potentially project - affected persons (PAPs), local communities, government institutions, civil society organizations, business entities, and other interested parties in accordance with the project Stakeholder Engagement Plan (SEP). It The ESMP also incorporates a project level Grievance Redress Mechanism (GRM) to receive, register, assess, as an integral part of project

implementation to receive and resolve complaints, concerns, and suggestions in timely and transparent manner.

Overall, this ESMP serves as a key instrument for the systematic management of environmental and social risks and impacts throughout all stages of project implementation. The ESMP is intended to ensure compliance with national legislation and the requirements of the World Bank, while enhancing the sustainability and positive development outcomes of the project by reducing adverse impacts and promoting beneficial results

CHAPTER 1. SUBPROJECT OVERVIEW

1.1. Basic project information

Under the Mongolia Transport Connectivity and Logistics Improvement Project (MTCLIP, P174806), financed by the World Bank and implemented by the Government of Mongolia through the Ministry of Road and Transport (MRT), Rehabilitation works will be carried out on a 35.82 km section of the A0302 national road along the Arvaikheer–Bayankhongor corridor. The subproject aims to improve road operating conditions, enhance transport efficiency, and strengthen road safety, thereby supporting regional connectivity, economic activity, and access to services for local communities.

The MRT is the Client for the Project, and the road rehabilitation civil works will be implemented by China First Highway Engineering Co., Ltd. (CFHEC) in accordance with the contract conditions and applicable environmental and social requirements. During implementation, the composition and number of workers will vary depending on the construction stage, seasonal conditions, and production workload, with a peak workforce of up to 197 workers anticipated, including skilled, semi-skilled, and unskilled labor.

To establish the environmental and social baseline conditions and to assess potential risks and impacts associated with the project activities, phased baseline studies including field surveys, observations, measurements, sampling, questionnaires, and interviews were carried out within the project's area of influence, including Taragt and Khairkhandulaan soums of Uvurkhangai province, and Arvaikheer soum. These surveys were conducted during the following periods:

- from 29 August to 3 September 2025;
- from 28 to 30 November 2025; and
- from 19 to 20 March 2026.

Based on the field investigations, the status of environmental and social baseline conditions, sensitive receptors, community characteristics, existing environmental pressures, and the main pathways of potential impacts along the Project corridor were identified. This information has been used as baseline input for the ESMP. A summary of the project is presented in Table 1.

Table 1. Project Summary Information

Item	Information
Project Name	Mongolia Transport Connectivity and Logistics Improvement Project (MTCLIP)
Subproject Name	Lot 1-2: A0302 Arvaikheer-Bayankhongor 35.82 km road rehabilitation works
Client	Ministry of Road and Transport (MRT)
Duration	07/2025–07/2027 (24 months)
Scope	35.82 km road section from Km 14+800 to Km 50+620 of National Road No. A0302, Arvaikheer-Bayankhongor
Objective	– Rehabilitate a 35.82 km section of the A0302 national road along the Arvaikheer–Bayankhongor corridor – Improve transport accessibility and connectivity in the western region – Enhance road safety – Support local and regional economic and social development – Improve the reliability and sustainability of road infrastructure

1.1.1. Importance of the Subproject

This subproject is of considerable importance because it will make a substantial contribution to the efficiency of the national and regional transport network by restoring and improving the quality, reliability, and safety of road operations.

- By repairing damage and deterioration to the pavement, base layers, shoulders, and drainage structures, the technical performance of the road will be improved and traffic safety enhanced. As a result, the risk of road traffic accidents, vehicle damage, and uncertainty in travel time will be reduced.
- Since livestock and agriculture-related activities predominate within the Project area of influence, a reliable and safe road network will reduce transport time and costs for goods, products, and raw materials, improve logistics efficiency, and support local economic circulation.
- Improved road conditions will enhance local communities' access to health, education, trade, public services, and other social services, thereby positively affecting daily mobility, travel safety, time efficiency, and overall quality of life.
- The Project will also help reduce adverse environmental consequences associated with the deteriorated road condition, including dust generation, soil degradation, and disruption of drainage patterns, thereby underscoring the environmental significance of the subproject.

1.1.2. Rationale for Implementation of the Subproject

The Environmental and Social Management Plan (ESMP) is a management instrument prepared for the Rehabilitation of the A0302 road section along the Arvaikheer–Bayankhongor corridor. Its purpose is to identify, assess, mitigate, monitor, and report environmental and social risks and adverse impacts that may arise during project planning, design, road rehabilitation construction, and operation.

The ESMP serves as the principal instrument for systematic environmental and social risk management throughout all phases of Project implementation. It has been prepared in compliance with applicable Mongolian laws, regulations, standards, permit conditions, and the requirements of the World Bank Environmental and Social Framework (ESF) and relevant Environmental and Social Standards (ESSs).

This ESMP is intended to:

- identify direct, indirect, and cumulative impacts that may arise from Project activities;
- define mitigation and management measures;
- establish institutional arrangements and responsibilities for implementation;
- set out monitoring and reporting mechanisms;
- ensure stakeholder engagement; and
- provide a framework for grievance management and resolution.

In preparing the ESMP, due consideration was given to the environmental impact assessment, baseline studies, social assessment finding, engineering information, designs, outcomes of

stakeholder consultations, international good practice, and the environmental and social conditions in the project area.

1.1.3. Methodology for Preparation of the Environmental and Social Management Plan

The ESMP was prepared based on a comprehensive consideration of the Project scope, location, engineering design, construction sequencing, seasonal characteristics, environmentally and socially sensitive receptors likely to be affected, and the local development context.

The methodology included review and analysis of project design documents, technical documentation, baseline study materials, legal and policy documents, together with the consolidation of field measurements, observations, sampling data, and information collected through stakeholder inputs, questionnaires, and interviews. Following this, environmental and social risks and impacts were identified for each type of project activity and evaluated taking into account their significance, scale, duration, and sensitivity.

Mitigation hierarchy approach defined by ESF is: (a) Anticipate and avoid risks and impacts where feasible; (b) Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels; (c) Once risks and impacts have been minimized or reduced, mitigate; and (d) Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible.

Accordingly, this ESMP is a risk- and impact-based management instrument intended to guide the planning, implementation, monitoring, and continuous improvement of the environmental and social performance of the subproject.

1.2. Technical design and engineering planning of the subproject

1.2.1. Project Scope

The subproject will be implemented on a 35.82 km section of the A0302 national road, extending from Km 14+800 to Km 50+620, and traversing the territory of Bag 2 (Arvaintal) of Taragt soum and Bag 3 (Emeeltt) of Khairkhandulaan soum**,** Uvurkhangai province**.**

To improve organizational efficiency, construction supervision, and traffic safety management, the Rehabilitation works will be divided into work sections of approximately 5 km each and implemented in 7 work fronts on a phased basis. This arrangement will enable more efficient sequencing of activities, better utilization of machinery and workforce, and phased traffic management throughout the construction period.

The principal technical parameters of the subproject are as follows:

- **Road type:** National road with asphalt concrete pavement;
- **Total length:** 35.82 km;
- **Implementation period:** 24 months;
- **Workforce:** 6 to 197 workers, depending on the season and stage of construction;
- **Material supply:** 8 quarries to be used for Project needs, comprising 4 soil quarries and 4 rock quarries;

- **Main work items:** major pavement rehabilitation; partial and, where required, full renewal of base layers; repair of embankments and shoulders; rehabilitation of drainage structures; improvement of road signs and markings; and upgrading of access roads, entrances/exits, and intersection arrangements.

The main construction activities under the subproject include removal and replacement of damaged pavement sections, partial and, where necessary, full rehabilitation of road base layers, improvement of embankment, shoulder, and slope stability, rehabilitation and replacement of culverts, drains, and ditches, installation and upgrading of road signs, markings, and safety devices, as well as improvement of traffic arrangements at access points, entrances/exits, and intersections.

The main categories of road rehabilitation works and the associated potential environmental and social risks and adverse impacts are summarized in *Table 2.*

Table 2. Main Construction Activities under the Project and Associated Potential Environmental and Social Impacts

No.	Activity Category	Main Construction Activities	Potential Environmental Impacts	Potential Social Impacts
1	Earthworks	Removal of existing pavement, excavation and replacement of base material, embankment leveling, compaction, shoulder restoration, construction of temporary roads	Dust generation, soil disturbance, erosion, loss of vegetation cover, sediment runoff	Noise, traffic safety risks, temporary traffic disruption, community access restrictions
2	Asphalt production and paving works	Receipt of raw materials, drying, mixing, transportation, laying, compaction	Air emissions, smoke, odor, fuel consumption, noise, risk of spills and contamination	Traffic delays, occupational health and safety risks for workers, community nuisance impacts
3	Drainage works	Replacement and installation of culverts, repair of channels and ditches, flow diversion, slope protection	Impacts on surface water flow and drainage patterns, soil erosion, sediment dispersion, localized flooding risks	Construction-stage traffic safety risks, temporary access disruption
4	Quarry operation	Extraction of soil, gravel, and crushed stone, temporary stockpiling, transportation, rehabilitation of quarry sites	Land degradation, dust, noise, landscape alteration, habitat disturbance	Potential conflict with local communities, increased road traffic load, community safety concerns
5	Workers' camp operations	Accommodation, kitchen facilities, sanitation, water supply, wastewater disposal, waste management	Solid waste generation, wastewater discharge, spills, local environmental contamination	Social interaction impacts, labor influx risks, community health and safety risks, GBV/SEA/SH risks, hygiene concerns

6	Material storage and warehousing	Storage of aggregate, sand, cement, bitumen, chemical additives, establishment of temporary warehouses	Dust, spills, soil and water contamination	Worker safety risks, fire hazards, visual impacts
7	Winter works (if required)	Excavation in frozen ground, maintaining paving temperature, snow and ice clearance	Risks to base quality, increased fuel and energy consumption	Road safety risks, more difficult working conditions, increased accident risk

As the subproject involves rehabilitation and upgrading of an existing local road corridor rather than construction of a new alignment, the adopted design approach focuses on improving the climate resilience, safety, and serviceability of the existing infrastructure under current and projected climatic conditions within the project area.

In addition, the ESMP incorporates mitigation measures aimed at minimizing greenhouse gas (GHG) emissions during construction activities through efficient material transportation planning, controlled fuel and equipment management, dust control, and rehabilitation of disturbed areas following construction. While the overall project-level GHG assessment is presented in the ESMF, the subproject-specific mitigation measures included in the ESMP are intended to support reduction of localized environmental impacts and improve long-term infrastructure sustainability.

The climatic baseline assessment confirms that the project area is characterized by harsh continental climatic conditions, including significant seasonal temperature fluctuations, increasing warming trends, periodic drought, strong winds, dust storms, and localized heavy precipitation events during the warm season. Long-term climate observations indicate an increase in average temperature of approximately 1.5°C in Khairkhandulaan soum and 1.8°C in Taragt soum between 1961 and 2019, reflecting the broader regional impacts of climate change.

These climatic and environmental conditions were taken into consideration during the road rehabilitation planning and design process to ensure the long-term durability, operational safety, and climate resilience of the subproject road section. In particular, the design and construction methodology incorporates measures intended to reduce vulnerability to climate-related risks such as seasonal flooding, erosion, freeze-thaw cycles, heavy precipitation, dust storms, and extreme winter conditions (including dzud-related impacts on transport accessibility).

The engineering approach includes:

- Rehabilitation and strengthening of existing road embankments and pavement structure to improve resistance to temperature variability, frost action, and seasonal degradation;
- Provision and rehabilitation of drainage structures, culverts, and surface runoff management systems to reduce risks associated with localized flooding, erosion, and intense rainfall events;
- Slope stabilization and erosion protection measures in vulnerable sections to minimize soil loss and infrastructure deterioration during extreme weather conditions;
- Dust suppression and surface management measures appropriate for the dry steppe and semi-arid climatic conditions of the project area;
- Construction scheduling and operational planning adapted to seasonal climatic constraints, including winter conditions and periods of high wind activity.

1.2.2. Traffic Level of Service

The traffic conditions on the Project road were assessed using the Level of Service (LOS) classification. LOS is an indicator used to evaluate road operating conditions and safety based on parameters such as traffic flow, stability of operation, speed, density, driver maneuverability, and level of delay. This classification is important for determining traffic management arrangements, temporary road use, and safety measures during construction.

Based on the Highway Capacity Manual**,** LOS is classified from A to F, where LOS A represents free-flow conditions and a high level of service, while LOS F represents oversaturated conditions with congestion and operational failure.

Table 3. Traffic Level of Service

LOS	Level	Traffic Volume (vehicles/hour/lane)	Density (vehicles/km/lane)	Description of Traffic Conditions
A	Very low traffic	<200	≤7	Free-flow conditions; drivers have full control of vehicle operation; high speeds; overtaking is unrestricted
B	Low	200-400	7-11	Stable flow; density increases slightly, but driver comfort and maneuverability remain adequate
C	Moderate	400-800	11-16	Flow remains stable, but operational constraints begin to be noticeable and driver choice becomes more limited
D	High	800-1200	16-22	Flow becomes less stable; maneuverability is limited; the risk of delay increases
E	Very high	1200-2000	22-28	Operating conditions are at or near road capacity; even minor disturbances can significantly affect flow
F	Oversaturated	>2000	>28	Congestion, stop-and-go traffic, and interrupted flow; the level of service is unacceptable

Source: Prepared with reference to the Highway Capacity Manual (Transportation Research Board).

A preliminary assessment of traffic conditions along the Project corridor indicates that the sections requiring Rehabilitation and exhibiting a high degree of deterioration are likely to operate at **LOS D-E**, while other sections are likely to operate at **LOS C-D**. These conditions indicate that detailed planning will be required for temporary traffic schemes, speed restrictions, warning signs, traffic safety barriers, signaling, and other traffic control measures during construction.

In addition, traffic volumes vary seasonally. In particular, during July, travel demand tends to increase significantly due to tourism, national holiday travel, and increased movement from

Ulaanbaatar to rural areas. Accordingly, construction scheduling for this period should be closely coordinated with specific traffic management measures.

1.2.3. Project Technical Design

The major and partial road rehabilitation works to be implemented under the Project will be carried out in accordance with defined stages, construction sequences, and technical solutions. It is therefore necessary to present, in an integrated manner, the scope, categories, and quantities of the works to be undertaken.

Table 4 below presents information on the Project's principal and ancillary work activities, temporary facilities and services, and the technical resources required for implementation.

Table 4. Main Types and Quantities of Project Works

No.	Work Item	Unit	Quantity	Daily Production Rate	No. of Working Days
	General				
1	Detailed design	L.S.	1	0.01	83
2	Quality control plan	L.S.	1	0.01	140
	Construction and Installation				
3	Engineer's Representative facilities	L.S.	1	0.02	50
4	Contractor's facilities	L.S.	1	0.01	249
5	Installation of plants and equipment	L.S.	1	0.03	30
	Site Clearance				
6	Removal of existing road signs	No.	18	48.67	0
7	Removal of existing kilometer posts	No.	31	22.86	1
8	Removal of existing guardrails	m	540	1460	0
9	Removal of existing stone protection on embankment side slopes	m^2	1,008	50.16	20
	Road Alignment Reinstatement				
10	Road alignment reinstatement	km	35.82 .8	2.09	17
	Earthworks				
11	Establishment of borrow area	m^3	388	379.95	10
12	Rehabilitation of borrow area	m^3	11,362.68	367.19	31
13	Construction of temporary access from borrow area to structures	m^3	10	0.45	22
14	Construction of temporary road	m^3	64,400	2,918.19	22
15	Leveling and compaction of subgrade	m^3	94,537.86	852.96	112
16	Excavation and removal of unsuitable materials	m^3	285,326.26	2,574.32	112
17	Blasting works	m^3	60,434.73	545.26	112
18	Embankment construction using hauled material	m^3	91,174.24	845.17	109
19	Stockpiling of existing asphalt concrete pavement at the recycling plant site	m^3	33,952.99	306.34	112
20	Loading of recycled materials by loader	m^3	33,952.99	306.34	112

21	Benching of existing embankment side slopes	m³	2,657,487	306.34	109
Base Works					
22	Construction of frost protection layer	m³	96,847.92	914.49	107
23	Construction of cement-treated base course	m³	43,894.85	1,125.51	61
24	Cold recycling of the existing asphalt concrete pavement with 4–6% cement stabilization	m³	25,825.39	1,120.17	23
25	Construction of bitumen-treated crushed stone base course	m³	7,732.63	509.92	15
Pavement Works					
26	Construction of wearing course asphalt concrete pavement	m³	10,085.59	278.86	222
27	Construction of base course asphalt concrete pavement	m³	8,292.33	208.24	40
28	Construction of gravel shoulders	m³	35.82 ,956.49	300	300

Pavement Structure

Table 5. Road Geometric Design Parameters

Terrain Slope Type	Surface Slope (%)
Flat terrain (L)	0–5%
Rolling terrain (R)	5–12%
Mountainous terrain (M)	>12.5%

Drainage Structures

The locations, types, and dimensions of drainage structures were designed using topographic survey data and empirical methods, in accordance with applicable standards and regulations in Mongolia. Hydraulic structures at bridge and culvert locations serving major catchment areas were designed on the basis of hydrological calculations. Surface runoff will be drained through a 2.0% pavement crossfall and conveyed via roadside ditches and hillside drains for safe collection and discharge.

Sections 1 and 2


Sections 3 and 4

Figure 1. Existing condition of drainage culverts, Sections 1 and 2 , Existing condition of drainage culverts, Sections 3 and 4

The drainage works under the Project will include construction of new culverts, removal of structurally deteriorated sections, replacement and modification of existing structures, and repair works.

The proposed drainage channel will comprise a trapezoidal stone masonry section with 20 cm thick cement mortar bedding**.** Construction and installation works will be carried out in the following sequence:

1. **Pre-excavation survey and setting out :**Prior to commencing excavation of the drainage channel, measurements will be undertaken to establish the plan alignment of the channel centerline and the existing ground elevations. Excavation of the foundation trench will be carried out mechanically, after which the channel bed will be manually trimmed and leveled to conform to the design dimensions and gradient.
2. **Foundation preparation and stone masonry works :**Upon acceptance of the channel foundation works, stone masonry in cement mortar will be executed. A 10 cm thick gravel bedding layer will be placed on the channel bed and sidewalls, followed by a cement mortar layer, on top of which 20 cm thick stone masonry will be constructed in accordance with the design. For the trapezoidal channel, M10 grade cement mortar will be used, ensuring that mortar joints are completely filled. The stone used shall have a compressive strength of not less than 40 MPa**.**
3. **Execution of masonry works :**Prior to use, the stones will be pre-wetted and cleaned of any surface contamination. Mortar will be placed by pressing method and positioned on the bedding layer at the design elevation. Larger stones will be placed in the lower portion of the foundation, with their flatter surfaces facing downward. The mortar consistency will be adjusted to a slump of 30–50 mm**.**
4. **Curing and moisture control :**During and after the masonry works, watering and moisture control measures will be applied to ensure proper bonding and strength development of the cement mortar. Curing shall be undertaken for a period of not less than seven days**.**

1.2.4. Workforce Composition

During project implementation, the total workforce will comprise up to 197 workers, with local workers employed to the greatest extend possible. The works will be executed in 7 work sections.

The contractor's workforce will be led by a qualified Chief Engineer**,** and the staffing plan of the contracting entity is presented in Table 6 below.

Table 6. Workforce Planning

No.	Position	No. of Personnel	Main Responsibilities	Duration
Planning and Design Department				
1	Chief Engineer	1	Overall project leadership; supervision of team performance, quality, and safety	14 months
2	Project Manager	1	Day-to-day management of project operations; oversight of performance, schedule, and resource utilization	14 months
3	Project Secretary	1	Registration and maintenance of official correspondence and records	10 months
4	Translator/Interpreter	1	Professional translation of project documents and communications; ensuring mutual understanding of information	14 months
5	Project Coordinator	1	Coordination among stakeholders and facilitation of workflow	14 months
6	Contract Manager	1	Oversight of contract implementation, compliance with obligations, and risk management	14 months
Design and Planning Department				
7	Design Manager	1	Management of design activities; ensuring design solutions, coordination, and standards compliance	14 months
8	Design Quality Specialist	1	Review of design quality and compliance with standards and technical norms	14 months
9	Geotechnical Design Specialist	1	Development of solutions based on soil and geotechnical investigations	14 months
10	Materials Specialist	1	Ensuring suitability, requirements, and quality compliance of construction materials	14 months
11	Survey Engineer	1	Carrying out project measurements and calculations; ensuring accuracy	14 months
Engineering and Technical Personnel				
12	Social Impact Assessment Specialist, CLO	1	Assessment of social impacts and planning of mitigation measures, community liason	12 months
13	Construction Manager	1	Management of construction works; ensuring performance, quality, and safety	14 months
14	Social Safeguards Specialist / SEA/SH Prevention Specialist	1	Implementation of social protection measures and prevention of associated risks	12 months
15	Geomatics/Geodetic Engineer	1	Responsible for geodetic survey measurements and data processing	14 months
16	Senior Site Engineer	1	Site management and supervision of construction performance	13 months

17	Senior Materials Engineer	1	Oversight of material quality, testing, and usage	—
18	Planning Engineer	1	Preparation of work plans and schedules; monitoring implementation	14 months
19	Chief Survey Engineer	1	Management and coordination of survey works	—
20	Quantity Engineer	1	Preparation of work measurements, cost estimates, and quantity calculations	14 months
21	Drafting Engineer	1	Preparation and updating of technical drawings	14 months
22	Site Engineer	4	Implementation and supervision of field works	16 months
23	Site Foreman	1	Ensuring work execution and workforce organization	10 months
24	Trip Counter	3	Recording and counting transport movements and haul trips	8 months
25	Site Assistant	11	Performance of auxiliary site works	17 months
26	Bridge/Structural Engineer	1	Supervision of bridge and structural works methods and execution	6 months
27	Culvert Works Assistant	20	Support to culvert and pipe installation works	5 months
28	Pavement Engineer	1	Supervision of pavement construction methods and quality	4 months
29	Paving Foreman	1	Organization and execution of paving works	4 months
30	Paver Assistant	6	Support to paving operations	4 months
31	Survey Engineer	1	Measurements, setting out, and data processing	10 months
32	Survey Technician	2	Technical execution of survey activities	10 months
33	Survey Assistant	2	Support to survey works	10 months
34	Materials Engineer	1	Material testing and quality control	10 months
35.82	Laboratory Technician	2	Laboratory testing and analysis	10 months
36	Materials Assistant	2	Support to materials control activities	10 months
Occupational Health, Safety and Environment (OHSE)				
37	HSE Manager	1	Management of occupational safety, health, hygiene, and environmental performance	12 months
38	HSE Officer	1	Implementation of safety supervision and toolbox instructions	11 months
39	Environmental Specialist	1	Implementation of environmental monitoring and protection measures	11 months
40	Occupational Health Physician	1	Oversight of worker health and sanitary conditions	11 months
Camp Facilities				
41	Camp Manager	1	Management of camp operations and welfare services	14 months
42	Camp Electrician	1	Responsible for electrical system operation and maintenance	14 months
43	Head Cook	1	Management of food preparation services	14 months
44	Assistant Cook	1	Support to food preparation	14 months

45	Kitchen Preparation Worker	1	Preparation of raw food materials	14 months
46	Laundry Worker	1	Washing and sanitizing workers' clothing	14 months
47	Security Guard	1	Ensuring camp security	14 months
Finance				
48	Road Economist	1	Oversight of project economic calculations, efficiency, and budget	12 months
49	Storekeeper	1	Responsible for inventory recording, storage, and issuance of materials	13 months
	Plants			
50	Asphalt Plant Workers	10	Asphalt concrete production and plant operation	7 months
51	Crusher Plant Workers	9	Crushing and processing of aggregate materials	8 months
52	CTB Plant Workers	9	Production of base material mixtures	5 months
Drivers and Operators				
53	Motor Grader Operator	2	Safe and efficient operation, use, and maintenance of machinery and equipment	15 months
54	Bulldozer Operator	2	—	10 months
55	Lifting Equipment Operator	6	—	9 months
56	Loader Operator	4	—	19 months
57	Vibratory Roller Operator	4	—	7 months
58	Dump Truck Driver	40	—	19 months
59	Pavement Cutter/Milling Machine Operator	1	—	6 months
60	Paver Operator	2	—	4 months
61	Pneumatic Tire Roller Operator	2	—	4 months
62	Steel Wheel Roller Operator	2	—	4 months
63	Bitumen Distributor Driver	1	—	4 months
64	Service Vehicle Driver	6	—	10 months
65	Trailer Driver	1	—	10 months
66	Fuel Bowser Driver	1	—	10 months
67	Water Truck Driver	7	—	10 months
68	Crane Operator	2	—	7 months
	Total Workforce	**197**		

1.2.5. Machinery, Plant and Equipment

All machinery, plant, and equipment required for the Project will be mobilized and used on a phased basis to carry out the road construction works. Equipment utilization periods have been aligned with the implementation schedule to ensure that subgrade preparation, asphalt paving, and material transport operations are performed to the required quality, safely, and within the contractual timeframe.

Table 7. Machinery, Plant and Equipment

No.	Equipment Name	Quantity	Description	Period of Use
1	Motor grader	2	Leveling road and site surfaces; preparing subgrade	15 months

2	Bulldozer	2	Pushing soil, leveling the site, preparing subgrade	10 months
3	Excavator	5	Excavation, loading, and moving material for subgrade and road works	9 months
4	Wheel excavator	1	Excavation and material handling	8 months
5	Loader	4	Loading and transporting materials	19 months
6	Vibratory roller	4	Compaction of soil, base, and pavement layers	7 months
7	Dump truck	40	Transporting and dumping materials	19 months
8	Pavement cutter / milling machine	1	Cutting and trimming existing pavement	6 months
9	Paver	2	Laying asphalt pavement	4 months
10	Pneumatic tire roller	2	Uniform compaction of pavement layers	4 months
11	Steel wheel roller	2	Compaction of base and pavement layers	4 months
12	Bitumen distributor	1	Spraying bitumen and tack coat/bonding materials	4 months
13	Concrete mixer truck	3	Transport and delivery of concrete	6 months
14	Truck	6	Transport of construction materials and equipment	10 months
15	Water truck	7	Watering roads and work areas; dust suppression	8 months
16	Fuel tanker truck	1	Supply of fuel to machinery and equipment	10 months
17	30-ton crane	1	Lifting loads and positioning equipment	6 months
18	5-ton crane	1	Lifting loads and positioning equipment	6 months
19	Road marking machine	1	Application of road markings	7 months
20	Guardrail post installer	1	Installation of road safety posts and guardrails	3 months
	Total machinery and equipment	**79**		

The contractor implementing the road rehabilitation works may, where necessary, increase the number of personnel and the quantity of equipment deployed.

1.3. PROFILE OF THE CONTRACTOR COMPANY

China First Highway Engineering Co., Ltd. (CFHEC) is a leading state-owned infrastructure construction company in the People's Republic of China and a principal subsidiary of China Communications Construction Company (CCCC). Headquartered in Beijing, the company operates internationally in the implementation of large-scale engineering projects, including highways, bridges, tunnels, and railways.

The company's core business covers the construction of roads, expressways, bridges, tunnels, railways, and urban transport systems. It is particularly recognized for applying advanced technologies and specialized experience in long-span bridges and complex tunnel engineering. The company also participates in urban development and building construction projects, with a focus on the integrated development of modern infrastructure.

CFHEC possesses high-grade contractor capacity and is specialized in major bridge and tunnel engineering, with extensive experience in both the domestic Chinese market and international markets. Under the Belt and Road Initiative, the company has implemented large-scale projects across Asia, Africa, and Europe, thereby making a significant contribution to global infrastructure development.

1.4. PROJECT SITE LOCATION INFORMATION

The Rehabilitation project for the 35.82 km paved section of the A0302 Arvaikheer–Bayankhongor road will be implemented within the territory of Taragt and Khairkhandulaan soums of Uvurkhangai province. The road alignment is located approximately 380 km southwest of Ulaanbaatar, 13 km west of Arvaikheer town, 21.5 km south of Taragt soum center, and 20.3 km east of Khairkhandulaan soum center, at an elevation of 1,721 m above sea level, within a steppe plain characterized by undulating, hummocky, and low-lying terrain.

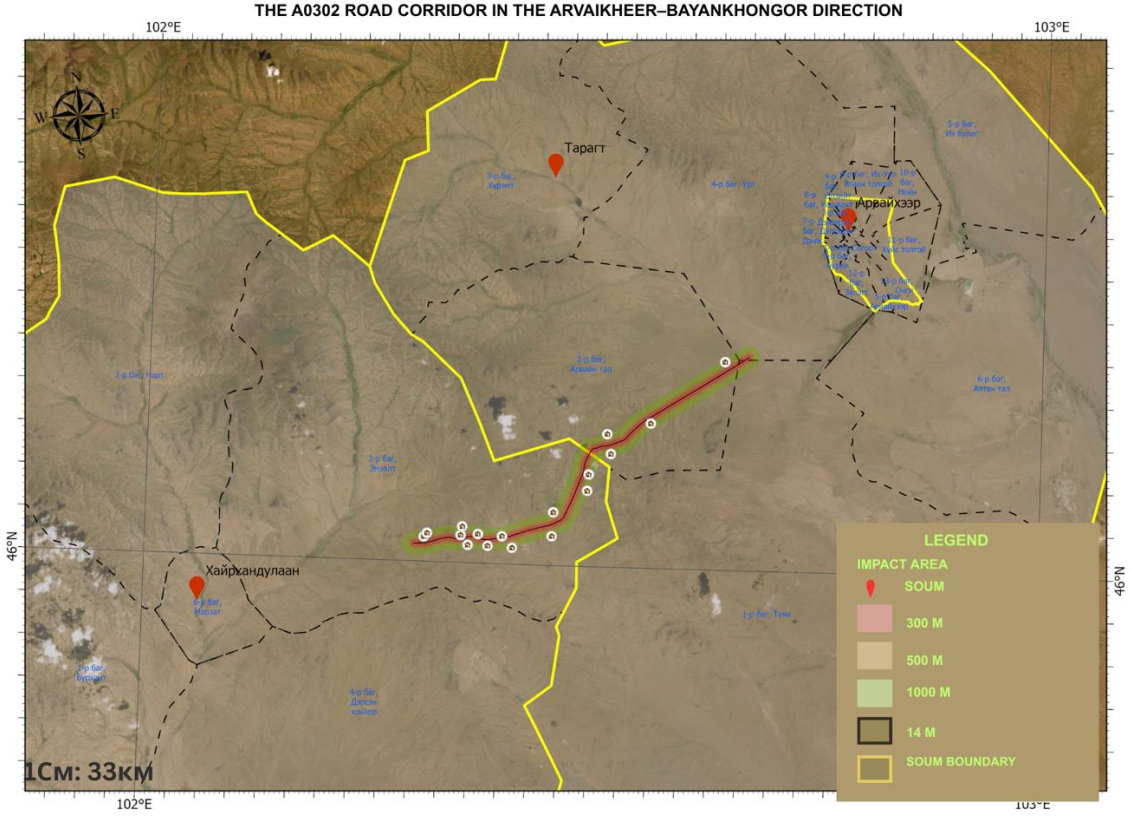
Table 8. Coordinates of the Project Road Alignment Turning Points

№	Км	X, м	Y, м	№	Км	X, м	Y, м
1	47+700.000	5099636.454	293955.291	75	49+180.000	5099275.044	292523.013
2	47+720.000	5099633.629	293935.82 . 492	76	49+200.000	5099270.156	292503.619
3	47+740.000	5099630.805	293915.692	77	49+220.000	5099265.415	292484.189
4	47+760.000	5099627.981	293895.892	78	49+240.000	5099260.778	292464.734
5	47+780.000	5099625.157	293876.093	79	49+260.000	5099256.194	292445.267
6	47+800.000	5099622.332	293856.293	80	49+280.000	5099251.620	292425.797
7	47+820.000	5099619.508	293836.494	81	49+300.000	5099247.045	292406.327
8	47+840.000	5099616.684	293816.694	82	49+320.000	5099242.470	292386.857
9	47+860.000	5099613.859	293796.894	83	49+340.000	5099237.895	292367.388
10	47+880.000	5099611.035. 82	293777.095	84	49+360.000	5099233.321	292347.918
11	47+900.000	5099608.211	293757.295	85	49+380.000	5099228.746	292328.448
12	47+920.000	5099605.386	293737.496	86	49+400.000	5099224.173	292308.978
13	47+940.000	5099602.562	293717.696	87	49+420.000	5099219.637	292289.499
14	47+960.000	5099599.738	293697.897	88	49+440.000	5099215.209	292269.995
15	47+980.000	5099596.901	293678.099	89	49+460.000	5099210.961	292250.452
16	48+000.000	5099594.005	293658.310	90	49+480.000	5099206.929	292230.863
17	48+020.000	5099590.997	293638.537	91	49+500.000	5099203.114	292211.230
18	48+040.000	5099587.824	293618.790	92	49+520.000	5099199.508	292191.558
19	48+060.000	5099584.435. 82	2935.82 99.080	93	49+540.000	5099196.052	292171.859
20	48+080.000	5099580.789	2935.82 79.415	94	49+560.000	5099192.672	292152.146
21	48+100.000	5099576.881	2935.82 59.801	95	49+580.000	5099189.329	292132.428
22	48+120.000	5099572.712	2935.82 40.240	96	49+600.000	5099186.136	292112.684
23	48+140.000	5099568.282	2935.82 20.737	97	49+620.000	5099183.249	292092.894
24	48+160.000	5099563.593	2935.82 01.295	98	49+640.000	5099180.755	292073.051
25	48+180.000	5099558.645	293481.917	99	49+660.000	5099178.657	292053.161
26	48+200.000	5099553.451	293462.603	100	49+680.000	5099176.957	292033.234
27	48+220.000	5099548.058	293443.344	101	49+700.000	5099175.592	292013.281
28	48+240.000	5099542.517	293424.127	102	49+720.000	5099174.410	291993.316
29	48+260.000	5099536.879	293404.938	103	49+740.000	5099173.268	291973.348
30	48+280.000	5099531.196	293385.762	104	49+760.000	5099172.126	291953.381
31	48+300.000	5099525.508	293366.588	105	49+780.000	5099170.985	291933.414

№	Км	X, м	Y, м	№	Км	X, м	Y, м
32	48+320.000	5099519.819	293347.414	106	49+800.000	5099169.870	291913.445
33	48+340.000	5099514.131	293328.241	107	49+820.000	5099168.796	291893.474
34	48+360.000	5099508.442	293309.067	108	49+840.000	5099167.758	291873.501
35.82	48+380.000	5099502.754	293289.893	109	49+860.000	5099166.729	291853.527
36	48+400.000	5099497.065	293270.719	110	49+880.000	5099165.714	291833.553
37	48+420.000	5099491.376	293251.545	111	49+900.000	5099164.740	291813.577
38	48+440.000	5099485.688	293232.371	112	49+920.000	5099163.831	291793.597
39	48+460.000	5099479.999	293213.197	113	49+940.000	5099162.995	291773.615
40	48+480.000	5099474.311	293194.023	114	49+960.000	5099162.207	291753.630
41	48+500.000	5099468.622	293174.849	115	49+980.000	5099161.440	291733.645
42	48+520.000	5099462.934	293155.675	116	50+000.000	5099160.676	291713.660
43	48+540.000	5099457.245	293136.501	117	50+020.000	5099159.913	291693.674
44	48+560.000	5099451.557	293117.327	118	50+040.000	5099159.149	291673.689
45	48+580.000	5099445.868	293098.153	119	50+060.000	5099158.385	291653.703
46	48+600.000	5099440.180	293078.979	120	50+080.000	5099157.616	291633.718
47	48+620.000	5099434.491	293059.805	121	50+100.000	5099156.841	291613.733
48	48+640.000	5099428.803	293040.631	122	50+120.000	5099156.066	291593.748
49	48+660.000	5099423.114	293021.457	123	50+140.000	5099155.292	291573.763
50	48+680.000	5099417.426	293002.283	124	50+160.000	5099154.517	291553.778
51	48+700.000	5099411.731	292983.111	125	50+180.000	5099153.742	291533.793
52	48+720.000	5099406.011	292963.946	126	50+200.000	5099152.968	291513.808
53	48+740.000	5099400.266	292944.789	127	50+220.000	5099152.193	291493.823
54	48+760.000	5099394.496	292925.640	128	50+240.000	5099151.418	291473.838
55	48+780.000	5099388.702	292906.497	129	50+260.000	5099150.643	291453.853
56	48+800.000	5099382.904	292887.35.82 6	130	50+280.000	5099149.869	291433.868
57	48+820.000	5099377.106	292868.215	131	50+300.000	5099149.094	291413.883
58	48+840.000	5099371.308	292849.074	132	50+320.000	5099148.320	291393.898
59	48+860.000	5099365.510	292829.933	133	50+340.000	5099147.559	291373.913
60	48+880.000	509935.829.712	292810.792	134	50+360.000	5099146.818	29135.823.926
61	48+900.000	509935.823.914	292791.651	135.82	50+380.000	5099146.097	291333.939
62	48+920.000	5099348.116	292772.509	136	50+400.000	5099145.395	291313.952
63	48+940.000	5099342.318	292753.368	137	50+420.000	5099144.696	291293.964
64	48+960.000	5099336.520	292734.227	138	50+440.000	5099143.998	291273.976
65	48+980.000	5099330.722	292715.086	139	50+460.000	5099143.299	291253.988
66	49+000.000	5099324.924	292695.945	140	50+480.000	5099142.731	291233.997
67	49+020.000	5099319.127	292676.804	141	50+500.000	5099142.470	291213.998
68	49+040.000	5099313.329	292657.662	142	50+520.000	5099142.516	291193.999
69	49+060.000	5099307.537	292638.519	143	50+540.000	5099142.870	291174.002
70	49+080.000	5099301.791	292619.363	144	50+560.000	5099143.532	291154.013
71	49+100.000	5099296.143	292600.177	145	50+580.000	5099144.501	291134.037
72	49+120.000	5099290.637	292580.950	146	50+600.000	5099145.777	291114.078
73	49+140.000	5099285.285	292561.679	147	50+620.000	5099147.339	291094.139
74	49+160.000	5099280.087	292542.366	148	50+620.000	5099147.339	291094.139

№	Км	X, м	Y, м	№	Км	X, м	Y, м

ROUTE ALIGNMENT MAP FOR THE PROJECT FOR MAJOR REHABILITATION OF THE 35 KM SECTION OF THE A0302 ROAD CORRIDOR IN THE ARVAIKHEER–BAYANKHONGOR DIRECTION



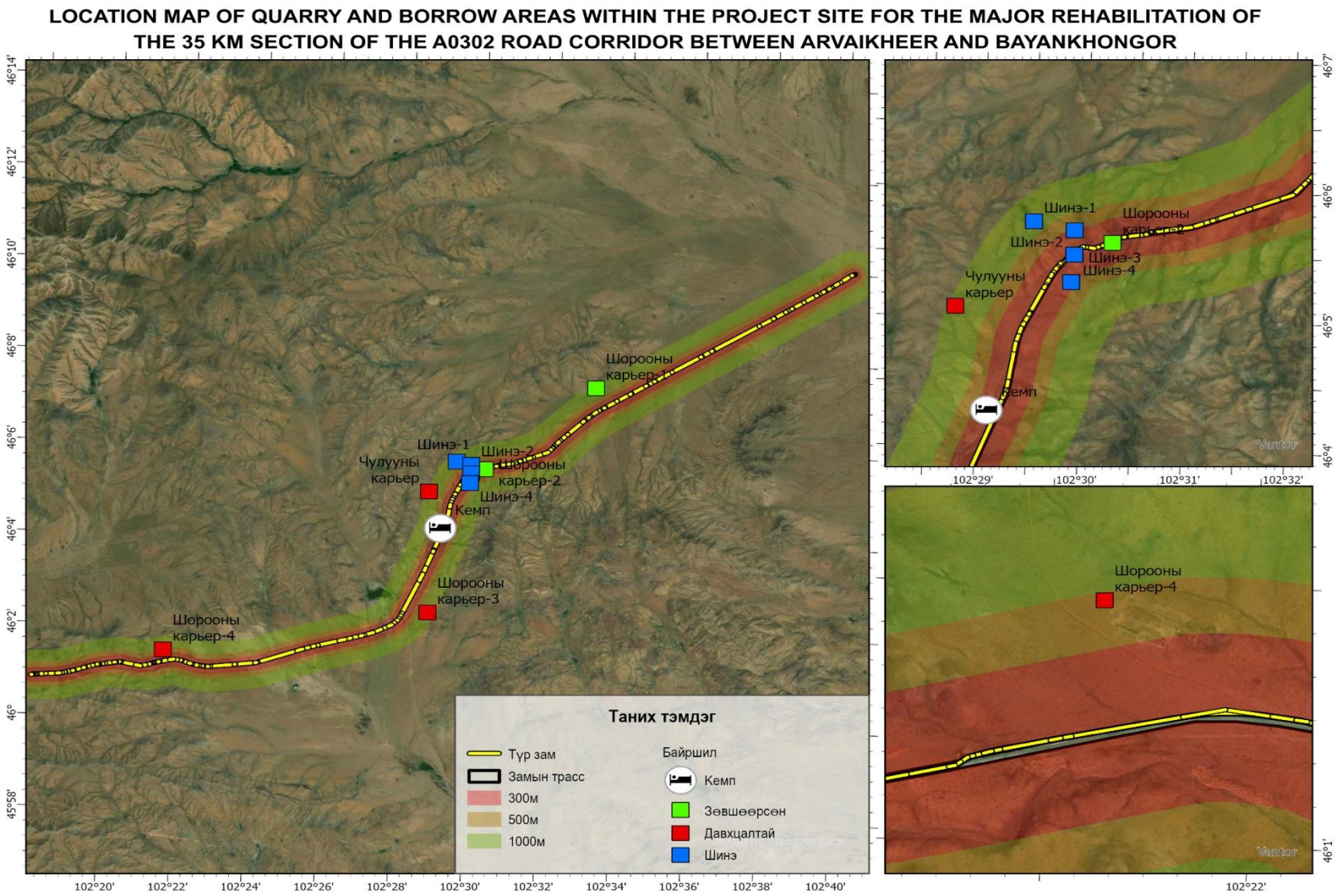


Figure 2. Location Map of the Project Site Figure 3. Location map of quarry and borrow areas

Table 9. Consolidated table of project locations

Site Type	Point No.	X	Y	Location	Period of Use
Road alignment	-	Km 47+700 – Km 83+520		Traverses the territory of Khairkhandulaan and Taragt soums, Uvurkhangai province; located 13.8 km from Arvaikheer soum center	17 months
Workers' camp	1	305531.315	5105029.462	Soum: Khairkhandulaan \nDistance from soum center: 34.9 km \nDistance from road alignment: 0.14 m	
	2	305503.798	5105038.193		
	3	305515.969	5105076.823		
	4	305545.602	5105066.504		
Soil quarry-1	1	311016.301	5110604.654	Soum: Taragt \nDistance from soum center: 21.5 km \nDistance from road alignment: 0.7 km	
	2	310973.651	5110722.088		
	3	311032.963	5110792.773		
	4	311098.541	5110691.723		
Soil quarry-2	1	306627.469	5107253.376	Soum: Taragt \nDistance from soum center: 23.7 km \nDistance from road alignment: 0.04 km	
	2	306599.427	5107272.431		
	3	306733.300	5107360.768		
	4	306877.116	510735.82 2.715		
	5	306393.068	5107393.758		
	6	307190.316	5107486.386		
	7	307396.235.82	5107521.601		
	8	307396.927	5107497.633		
	9	307193.677	5107462.710		
	10	307090.496	5107409.019		
	11	306882.246	5107331.720		
	12	306738.484	5107334.737		
Rock quarry-1	1	306701.742	5105325.949	Soum: Khairkhandulaan \nDistance from soum center: 36.14 km \nDistance from road alignment: 0.9 km	
	2	306789.589	5105384.911		
	3	306707.562	5105511.049		
	4	306443.937	5105334.060		
Rock quarry-2	1	306239.901	5105680.249	Soum: Khairkhandulaan \nDistance from soum center: 35.82 .82 km \nDistance from road alignment: 0.38 km	
	2	306216.461	5105619.264		
	3	306071.909	5105809.107		
	4	305876.661	5105753.545		
Rock quarry-3	1	306643.217	5104833.441	Soum: Khairkhandulaan \nDistance from soum center: 35.82 .94 km \nDistance from road alignment: 0.97 km	
	2	306724.283	5104676.416		
	3	306899.107	5104763.676		
	4	306774.072	5104891.163		
Rock quarry-4	1	306677.331	5105233.963	Soum: Khairkhandulaan \nDistance from soum center: 36.09 km \nDistance from road alignment: 0.88 km	
	2	306759.362	5105107.825		
	3	306934.097	5105195.088		
	4	306830.567	5105321.899		

Figure 4. Exiting condition of the A0302 road

CHAPTER 2. ENVIRONMENTAL BASELINE CONDITIONS OF THE SUBPROJECT AREA

The environmental baseline assessment is intended, at the initial stage of preparing this subproject and the related development policies, programs, and plans, to comprehensively characterize the environmental conditions of the area where they will be implemented. This includes, inter alia, the geographic setting, geological structure, climate, air quality, surface water and groundwater, soil cover, vegetation cover, fauna, and the current condition of historical and cultural heritage.

This road Rehabilitation project will be implemented within the territory of Arvaikheer, Taragt, and Khairkhandulaan soums of Uvurkhangai province**,** while the road corridor itself falls within Bag 2 (Arvain Tal) of Taragt soum and Bag 3 (Emeeltt) of Khairkhandulaan soum**.** Accordingly, the environmental baseline conditions of the project area have been defined within the boundaries of these territories.

2.1. Physical geographic conditions

2.1.1. Relative Location

Uvurkhangai province borders Arkhangai province to the north**,** Bulgan and Tuv provinces to the northeast**,** Dundgovi province to the east**,** Umnugovi province to the south**,** and Bayankhongor province to the west**.** The total length of its administrative boundary is 1,265 km**.** The province center**,** Arvaikheer, is located 433 km from Ulaanbaatar. The southernmost point of the province is 166 km from the state border, and the province is one of the seven provinces that do not share an international border.

2.1.2. Geographic Location of the Project Area

Khairkhandulaan and Taragt soums of Uvurkhangai province, where the Project is being implemented, are located in the central part of Mongolia, in the southwestern part of Uvurkhangai province. Both soum s lie within the transition zone between the southern foothills of the Khangai Mountain Range and the steppe zone.

1. Geographic location of Khairkhandulaan soum

- Location: Approximately 60 km southwest of the province center, Arvaikheer.
- Physiographic setting: Hilly and undulating plain zone along the southern foothills of the Khangai Mountains.
- Elevation: 1,700-1,950 m above sea level.
- Characteristics: Dominated by mountainous landforms, rolling plains, and low-lying valleys with predominantly grazing land. Water resources consist of seasonal rivers, streams, springs, and seepages.

2. Geographic location of Taragt soum

- Location: Approximately 90 km southwest of Arvaikheer.
- Physiographic setting: Transitional zone from the Khangai mountainous area to dry steppe and Gobi plain.
- Elevation: 1,600-1,900 m above sea level.
- Characteristics: Low mountains, valleys, and steppe climate predominate. The area has pastureland suitable for livestock husbandry. The territory is vulnerable to wind and aridity.

The project road alignment traverses these two soums and is located at an absolute elevation of 1,821.3 to 2,193.3 m above sea level, with terrain slope gradients ranging from 0 to 9.2 degrees.

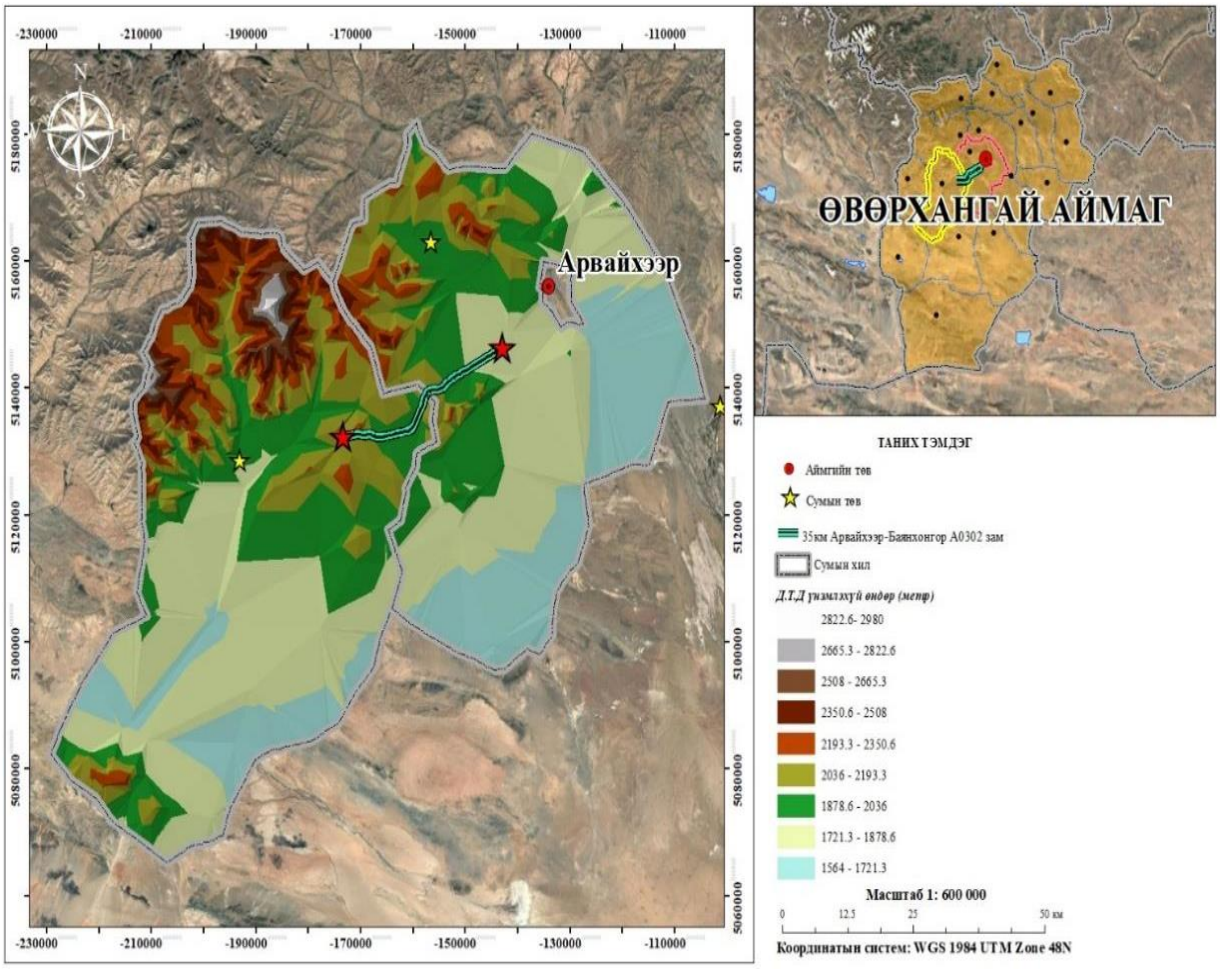


Figure 5. Physical Geography of the Project Area

2.2. CLIMATE

2.2.1. Climatic Conditions

Khairkhandulaan and Taragt soums are located in the central part of Mongolia, in the southwestern part of Uvurkhangai province, and fall within the mountainous and rolling plain zones along the southern foothills of the Khangai Mountains, as well as the transition zone between steppe and dry steppe.

- **Khairkhandulaan soum**: Located at an average elevation of 1,700-1,950 m above sea level, characterized by mountainous and rolling terrain, with long, cool winters and short summers with relatively higher moisture.
- **Taragt soum**: Located at an elevation of 1,600-1,900 m above sea level, characterized by low mountains, valleys, and predominantly dry steppe, with long and drier winters, hotter summers, and lower precipitation.

The climate of these soums is characterized by a **harsh continental regime**, with pronounced seasonal variation, significant fluctuations in air temperature, low precipitation, and uneven distribution of precipitation throughout the year.

2.2.2. Air Temperature

Long-term annual average temperature

- Khairkhandulaan: approximately -1°C (predominantly cool mountainous conditions)
- Taragt: approximately 0 to +1°C (relatively warmer dry steppe conditions)

Winter season (November-April)

- Khairkhandulaan: average temperature in January ranges from -20 to -25°C, reaching -25 to -30°C in higher elevations.
- Taragt: average temperature in January ranges from -15 to -22°C, and around -18°C in valley areas.

Summer season (June-August)

- Khairkhandulaan: average temperature in July is 15-18°C.
- Taragt: average temperature in July is 17-20°C, with temperatures reaching +32 to +34°C in some years.

Temperature variability

The difference between average winter and summer temperatures reaches 35.82 -40°C**.**

Warming trend

Between 1961 and 2019**,** average temperature increased by approximately 1.5°C in Khairkhandulaan and 1.8°C in Taragt**.**

2.2.3. Precipitation

The average annual precipitation in the territory of Khairkhandulaan and Taragt soums is approximately 200-320 mm, of which:

- Khairkhandulaan: 250-320 mm (85% falls between April and September)
- Taragt: 200-280 mm (80-85% falls during the warm season)

Approximately 80-85% of annual precipitation occurs during the warm season from April to September**.** Peak precipitation occurs from mid-June to mid-August. Winter snowfall is relatively limited, with snow cover thickness of approximately 2-5 cm in steppe areas and 5-10 cm in mountainous areas**.**

2.2.4. Air Pressure

- During winter, high-pressure conditions dominate **(**850-854 hPa), while in summer lower pressure conditions prevail **(**840-845 hPa**).**
- Although west-to-east air flow predominates, mountainous topography influences wind direction, resulting in localized variation in valleys and gullies.
- During spring and autumn, air pressure fluctuates significantly, with frequent passage of cyclones and anticyclones.

2.2.5. Wind

- Prevailing direction: winds from the west, north, and northwest predominate.
- Average annual wind speed: approximately 4 m/s in Khairkhandulaan and 5-6 m/s in Taragt.

Frequency of dust storms

- Khairkhandulaan: 10-20 days per year

- Taragt: 25-40 days per year, reaching up to 50 days during particularly dry periods

Wind speeds are generally lower in winter, while spring and autumn are the windiest seasons.

2.2.6. Climatic Zone Classification

- Khairkhandulaan: semi-arid cool steppe zone, strongly influenced by the southern edge of the Khangai Mountains
- Taragt: dry steppe and Gobi-steppe transition zone, characterized by greater warmth and higher aridity

2.3. Air quality

2.3.1. Objective of the Study

The air quality assessment was conducted to establish the baseline ambient air quality conditions within the road Rehabilitation project area and to provide reference data for comparison with potential changes in dust generation and air pollutant concentrations during the construction phase. Measurements were carried out as cross-sectional spot measurements at selected monitoring locations in accordance with the general requirements for air sampling.

2.3.2. Methodology

Field measurements were conducted on 31 August 2025 and 4 September 2025 at four locations along the project alignment. Particulate matter was measured using Aeroqual Series 500 and DustTrak direct-reading instruments, while gaseous pollutants were measured using Aeroqual Series 500 and an MS6300 Environment Multimeter. The results were evaluated against the relevant permissible limits under MNS 4585:2025, Air Quality – General Technical Requirements.

2.3.3. Monitoring Locations

Table 10. Air Quality Monitoring Locations

point No.	longitude	Latitude
1	102°39'11.93"	46°09'33.57"
2	102°35.82 '35.82 .30"	46°07'54.65"
3	102°33'17.05"	46°06'47.53"
4	102°27'33.72"	46°01'51.82"

2.3.4 Particulate Matter Measurement Results

Concentrations of PM_{10} and $PM_{2.5}$ were assessed within the project influence area. According to the measurement results, PM_{10} concentrations did not exceed the permissible limit specified in MNS 4585:2025. The maximum $PM_{2.5}$ concentration recorded was 10 µg/m³, measured at Point 4. These results indicate that fine particulate concentrations in the project area remained below the applicable standard during the monitoring period.

As the point-specific PM_{10} values are not presented in the source dataset, the result is reported in this section as in accordance with the original measurement record.

Table 11. Particulate Matter Measurement Results

Parameter	Measured Result	Unit	Assessment against Standard
PM_{10}	Within standard	µg/m³	Did not exceed the 24-hour permissible limit under MNS 4585:2025
$PM_{2.5}$	10 (maximum)	µg/m³	Equivalent to 26.7% of the 24-hour permissible limit under MNS 4585:2025

2.3.5. Gaseous Pollutant Measurement Results

Ambient concentrations of nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and carbon monoxide (CO) were measured within the project area. The measured NO_2 concentration ranged from 24 to 32 µg/m³**,** while the CO concentration ranged from 1,35.82 6 to 1,695 µg/m³**.** Both parameters remained below the applicable permissible limits.

The original SO_2 record contained a negative value. As a negative concentration is not physically meaningful, this result has been interpreted and reported in the final text as “not detected” **or** “below the limit of detection (<LOD)”**.**

The measured NO_2 range corresponds to 48.0–64.0% of the 24-hour permissible limit under MNS 4585:2025, while the measured CO range corresponds to 33.9–42.4% of the applicable 24-hour limit. These values indicate that gaseous pollutant concentrations remained below the relevant standard levels at the time of measurement.

Table 12. Gaseous Pollutant Measurement Results

Parameter	Measured Range / Result	Unit	Assessment against Standard
Nitrogen dioxide (NO_2)	24–32	µg/m³	48.0–64.0% of the 24-hour permissible limit under MNS 4585:2025
Sulfur dioxide (SO_2)	Not detected / <LOD	µg/m³	Did not exceed the applicable standard
Carbon monoxide (CO)	1,35.82 6–1,695	µg/m³	33.9–42.4% of the 24-hour permissible limit under MNS 4585:2025

2.3.6. Comparison with Applicable Standards

Comparison of the measurement results with the relevant permissible limits of MNS 4585:2025 indicates that $PM_{2.5}$, NO_2, and CO concentrations were below the applicable standard values. PM_{10} was also reported as compliant with the standard in the original measurement record. For SO_2, the negative raw entry was treated as a reporting anomaly and has been presented as not detected / below the limit of detection in the final interpretation.

As the survey was based on spot measurements, the comparison with 24-hour standard values should be interpreted as a baseline screening assessment rather than a full compliance determination based on continuous or time-integrated monitoring.

Table 13. Comparison of Measurement Results with MNS 4585:2025

Parameter	Measured Result	MNS 4585:2025 Standard	Ratio	Conclusion
$PM_{2.5}$	10 µg/m³	37.5 µg/m³	26.7%	Within standard
PM_{10}	Within standard	100 µg/m³	-	Within standard
NO_2	24–32 µg/m³	50 µg/m³	48.0–64.0%	Within standard
SO_2	Not detected / <LOD	50 µg/m³	-	Within standard
CO	1,35.82 6–1,695 µg/m³	4,000 µg/m³	33.9–42.4%	Within standard

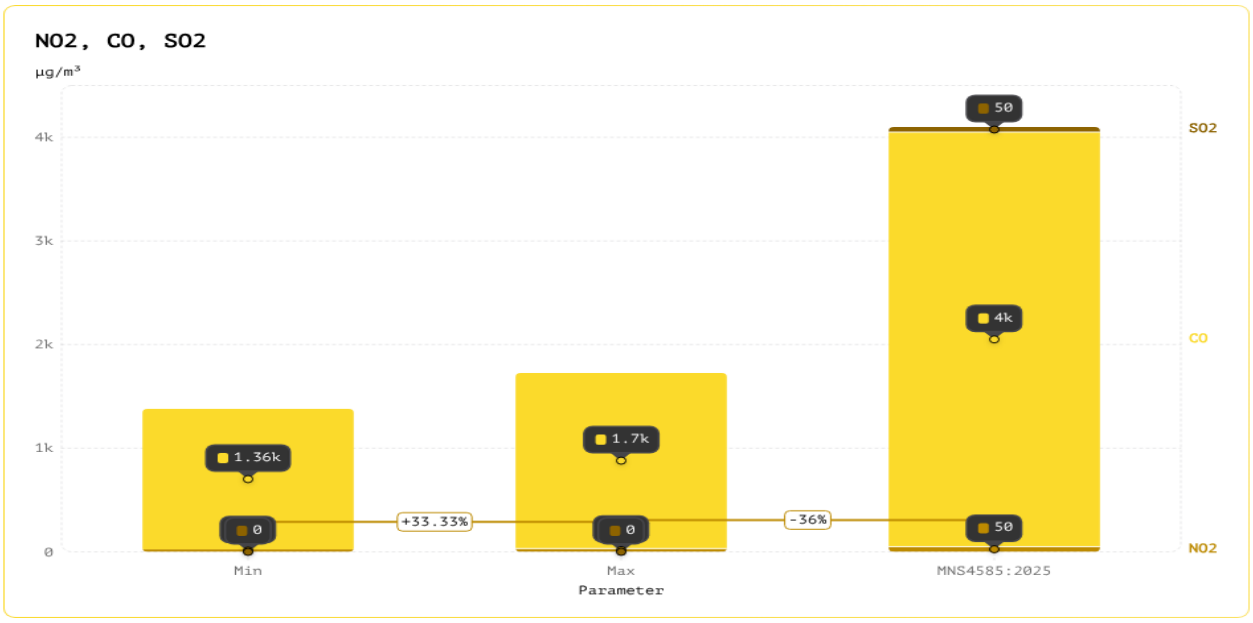
Table 14. Data for $PM_{2.5}$

Parameter	Value	Unit
Maximum measured $PM_{2.5}$ concentration	10.0	µg/m³
MNS 4585:2025 standard for $PM_{2.5}$	37.5	µg/m³

Table 15. Data for Gaseous Pollutant

Parameter	Minimum Measured Value	Maximum Measured Value	MNS 4585:2025 Standard	Unit
NO_2	24	32	50	µg/m³
CO	1,35.82 6	1,695	4,000	µg/m³
SO_2	0*	0*	50	µg/m³

The original negative SO_2 value was interpreted during data processing as not detected/below the limit of detection; therefore, it may be presented as 0 or ND in charts.



Graph 1. Air quality measurement

Based on air quality measurements conducted at four monitoring points on 31 August 2025 and 4 September 2025, the baseline ambient air quality within the project area was found to be within the applicable standard limits. The maximum $PM_{2.5}$ concentration was 10 µg/m³, NO_2 concentrations ranged from 24 to 32 µg/m³, and CO concentrations ranged from 1,35.82 6 to 1,695 µg/m³. These values did not exceed the relevant permissible limits under MNS 4585:2025. PM_{10} was also reported as compliant with the standard. SO_2 was interpreted as not detected/below the limit of detection in the final report.

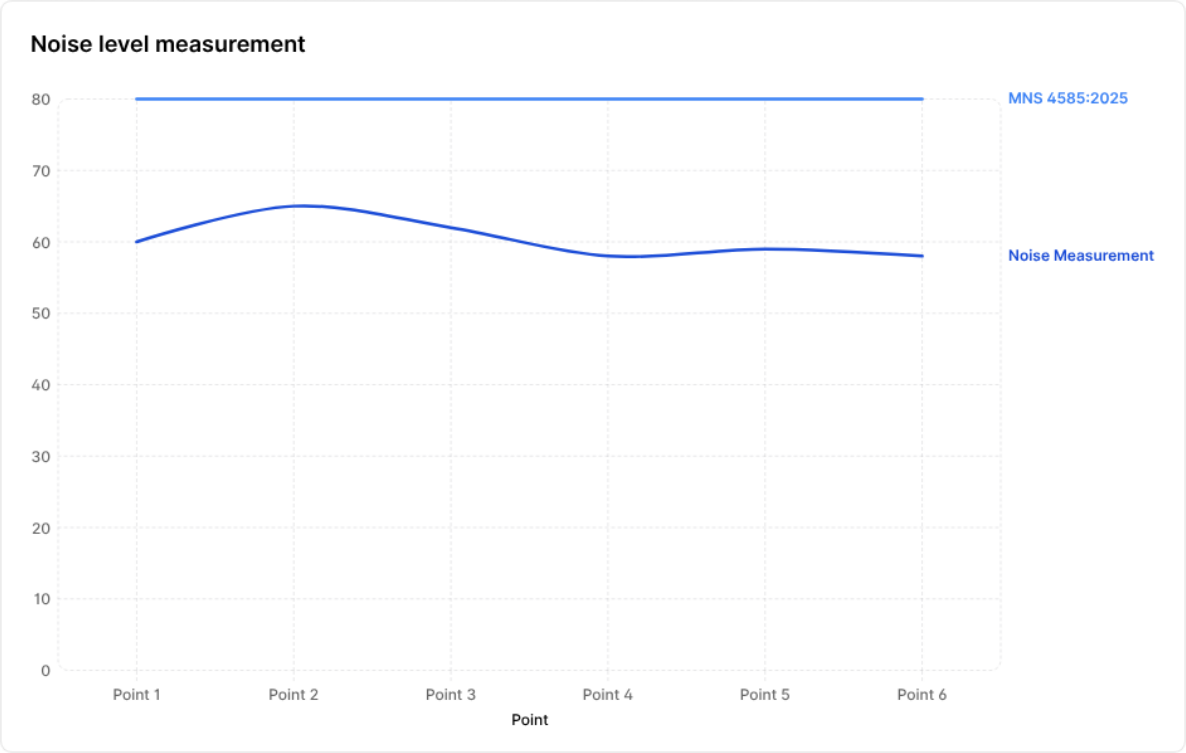
Accordingly, the ambient air quality in the project influence area, prior to commencement of the road rehabilitation works, may be characterized as meeting the applicable baseline air quality requirements. During the construction phase, dust emissions and combustion-related air pollutants associated with earthworks, transport activities, and equipment operation shall be monitored regularly, and appropriate mitigation measures shall be implemented, including water spraying, speed control, covered transport of materials, and moisture control of temporary stockpiles.

2.4. Physical pollution

2.4.1. Noise

The survey team determined the levels of common air pollutants, noise, and ambient radiation at a total of six points along the road alignment in Taragt and Khairkhandulaan soums, and based on these survey results, characterized the state of physical pollution in the project area and its surroundings.

To assess the existing condition of physical pollution within the road Rehabilitation project area, field surveys conducted in 2025 measured ambient radiation levels at six locations using Aeroqual 500 equipment and MS6300 Environment Multimeter instruments, together with noise level measurements.



Graph 2. Noise Measurements along the Road Alignment

Noise measurements taken at six points within the project area were averaged over 15-minute intervals and compared against the Mongolian air quality standard MNS 4585:2025. No values exceeding the standard were observed.

2.4.2. Waste management

Waste management activities at the project site shall be implemented in accordance with Annex of Order No. A/443 dated November 17, 2018, issued by the Minister of Environment and Tourism, titled “General Requirements for the Classification, Collection, Transportation, Recycling, Recovery, Disposal, and Landfilling of Non-Hazardous Waste.”

Waste shall be segregated into three categories:

- Non-hazardous (general) waste
- Recyclable waste
- Hazardous waste

Table 16. Waste categories for segregation

Non-hazardous (General) Waste	Recyclable Waste	Hazardous Waste
– **Food waste** – **Fruit and vegetable peels and residues** – **Bones** – **Used cooking oil**	– Paper (clean or lightly contaminated newspapers, magazines, notebooks, office paper, packaging paper, cardboard, milk and juice tetra packs) – Plastics (various beverage bottles, plastic bags thicker than 0.025 mm, packaging such as ketchup and vegetable oil containers, shampoo and detergent bottles, etc.) – Aluminum, iron, metals, copper, brass, and related products	Hazardous waste refers to waste that is toxic, corrosive, oxidizing, flammable, or explosive, and may harm humans, animals, plants, or the environment. Hazardous waste generated during the Project shall be stored in designated areas and collected, transported, and disposed of by licensed hazardous waste management entities under a formal

– **Other waste excluding hazardous and recyclable waste**	– Glass (all types of glass containers and products) – Cans – Wood and wooden materials – Clothing and textiles – Rubber and similar materials – Grass and wood waste	agreement with a regular disposal schedule, in accordance with applicable laws and regulations.

The Contractor is responsible for planning and implementing further waste management measures, ensuring on-site waste segregation conditions, and providing instructions and training to all employees. Waste generated from the project shall be classified according to its source.

Table 17. Types of waste generated during project phase

№	Type of waste	Source	Management	Regulation
CONSTRUCTION PHASE				
1	Construction waste	Residual construction materials	Contract with the local Governor's Office for disposal at designated sites	Law on Waste and related procedures for collection, sorting, transport, recycling, reuse, disposal, and landfilling
2	Domestic solid waste	Workers' daily activities		General requirements for non-hazardous waste management
3	Domestic liquid waste	Wastewater from workers	Contract with specialized service providers for collection and removal	Standards for wastewater discharge and containment systems
4	Hazardous waste	Oils, fuels, and contaminated materials from machinery	Contract with licensed hazardous waste handlers	Procedures for temporary storage, collection, transport, recycling, disposal, and reportin
OPERATIONAL PHASE				
5	General waste from site, camp, and facilities	After construction phase	Site cleaning and disposal at designated municipal waste points under agreement with local authorities	Managed in accordance with applicable hazardous waste regulations

2.4.3. Waste segregation

During project implementation, solid waste shall be sorted, processed, and transported using waste containers that meet the following requirements:

- Classification of waste bins
- Color coding standards
- Design and type
- Placement location
- Space requirements
- Occupational health and safety

Waste bins must, at minimum, support segregation into:

- Recyclable waste
- Non-recyclable waste
- Organic food waste

Table 18. Color coding for waste segregation

№	Waste type	Color	Color code (CMYK)
1	Plastics and plastic bags		C-84, M-11, Y-98, K-1
2	Metal, aluminum cans, glass		C-0, M-60, Y-100, K-0
3	Paper		C-88, M-52, Y-0, K-0
4	Organic food waste		C-42, M-68, Y-94, K-46
5	Other waste		C-0, M-0, Y-0, K-85
6	Household hazardous waste		C-2, M-0, Y-94, K-0

Portable containers for the collection of general and recyclable waste shall meet the following general requirements:

- Waste bins shall be made of durable, fire-resistant materials and be protected against corrosion.
- The waste collection compartments of the bins shall be clearly marked with standardized labels and color codes indicating the type of recyclable waste.
- Waste bins shall be compatible with waste segregation, collection, loading, and transportation technologies.
- Bins shall be equipped with lids or covers to prevent waste from being dispersed by wind, accumulation of rainwater, and leakage.
- For organic waste, adequate ventilation shall be provided. Ventilation may be mechanical or natural, with a minimum air exchange rate of 0.8 m³/hour.

Waste segregation at source: During project implementation, domestic solid waste generated shall be segregated at the source, its volume minimized, and stored in designated waste containers with appropriate labels and markings. The waste shall then be delivered to the nearest recycling collection points or recycling facilities.

Examples of waste generated include:

- Plastic beverage bottles and single-use plastic items
- Tetra pack containers and packaging for beverages
- Food waste and leftovers from catering services
- Paper, cardboard boxes, paper packaging, and printed materials
- Cleaning product containers
- Heavily contaminated sanitary solid waste
- Worn-out, damaged, or unusable clothing

2.4.4. Fuel and oil spill prevention and response

During construction activities, the use, storage, transportation, and handling of fuel, diesel, oil, lubricants, and bitumen may create risks of accidental spills and leakage, which could contaminate soil, surface water, and groundwater sources. Fuel spills may also create fire hazards and adverse impacts on nearby pastureland, community wells, and ecosystems.

To minimize these risks, the Contractor shall implement the following fuel and oil spill prevention and response measures:

- Fuel, oil, lubricant, and bitumen storage areas shall be established only in designated locations approved by the Engineer.
- Fuel storage and refuelling areas shall be located away from wells, springs, drainage channels, rivers, and seasonal watercourses.
- All fuel and oil storage areas shall include impermeable surfaces and secondary containment systems with minimum capacity of 110% of the largest storage container.
- Fuel tanks, drums, hoses, pumps, and valves shall be regularly inspected for leakage, corrosion, or damage.
- Refuelling and maintenance activities shall only be conducted in designated controlled areas.
- Mobile fuel trucks and machinery shall carry spill kits and absorbent materials at all times.
- Spill kits shall include absorbent pads, sand, booms, shovels, collection bags, and protective equipment.

In the event of a fuel or oil spill:

- The spill source shall be immediately stopped and contained.
- Contaminated soil and materials shall be collected and temporarily stored in sealed containers.
- The affected area shall be cleaned without delay to prevent infiltration into soil or groundwater.
- Significant spills shall be immediately reported to the Supervision Engineer and IPIU.
- Hazardous contaminated waste shall be transported and disposed of through licensed hazardous waste management entities in accordance with applicable regulations.

The Contractor shall prepare and implement a Spill Prevention and Emergency Response Procedure as part of the C-ESMP before commencement of works. All workers involved in fuel handling, machinery operation, and maintenance activities shall receive spill prevention and emergency response training prior to mobilisation and periodically during construction.

2.5. Geological setting and geomorphology

The geological setting of Uvurkhangai province is distinguished by its location along the boundary between two major lithospheric domains of East Siberia, namely the ancient Siberian Platform and the younger Central Asian Mobile Belt**.** Stabilization of the geological structures within the province began as early as the Precambrian. Accordingly, the geological structures shown on the map preserve traces of tectonic events that occurred during the Precambrian and throughout the Phanerozoic**.**

2.5.1. Geomorphology of Uvurkhangai Province

The characteristics of paleogeography and geological structure determine the landform conditions, while vertical tectonic movements that continued through the Late Mesozoic and Cenozoic fundamentally shaped the present-day terrain characterized by alternating mountains and depressions. The surface morphology of Uvurkhangai province is highly diverse, comprising medium-elevation mountains, undulating hills, dissected hills, extensive plains, and valleys. A further distinguishing feature of the province is its relatively high elevation, generally exceeding 1,600 m above sea level. In terms of geomorphological regionalization, the entire territory of the province falls within the Central Asian major geomorphological region. The northwestern part belongs to the Khangai region, the western part to the Great Lakes Depression–Lakes Valley region, the southern part to the Gobi-Altai region, and the eastern part to the Orkhon-Selenge region.

2.5.2. Geological Setting of Taragt and Khairkhandulaan Soums

The geological structure of Taragt and Khairkhandulaan soums is characterized by their distinctive location along the southern margin of the East Siberian lithosphere and the boundary with the Central Asian Mobile Belt. The foundation rocks were stabilized from the Precambrian onward and have undergone multiple tectonic transformations throughout the Phanerozoic. In this area, a wide range of lithologies are distributed, including Cambrian and Paleozoic conglomerates, sandstones, carbonate rocks**,** and strong Mesozoic sedimentary and volcanic rocks**,** such as andesite and basalt**.** This lithological diversity has a direct bearing on road foundation conditions, embankment stability, and the availability of construction materials.

2.5.3. Geomorphology of Taragt and Khairkhandulaan Soums

From a geomorphological perspective, the terrain of the area is highly varied, comprising mountainous and folded uplands, denudation depressions, and river valleys, with relatively

significant elevation differences (990 m to above 1,700 m). Processes of erosion and weathering are active. In ridge zones and on steep slopes, the risk of rockfall and slope failure is elevated, whereas in river valleys, where clayey and sandy soils predominate, the structural stability of road infrastructure may be weakened by moisture and water infiltration.

For implementation of the road rehabilitation project, the following factors require particular consideration:

- stability of the road foundation and embankment;
- hydrological regime and drainage solutions;
- availability of construction materials;
- impacts of climate and weathering; and
- geomorphological influences and associated risks.

The geological and geomorphological characteristics of Taragt and Khairkhandulaan soums indicate the need for detailed engineering assessment of material sources, road alignment stability, drainage system design, and slope/rockfall protection measures. The area presents both opportunities and risks for road construction and rehabilitation and therefore requires careful engineering analysis.

GEOLOGICAL MAP OF THE PROJECT AREA FOR MAJOR REHABILITATION WORKS ON THE 35 KM SECTION OF THE A0302 ROAD ON THE ARVAIKHEER–BAYANKHONGOR ROUTE

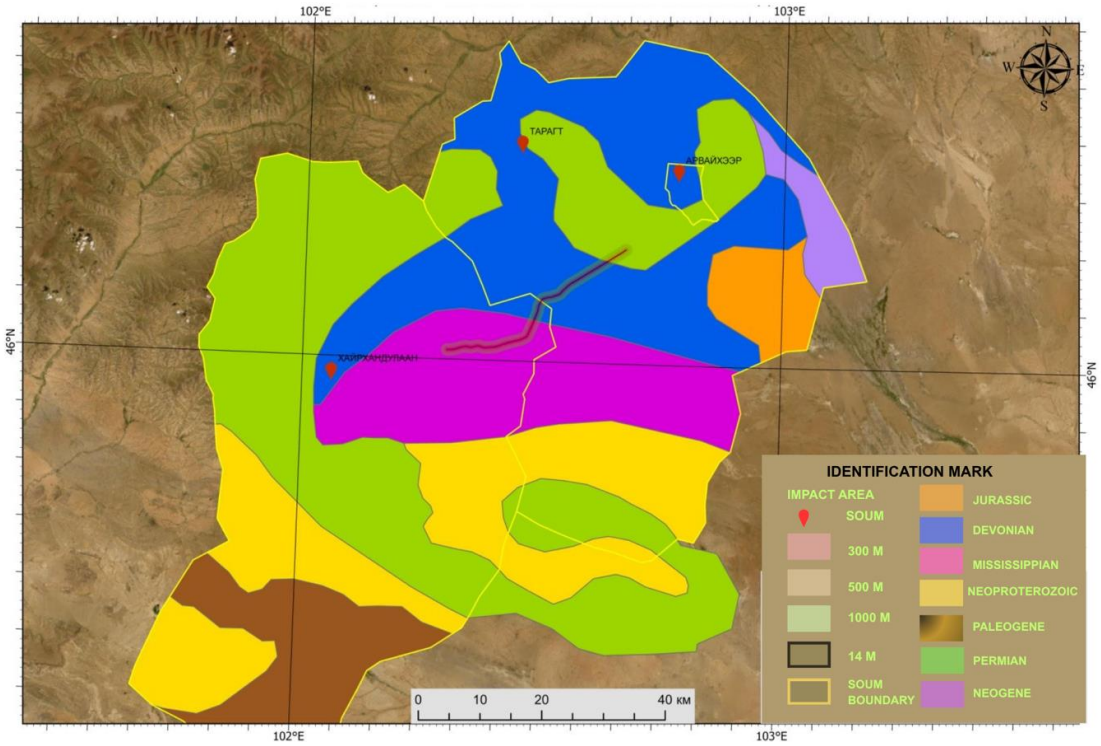


Figure 6. Geological Map of the Project Area

2.6. Surface water and groundwater

2.6.1. Surface Water

Of the total territory of Uvurkhangai province, 19.6% belongs to the Arctic Ocean Basin, while the remaining 80.4% lies within the Central Asian internal drainage basin **(**National Atlas, 1980). Most rivers originate in the Khangai Mountains**.** On the southern slopes of the Khangai Range, the Ongi, Taats, Mukhar, and Murui rivers originate, while on the northern slopes the Orkhon River and its tributaries, including the Baruun, Ulaan, Tsagaan Azarga, and Tsagaan

rivers, originate and flow. The total length of the province's river and stream network is 3,554 km, with a drainage density of 0.05 km/km², which is considered very low.

2.6.2. Surface Water in Taragt and Khairkhandulaan Soums

Taragt soum: Small tributaries of the Orkhon River, small streams, and ephemeral flows occur within the soum. Streamflow is seasonal and typically increases during summer rainfall and spring snowmelt periods. Lakes, springs, and mineral springs are relatively few; small freshwater lakes and dried lake depressions are commonly observed, while most springs and mineral springs are located at the foothills. Surface water-related risks include reduced water availability and unstable flow regimes during dry years, as well as short-duration high-intensity runoff in flood-prone areas.

Khairkhandulaan soum: Small tributary streams associated with the headwaters of the Tuul River occur in the area, and ephemeral channels and gullies are widespread in low-lying terrain. Permanent streams are rare; however, springs and cold mineral springs are numerous, some of which are used by local communities as sources of drinking water. The hydrological regime is sensitive to climate variability, and there is a risk of water sources drying up during drought years. Temporary floodwater ponding is also observed in hayfield and pasture areas.

Table 19. Comparative Assessment of Surface Water

Indicator	Taragt soum	Khairkhandulaan soum
Rivers and streams	Small tributary streams of the Orkhon River	Small headwater streams of the Tuul River
Springs and mineral springs	Relatively few, mainly at foothills	Relatively numerous, including sources of drinking water
Lakes and standing water	Small lakes and dried depressions	Temporary standing water
Risks	Flood loading, aridity	Drying of water sources, temporary ponding

2.6.2. Groundwater

In terms of hydrogeological regionalization (groundwater recharge regime), the project area falls within the central Mongolian district of the temporarily well-recharged northern mountainous province. Within Uvurkhangai province, groundwater is distributed unevenly and in a patchy manner. Groundwater occurrence is greater along river valleys and relatively lower in the southern part of the province. A comparatively large proportion of groundwater resources is stored within aquifers formed in the alluvial deposits of the Ongi River valley. Although the alluvial formations occupy only 0.1% of the area, they account for 6.5% of the province's total groundwater resources. For example, in the Orkhon River (near Kharkhorin soum), 47% of annual flow is derived from rainfall runoff, 16% from snowmelt, and the remaining 37% from baseflow/groundwater contribution. Across Uvurkhangai province, river density decreases from north to south and from west to east, while the contribution of rainfall to stream recharge increases, which is associated with the spatial distribution of precipitation and the declining contribution of snowmelt.

2.6.3. Water use estimation

Dust Suppression Water Consumption

Water consumption for dust suppression under the Project is estimated based on temporary road surfaces. The calculation follows Annex 13 of Order No. A/301 issued on 30 July 2015 by the Minister of Environment, Green Development and Tourism (old name) titled "Standards for Irrigation of Green Areas and Road Surfaces".

The road is 30,000 m long and 8 m wide. A water application rate of 2 liters per 1 m² is assumed, with watering conducted once per week.

Table 20. Water consumption for dust suppression

INDICATOR	Value	Water norm	WATER USE, M³			
			PER APPLICATION	MONTHLY /4 week/	FIRST YEAR /28 week/	TOTAL PROJECT PERIOD /44 week/
Road irrigation	30000 m x8 m	2 liter/m²	480	1920	13440	21120

Domestic water consumption

During project implementation, a maximum of 197 workers will be employed, of which approximately 130-140 workers will be accommodated in the construction camp on a permanent or rotational basis. More than 30% of the workforce will be local employees; therefore, domestic water demand is calculated based on camp-based workers.

Water consumption is estimated in accordance with the joint Order No. A-333/A-245 (2017) of the Minister of Health and the Minister of Environment and Tourism titled “Recommended Daily Domestic Water Consumption Standards.”

Table 21. Domestic water consumption estimate

WATER USE TYPE	NORM (L/day)	DAILY DOMESTIC WATER REQUIREMENT (L/PERSON/DAY)	TOTAL WORKERS (PERSONS)	WATER USE, M³			
				DAY	MONTH /30 days/	FIRST YEAR /7 months/	TOTAL PROJECT PERIOD /11 months/
Food preparation and dishwashing	150	30	140	4.2	126	882	1386
Personal hygiene (hand/face/teeth washing)		5		0.7	21	147	1617
Bathing		50		7	210	1470	2310
Laundry and cleaning		65		9.1	273	1911	3003
TOTAL	**150**			**21.0**	**630**	**4410**	**8316**

Dust suppression activities represent the dominant share of water use due to the large road surface area and regular watering requirements, while domestic water demand is comparatively lower and linked to workforce size and camp activities such as food preparation, hygiene, and cleaning.

Overall, the Project will require a continuous and significant water supply during construction, primarily driven by dust control operations. Given this demand, it is essential to ensure that all abstraction is properly permitted, groundwater baseline conditions are established prior to commencement, and monitoring is implemented to avoid adverse impacts on local groundwater resources and community water users.

2.7. Soil cover

Within Uvurkhangai province, the dominant soil-forming parent materials are eluvial and deluvial deposits (D. Dorjgotov, 1997). Based on the areal extent of the main soil types, the largest category is soils of plains and depressions, covering 28,099 km² or 44.7%, mountain soils distributed in medium and low mountains cover 22,825 km² or 36.4%, soils of low mountains and hills cover 7,536 km² or 12%, hydromorphic soils cover 1,361 km² or 2.2%, alluvial/floodplain soils cover 1,297 km² or 2%,saline soils cover 1,036 km² or 1.6%, and the

remaining 711 km² consist of other soils and non-soil areas. Although soil types vary according to the characteristics of the natural zones, brown soils are predominant.

2.7.1. Field Survey

Soil Survey Methodology

The following equipment and tools were used in the soil survey: shovel, measuring tape, sample bags, 10% hydrochloric acid, Soil Munsell Chart, sampling spatula, GPS device, and camera. Fieldwork was conducted on 31 August 2025, and a total of three topsoil samples were collected from a depth of 0–15 cm at three locations. Sampling was carried out in accordance with MNS 3298:1990. Soil samples collected during the field measurements were analyzed for general chemical properties at the Soil Agrochemical Laboratory of Green Lab LLC.

Table 22. Soil Sampling Locations

No.	Pit No.	General Location	Soil Condition	Coordinates (Decimal Degree) X	Coordinates (Decimal Degree) Y
1	Pit-1	Beginning of the alignment	Normal	102° 43’ 45	46°11’ 50
2	Pit-2	Around Km 15 of the alignment	Normal	102° 37’ 59	46°8’ 59
3	Pit-3	Around Km 35.82 of the alignment	Normal	102°27’ 40	46°2’ 2

2.7.2. Survey Results

This survey was carried out to identify the current condition and characteristics of soils within a 2-km-wide corridor along the paved road alignment in the project area.

The average elevation of the area ranges from 1,721.3 m to 2,193.3 m above sea level, and the soil cover has undergone a certain degree of change due to the influence of local roads and transport routes. Within the area along the road alignment, the following soil types are distributed: gravelly shallow and gravelly brown-grey soil (39.5%), stony shallow and stony brown-grey soil (32%), ordinary brown-grey soil (16%), gravelly sandy, gravelly and clayey soil (11%), and sandy brown-grey soil (0.9%). Stony soils occur on steeper slopes, gravelly soils are found on gently sloping pediments, toeslopes, and relatively level areas, ordinary brown-grey soils occur in relatively flat valleys, and sandy soils occur in vegetated depressions. Brown-grey soils are generally of low fertility, are easily disturbed by mechanical impacts, have poor natural regeneration capacity, and exhibit fragile structural stability.

Morphological Characteristics of the Surface Horizon and Soil Profile of Dominant Soils

Dark brown soil: This is the most widespread soil type along the road alignment. The ground surface is covered by 40–50% gravel and rock fragments, with plant communities composed of golden caragana, feather grass, and wormwood associations. Vegetation cover is 10–20%, with no salinity or sand accumulation, very limited soil degradation, and no visible solid waste contamination. The soil horizons are as follows: Q (1–2 cm), Bq (2–13 cm), and Bca/Bcca (13–46 cm).

Mountain ordinary dark brown soil: In the study area, the A horizon of this soil type contains 8.59% humus, which is considered very rich. The reaction is neutral with a pH of 6.93, electrical conductivity is low, and the soil is non-saline. In terms of fertility indicators, the total exchangeable bases amount to 63.5 mg/100 g. Phosphorus content is very low, while

potassium content is high, with potassium ions predominating. No carbonate content was detected.

Ordinary dark brown soil: This soil is widespread along the road alignment. The soil surface has 10–20% stone cover**,** with grass-forb communities containing caragana and shrubs. Vegetation cover is 10–20%, with no salinity or sand accumulation, and only low levels of degradation and contamination.

The soil horizons are as follows:

- Bca (3–15 cm): orange-tinted brownish grey, slightly dry, sandy loam texture, 0–5% small stones, carbonate-bearing;
- BCca (15–30 cm): orange-tinted brownish grey, slightly moist, sandy loam texture, 5–10% small stones, carbonate-bearing;
- Cca (30–50 cm): brownish yellow, dry, sandy loam texture, carbonate-bearing, 5–10% small stones.

Root distribution is limited, newly formed features are minor, and transitions between horizons are clearly observable.

Table 23. Main Soil Chemical Characteristics

Pit No.	Soil Type	Depth, cm	pH	Salinity, %	EC, dS/m	Humus, %	CaCO2, %	Nutrient Elements, mg/100 g P2O5	Nutrient Elements, mg/100 g K2O
Arvaikheer grassland-01	Mountain ordinary dark brown steppe soil	0–10	6.93	0.13	0.271	8.59	0.00	6.5	57
Taragt-02	Mountain dark brown soil	0–10	8.77	0.03	0.077	3.74	0.00	3.8	32
Khairkhan-dulaan-03	Ordinary dark brown soil	0–5	7.51	0.23	0.479	2.95	8.01	3.5	37
		5–12	7.72	1.50	2.930	0.78	8.01	2.5	41
		12–34	8.20	0.93	1.888	1.94	4.61	2.7	21

The study found that soils in the vicinity of the project area are represented by steppe-zone soil types, including dark brown soil**,** ordinary dark brown soil**,** and mountain dark brown soil. Soil pH ranges from 6.93 to 8.77, indicating predominantly neutral to slightly alkaline conditions. In particular, Taragt-02 (pH 8.77) and Khairkhandulaan-03 at 12–34 cm depth (pH 8.20) exhibit more pronounced alkalinity. Salt content ranges from 0.03% to 1.50% and tends to increase with depth. The salt content of 1.50% at 5–12 cm depth in Khairkhandulaan-03 indicates moderate salinity**.** Electrical conductivity ranges between 0.077 and 2.930 dS/m**,** suggesting weak salinity near the surface and moderate salinity in deeper layers. Humus content ranges from 0.78% to 8.59%**,** with the highest value observed in the Arvaikheer sample (8.59%)**,** indicating good vegetation cover and nutrient-rich soil at that location. In contrast, humus content decreases sharply in the deeper layers of Khairkhandulaan-03**.**

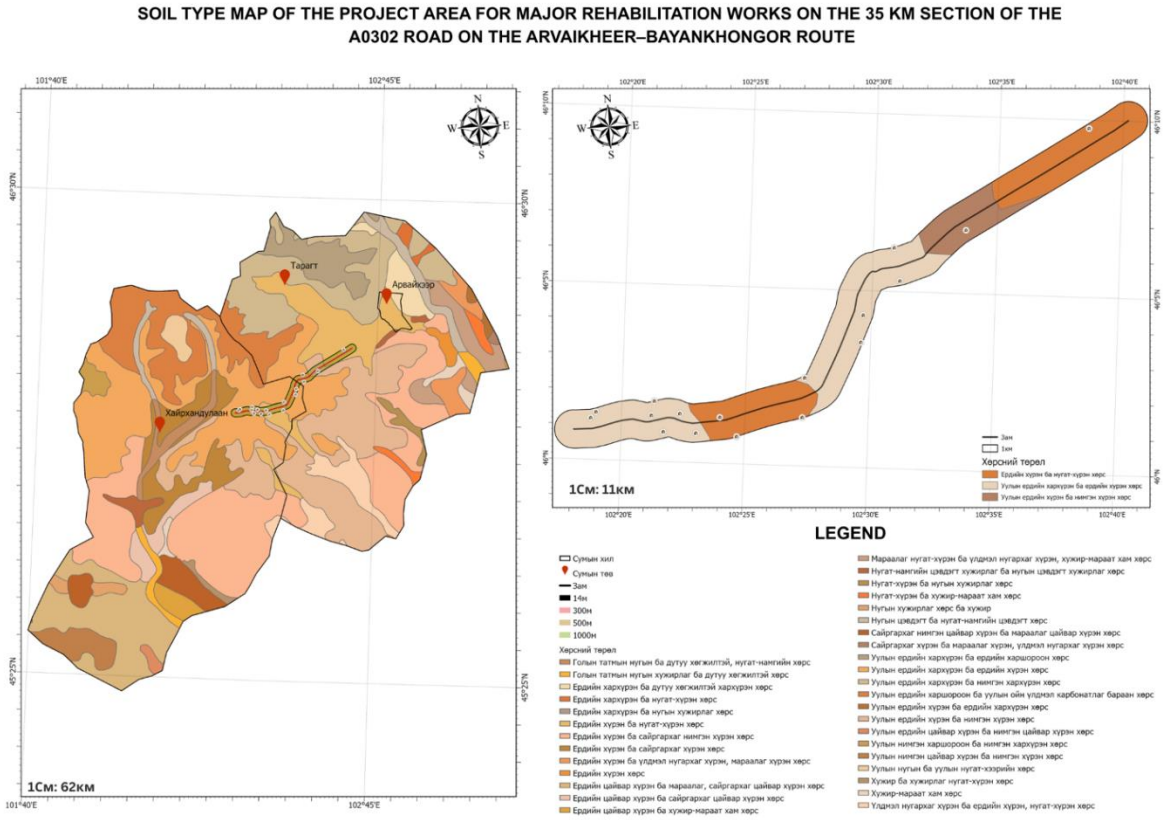


Figure 7. Soil Type Map of the Project Area

2.8. Vegetation cover

The section of the Arvaikheer–Bayankhongor corridor covered by this Project lies, in terms of vegetation classification, within the Khangai mountain steppe subregion of the vegetation-geographical zoning system, where the following plant communities have been recorded.

Based on the consolidated vegetation records, areas adjacent to the road are characterized by mountain steppe on slopes and upland plains with chernozem and dark brown soils, dominated by mixed forb–fescue and mixed forb–small bunchgrass–fescue associations, including Festuca lenensis, Poa attenuata, and Koeleria macrantha. In this Khangai steppe, species such as Thalictrum foetidum, Chamaerhodos altaica, Androsace incana, and Potentilla sericea also occur.

To the east of the road alignment, in somewhat lower terrain, mountain dark brown and chernozem soils of generally light loamy texture support mixed forb–Koeleria and mixed forb–fescue–Koeleria mountain steppe communities, including Koeleria cristata, Festuca lenensis, Poa attenuata, Oxytropis filiformis, Aster alpinus, Arenaria capillaris, and Potentilla sericea. On carbonate-rich soils, Agropyron cristatum is abundant.

Along the road alignment, in gleyic soils, sedge meadows with willow thickets occur. In addition, within river basins of the forest belt and meadow bottoms of floodplain valleys, marsh and marshy sulfurous permafrost-affected soils support scattered shrub thickets of Dasiphora fruticosa, Salix rhamnifolia, S. pseudopentandra, and S. caesia, together with mixed forb communities including Ligularia sibirica, Primula tarinosia, Parnassia palustris, and Pedicularis longiflora, as well as sedge and grass-sedge meadows composed of Carex duriuscula, C. norvegica, C. reptabunda, Eriophorum polystachyon, Juncus triglumis, and Kobresia bellardii.

Within the surveyed area, fescue steppe (Festuca lenensis) occurs in the lowlands, valley bottoms, and low- to mid-elevation mountains at the western extremity of the Khangai Range.

Based on the field survey conducted along the road alignment, a total of 160 plant species belonging to 107 genera and 40 families were recorded. Of these, 95.2% are widespread species. Three rare species were recorded:

- Lilium pumilum DC. (dwarf lily / red lily);
- Stellaria dichotoma L.; and
- Valeriana officinalis L.

No very rare or rare nationally protected species were recorded. At the regional scale, vegetation cover is generally 60–70%, indicating relatively dense vegetation cover. Vegetation abundance was assessed using the Drude scale, with species in the community recorded as generally abundant (cop1), sparse (sp), or individually scarce/countable (sol).

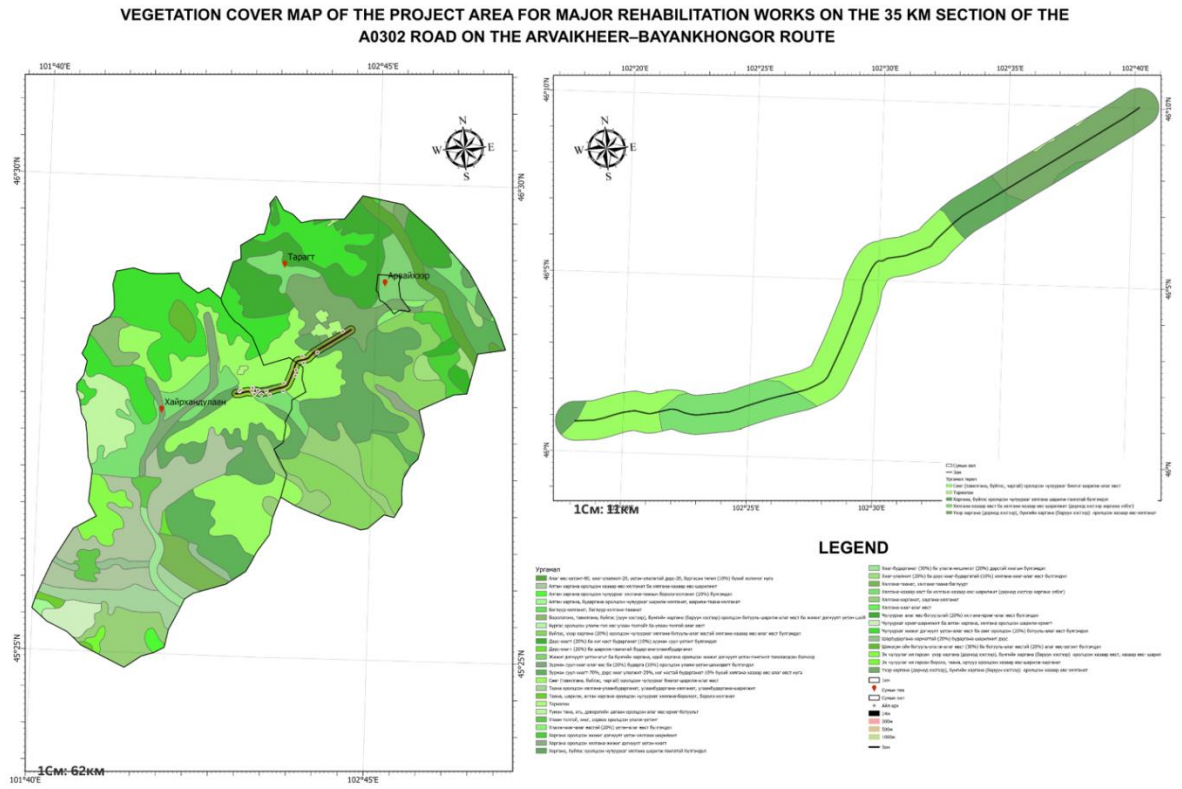


Figure 8. Vegetation Cover Map of the Project Area

2.9. Fauna

Uvurkhangai province spans mountain forest-steppe, steppe, and desert zones, and falls within the Khangai forest-steppe**,** Lakes Valley desert steppe**,** Middle Khalkha dry steppe**,** and Gobi-Altai desert steppe subregions. Owing to this ecological setting, the province is rich in both flora and fauna.A total of 73 mammal species from 7 orders and 16 families, more than 370 bird species, more than 70 fish species, and more than 20 protected animal species have been recorded within the province. Among mammals, the dominant groups include insectivores, bats, lagomorphs, rodents, carnivores, and both even-toed and odd-toed ungulates.

Examples include the following mammals listed in the Red Book**:** Altai argali (*Ovis ammon*), musk deer (*Moschus moschiferus*), wild boar (*Sus scrofa*), Siberian roe deer (*Capreolus pygargus*), red deer (*Cervus elaphus*), snow leopard (*Uncia uncia*), Pallas's cat (*Otocolobus*

manul), Siberian ibex (*Capra sibirica*), and goitered gazelle (*Gazella subgutturosa*). Bird species include greater spotted eagle (*Aquila clanga*), ferruginous duck (*Aythya nyroca*), white-naped crane (*Grus vipio*), bearded vulture (*Gypaetus barbatus*), Asian dowitcher (*Limnodromus semipalmatus*), Mongolian ground jay (*Podoces hendersoni*), great bustard (*Otis tarda*), Altai snowcock (*Tetraogallus altaicus*), and white-throated bushchat (*Saxicola insignis*). One reptile species, Coluber spinalis, and insects such as Parnassius stubbendorfi, Parnassius phoebus, and Papilio machaon have also been recorded.

Distribution and Abundance of Fauna

The Project area lies within an ecotone between mountain steppe and open steppe, characterized by mixed forb fescue and small bunchgrass vegetation. This habitat supports small mammals, insectivores, steppe birds, and mountain-steppe ungulates. Wildlife movement is generally diffuse; however, certain species such as red deer, roe deer, wolves, and large birds may undertake seasonal or long-distance movements across the broader landscape.

Although no confirmed Mongolian gazelle (*Gazella subgutturosa*) migration corridor directly overlaps the road alignment, indirect movement through the wider landscape remains possible and shall be considered in ecological risk assessment.

Distribution of Wildlife and Special Protected Areas

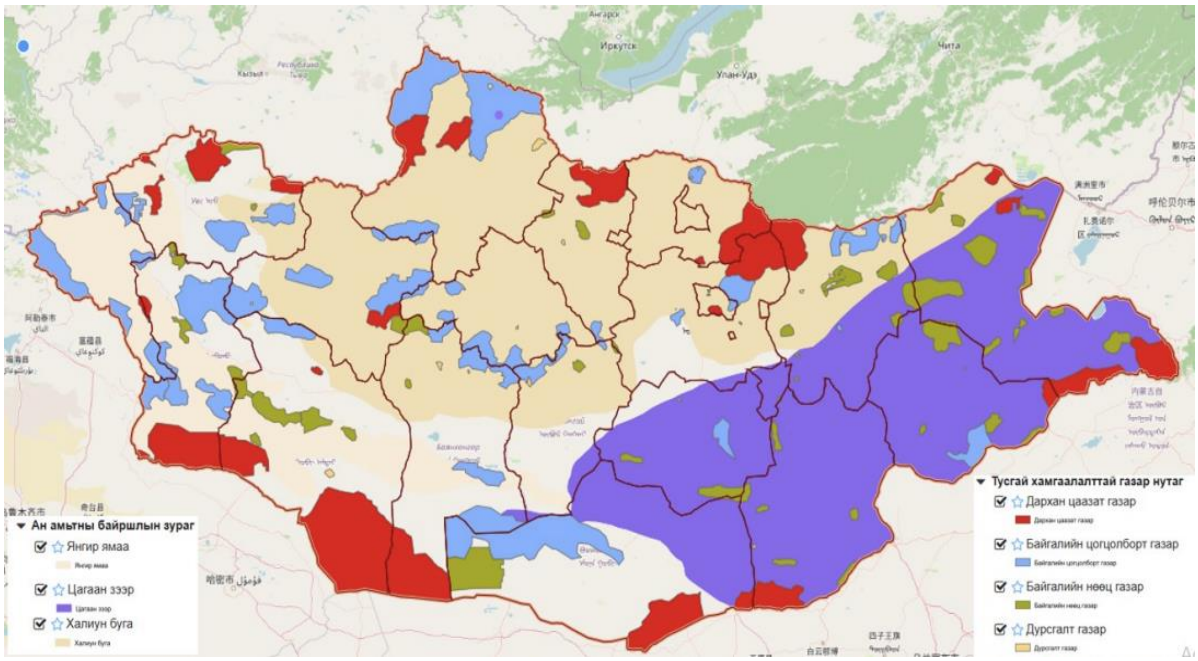


Table 24. Wild Animal Species Potentially Occurring within the Project Area of Influence

Group	Mongolian Name	Latin Name	Status*	Main Habitat	Main Road-Related Risk
Mammals	Wolf	*Canis lupus*	LC	Hills, steppe	Collision during nocturnal movement, conflict
	Red fox	*Vulpes vulpes*	LC	Steppe, areas near settlements	Collision where crossing opportunities are limited
	Long-tailed ground squirrel	*Urocitellus undulatus*	LC	Reeded steppe, plains	Population fragmentation, movement along embankments

	Marmot	*Marmota sibirica*	EN (MN)	Foothills, rocky steppe	Illegal hunting, road-related disturbance
	Tolai hare	*Lepus tolai*	LC	Relatively undisturbed steppe	Collision during nocturnal movement
	Steppe polecat	*Mustela eversmanii*	NT	Plains with abundant rodents	Road collision
	Pallas's cat	*Otocolobus manul*	NT	Rocky steppe	Collision along the road corridor
	Corsac fox	*Vulpes corsac*	LC	Dry steppe	Nocturnal collision
	Red deer	*Cervus elaphus*	LC (MN)	Forest-steppe ecotone	Road crossing, attraction to lights
	Roe deer	*Capreolus pygargus*	LC	Riverbanks, shrubby ravines	Barrier effect of the road, entanglement in fences/wire
Birds	Great bustard	*Otis tarda dybowskii*	EN	Open steppe	Collision, disturbance of nesting grounds
	Cinereous vulture	*Aegypius monachus*	NT	Hills, cliffs	Attraction to utility poles and roadkill
	Steppe eagle	*Aquila nipalensis*	EN	Hills, cliffs	Utility poles, roadkill
	Demoiselle crane	*Anthropoides virgo*	LC	Wet steppe	Collision risk when accompanied by chicks
	Saker falcon	*Falco cherrug*	EN	Steppe plains	Utility poles, illegal capture

***** LC – Least Concern; NT – Near Threatened; EN – Endangered (IUCN / Mongolian Red Book classifications used as reference).

The survey found no observed wildlife crossings within the seven sections where road construction activities will be undertaken. If wildlife migration or movement is observed along any section of the road alignment, the Contractor shall prepare and implement a Biodiversity Management Plan as part of the Contractor's ESMP.

The Project corridor intersects a landscape that functions as a broader ecological movement zone rather than a fully confined habitat system. Therefore, potential impacts include not only direct mortality risks but also habitat fragmentation and disruption of ecological connectivity, particularly for wide-ranging species such as wolves, red deer, roe deer, and large raptors.

In accordance with World Bank ESS6 requirements, the Project shall ensure that:

- wildlife movement corridors are identified prior to construction;
- road-related barriers to ecological connectivity are minimized;
- habitat fragmentation risks are assessed across all road sections, quarries, borrow pits, and temporary infrastructure.

2.10. Protected areas

The designation and management of land under protected area status is one of the classic forms of environmental protection globally, aimed at halting and limiting environmental degradation and maintaining the natural interrelationships of ecosystems. It is also one of the fundamental means by which humanity preserves unique natural, historical, cultural, and scientific heritage for future generations, ensures ecological balance, and promotes development in harmony with the environment.

Within Uvurkhangai province, there are a total of six State Special Protected Areas, including Nature Conservation Parks, Nature Reserves, and Natural Monuments. These include:

- Orkhon Valley National Park;
- Khangai Nuruu National Park;
- Khugnu-Tarna National Park;
- Batkhaan Mountain Nature Reserve;
- Dulaan Khairkhan Mountain Nature Reserve; and
- Khuisiin Naiman Nuur Natural Monument.

There are no State Special Protected Areas within the territories of Taragt and Khairkhandulaan soums, where the Project will be implemented, and the road alignment does not overlap with any State Special Protected Area.

At the local level within the Project region, there are two locally protected areas in Khairkhandulaan soum and one in Taragt soum. The Project site is located approximately 35.82 km from the Khan Khugshin Uul locally protected area and 20 km from the Khuisiin Tal locally protected area. The road alignment likewise does not overlap with any locally protected area.

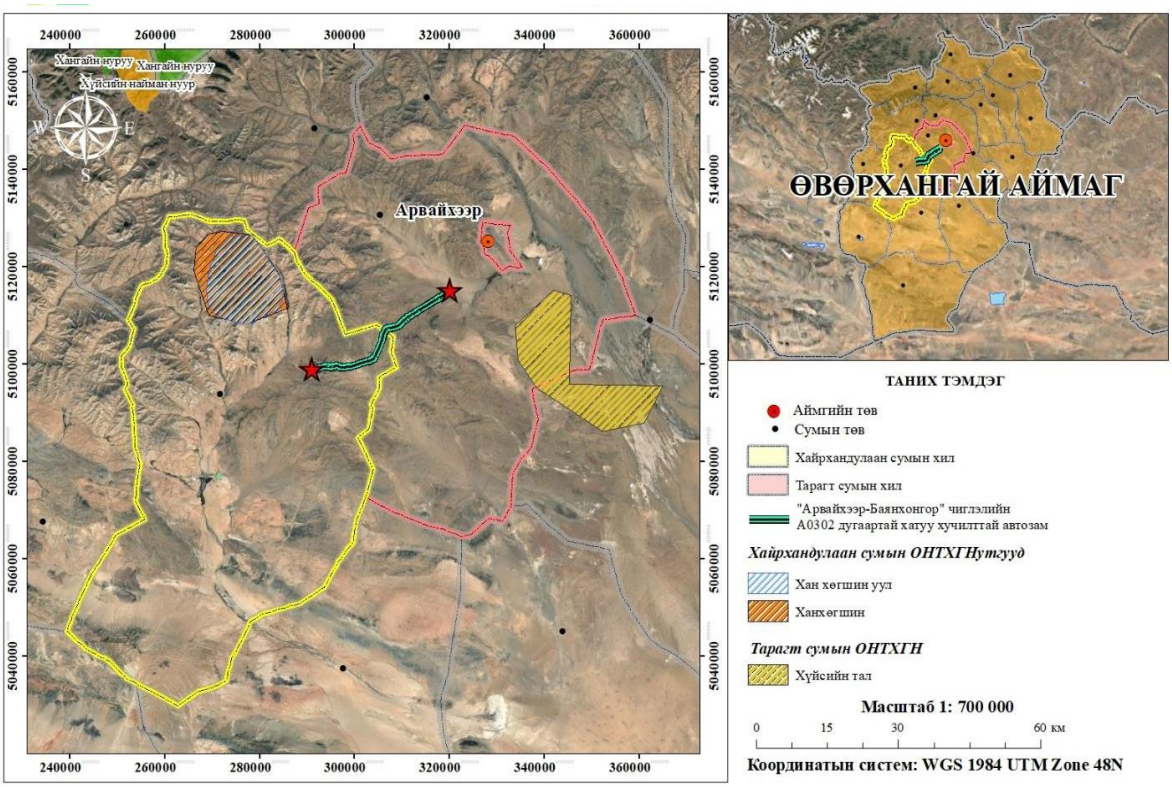


Figure 9. Map of Locally Protected Areas

CHAPTER 3. SOCIO-ECONOMIC BASELINE CONDITIONS OF THE PROJECT AREA

3.1. Chapter objective, scope, and methodology

The purpose of this chapter is to define the socio-economic baseline conditions of the subproject area and to establish the baseline information necessary to assess potential social risks and impacts that may arise during the construction and operation phases of the Project. The assessment covers demographic characteristics, household structure, livelihood patterns, livestock husbandry, land use, roadside services, social infrastructure, access to public services, the conditions of vulnerable and disadvantaged groups, community safety, and traffic characteristics. This information provides the baseline for identifying environmental and social risks and impacts, planning mitigation measures, and conducting monitoring throughout Project implementation.

The 35.82 km road rehabilitation works along the Arvaikheer–Bayankhongor road corridor will be implemented within the territory of Arvaintal Bag of Taragt Soum and Emeeltt Bag of Khairkhandulaan Soum, both in Uvurkhangai Province. Accordingly, these Bags were defined as the Project-affected administrative units. The Project's direct area of influence was defined as the 500 m corridor on each side of the road centerline, equivalent to a total width of 1 km, as well as the area within a 500 m radius of temporary use sites such as quarries, camps, temporary access roads, material storage areas, and equipment maintenance yards. Within this scope, the local population, herder households, roadside service providers, road users, local government institutions, public service agencies, and vulnerable or disadvantaged persons were considered key stakeholders and potentially affected parties.

Baseline data were compiled from both secondary and primary sources. Secondary sources included official data from the National Statistics Office, province and soum Governor's Offices, and institutions responsible for health, education, employment, and land administration, as well as relevant online sources and previously conducted studies and analytical reports. Primary data were collected through meetings and consultations with local authorities and Bag-level representatives, as well as through a sample household socio-economic survey. The household survey was conducted in two phases as part of the preparation of the Environmental and Social Management Plan, covering 8 of the 17 households present within the area of influence at the time of the survey. However, because the survey period did not fully coincide with the peak tourism season, the main road construction season, herders' seasonal migration, or peak traffic conditions, additional information disclosure, targeted consultation meetings, and renewed engagement with vulnerable households will be required before commencement of construction. This approach is consistent with the ESF/ESS1/ESS10 principles of risk-based assessment, meaningful consultation throughout the Project cycle, accessible information disclosure, and the establishment of an effective grievance mechanism.

3.2. Governance and institutional context

Mongolia's administrative and territorial organization is based on a hierarchical system of province, soum, and Bag, implemented through a combination of local self-governance and state administration. In rural areas, the Bag is the lowest administrative unit and represents the

institutional level closest to Project-affected communities for the purposes of information disclosure, stakeholder organization, grievance collection, identification of vulnerable households, and response to community safety issues.

At the province and soum levels, Citizens' Representative Khurals serve as local self-governing bodies, while at the Bag level, the Bag Citizens' General Meeting functions as the representative forum. In relation to the Project, these institutions are directly or indirectly involved in local development policy, budgeting, public property management, oversight, trade and services, water supply, waste management, local infrastructure, citizen participation, and the organization of public feedback. Clear delineation of roles and coordinated engagement with province, soum, and Bag-level institutions are therefore required for effective management of the Project's social risks.

Table 25. Allocation of Project-Relevant Functions Among Local Administrative Institutions

Administrative level	Core mandate	Main Project-related functions	Areas for coordination with the Project team
Province	Province development policy, budget, property, oversight, and coordination of sector agencies	Inter-agency coordination, overall supervision, and integrated oversight at the province level	Project coordination, consolidated risk oversight, and cross-sector coordination
Soum	Soum development policy, local property, service organization, and public utilities	Water, waste, local roads, traffic management, and social services	Camp, quarry, and temporary site management; traffic arrangements; information disclosure; grievance handling
Bag	Direct engagement with citizens, collection of feedback, and facilitation of participation	Provision of information to households, herders, and vulnerable groups within the area of influence	Targeted consultations, household registration, and access to information for vulnerable groups

Under the Law on Administrative and Territorial Units and Their Governance, the number of Citizens' Representative Khural members at province and soum levels is determined based on registered population. In the Project-affected soums, the number of Khural representatives is relevant for understanding the coverage of local representative institutions, information flows, and the institutional capacity for local decision-making.

Table 26. Number of Citizens' Representative Khural Members, by Soum

Soum	Population of affected Bag	Number of Khural representatives
Taragt	394	21
Khairkhandulaan	618	21

Project relevance: Appropriate use of the local administrative structure will provide the local foundation for information disclosure, participation of vulnerable groups, and implementation of the grievance mechanism. ESS10 requires early identification of stakeholders, accessible information disclosure, and sustained constructive engagement throughout the Project cycle.

3.2. Demography

The population of Arvaintal and Emeelt Bags, which fall within the Project area of influence, remained broadly stable during 2020–2024, reaching a total of 1,012 persons at year-end 2024. For a road rehabilitation project, this indicates a low-density, remote, and dispersed settlement pattern in a predominantly livestock-based rural area.

Of the total population, 54 percent, or 545 persons, are male and 46 percent, or 467 persons, are female. The sex ratio shows an increasing trend over 2020–2024, indicating a growing share of the male population. At the Bag level, the population of Emeelt Bag in Khairkhandulaan Soum increased while the number of households declined, whereas both population and household numbers declined in Arvaintal Bag of Taragt Soum. This may be associated with internal household restructuring, migration, and seasonal settlement patterns, and suggests that the number and distribution of actually affected households should be assessed not only by registered population but also with reference to seasonal occupancy patterns.

The age structure indicates a declining share of the population aged 0–14 and a growing share of the working-age population aged 15–64. As a result, the total demographic dependency ratio declined from 51 percent in 2020 to 46 percent in 2024. While the decline in the child population contributed to lower dependency, access to services and safe mobility for children, older persons, and persons with disabilities in remote households remains a key consideration in the Project's social risk assessment. ESS4 requires particular attention to community health and safety risks for Project-affected people, especially vulnerable groups.

Table 27. Population and Key Demographic Indicators of Project Bags

Indicator	2020	2021	2022	2023	2024
Population of Arvaintal Bag	446	432	408	405	394
Population of Emeelt Bag	580	580	614	609	618
Total population	1,026	1,012	1,022	1,014	1,012
Population growth	-	-1.4%	1.0%	-0.8%	-0.2%
Male	539	535.82	541	543	545
Female	487	477	481	471	467
Sex ratio	110.7%	112.2%	112.5%	115.3%	116.7%
Number of households in Arvaintal Bag	138	137	127	130	132
Number of households in Emeelt Bag	182	185	170	171	172
Population aged 0–14	28.4%	27.9%	27.8%	26.4%	25.6%
Population aged 15–64	66.2%	66.5%	67.2%	67.9%	68.6%
Population aged 65+	5.5%	5.6%	5.0%	5.7%	5.8%
Child dependency ratio	43.0%	42.0%	41.0%	39.0%	37.0%
Old-age dependency ratio	8.0%	8.0%	7.0%	8.0%	9.0%
Total dependency ratio	51.0%	50.0%	49.0%	47.0%	46.0%

Source: NSO, 2024.

Project relevance: The high proportion of working-age population indicates potential for use of local labor during the construction phase. However, the safety and service access needs of children, older persons, and vulnerable groups require separate assessment to be conducted by the Contractor at CESMP stage.

Table 28. Population Distribution by Age Group in Arvaintal and Emeeltt Bags, 2022–2024

Age Group	Arvaintal 2022	Arvaintal 2023	Arvaintal 2024	Trend	Emeeltt 2022	Emeeltt 2023	Emeeltt 2024	Trend
0–4	12.5%	10.4%	8.9%	Decreasing	9.1%	8.4%	8.4%	Decreasing / stable
5–9	8.6%	7.7%	7.1%	Decreasing	10.9%	10.7%	9.9%	Decreasing
10–14	5.9%	6.9%	6.3%	Fluctuating	8.3%	8.4%	9.4%	Increasing
15–19	8.6%	7.7%	8.4%	Fluctuating	8.8%	8.2%	6.8%	Decreasing
20–24	11.0%	10.6%	11.4%	Slight increase	7.7%	8.2%	9.4%	Increasing
25–29	9.1%	9.1%	9.9%	Increasing	7.5%	7.6%	7.8%	Slight increase
30–34	4.7%	5.4%	4.6%	Fluctuating	5.9%	5.9%	4.7%	Stable / decreasing
35.82 –39	4.4%	4.7%	4.6%	Slight increase / stable	6.5%	6.9%	6.8%	Slight increase / stable
40–44	7.6%	7.2%	7.1%	Decreasing	8.5%	7.2%	6.5%	Decreasing
45–49	9.1%	9.4%	10.2%	Increasing	7.5%	9.0%	9.5%	Increasing
50–54	4.9%	6.4%	6.3%	Increasing	7.8%	7.6%	8.6%	Increasing
55–59	4.7%	4.7%	4.3%	Slight decrease	3.7%	4.3%	3.9%	Fluctuating
60–64	3.4%	4.2%	5.3%	Increasing	3.3%	2.0%	2.4%	Decreasing / slight recovery
65–69	1.7%	1.7%	1.8%	Stable / slight increase	1.8%	2.8%	2.8%	Increasing / stable
70+	3.9%	4.0%	3.8%	Stable	2.8%	3.0%	3.2%	Increasing

The demographic dependency ratio in the Project Bags declined by 5 percentage points over the past five years and stood at 46 percent, primarily due to a reduction in the child population.

Note: The 20–24 age group in Arvaintal Bag and the 5–9 age group in Emeelt Bag account for relatively high shares of the population.

Project relevance: In areas where youth and children constitute a significant population group, construction-phase traffic safety, access to information, and safe mobility for school-age children require special consideration.

3.3. Ethnic composition

3.3.1. Overview

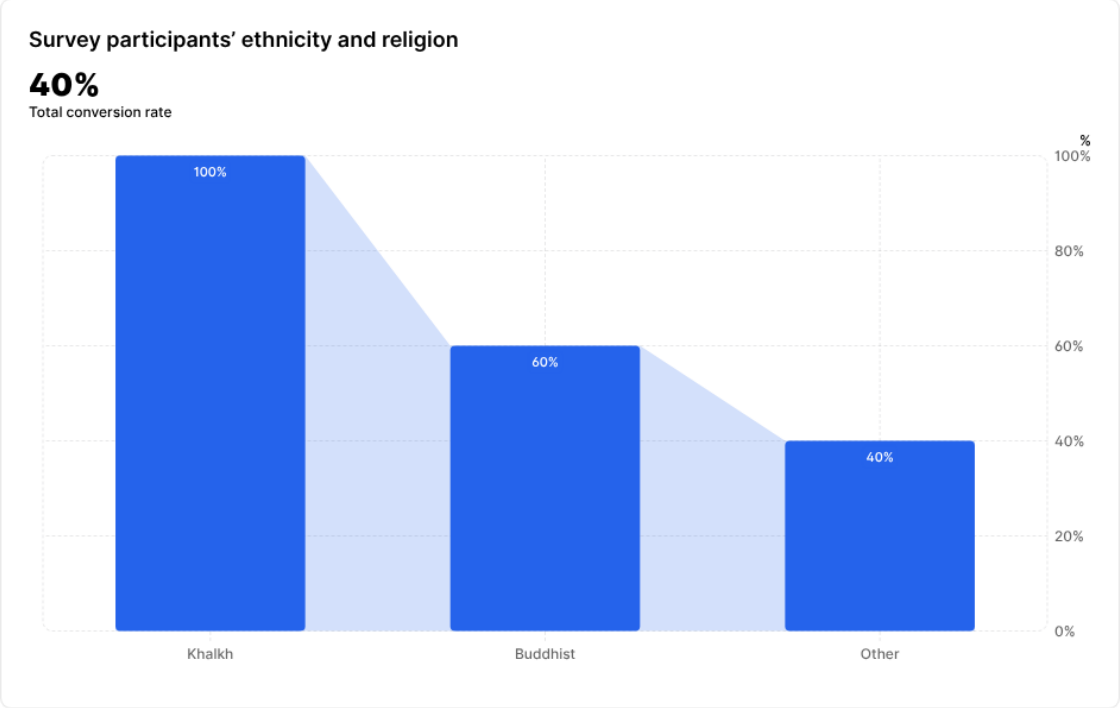
The ethnic composition of the population of Uvurkhangai Province is overwhelmingly Khalkh Mongol. The shares of Durvud, Bayad, and other ethnic groups are very small. The Project area of influence may therefore be considered relatively homogeneous in ethnic composition. While this suggests a relatively low risk of language barriers or direct participation constraints based on ethnicity, it does not eliminate the need to consider vulnerabilities linked to social characteristics or differences in access to information.

Table 29. Share of Population by Ethnic Group, Uvurkhangai Province

Ethnic group	Uvurkhangai Province
Khalkh	99.6
Durvud	0.1
Bayad	0.1
Other	0.2
Total	100

3.3.2. Ethnicity and Religion of Sampled Households

All respondents in the household socio-economic sample survey identified themselves as Khalkh. In terms of religion, some respondents identified as Buddhist, others as belonging to other religions, and some did not respond. However, the percentages used in the source text exceed 100 percent in total; therefore, the raw questionnaire data should be cross-checked and validated before finalizing the report. Leaving this inconsistency uncorrected would create a quality control risk in the final document.



Graph 3. Ethnicity and religion of survey respondents

Project relevance: There is limited need for multilingual communication; however, vulnerability linked to religion or social characteristics cannot be excluded. In accordance with ESS10, information disclosure must be understandable, accessible, and appropriate to local circumstances.

3.4. Household composition, marriage, and divorce

3.4.1. General Pattern of Marriage and Divorce

Marriage registrations in Taragt and Khairkhandulaan soums were recorded consistently during 2022–2024, although annual fluctuations are evident. In Taragt Soum, a total of 22 marriages were registered over the period, declining in 2023 and increasing again in 2024. Five divorces

were also registered. In Khairkhandulaan Soum, 30 marriages were registered over the same period, increasing in 2023 and declining in 2024, while three divorces were recorded.

Table 30. Number of Marriages and Divorces

Soum	Indicator	2022	2023	2024
Taragt	Marriages	8	5	9
	Divorces	2	2	1
Khairkhandulaan	Marriages	9	15	6
	Divorces	1	1	1

Overall, the two soums recorded 52 marriages and 8 divorces during the period. These indicators should be interpreted in relation to household stability, population dynamics, and demand for social services.

3.4.2. Household Structure of Surveyed Households

According to the household survey, 80 percent of households are nuclear families and 20 percent are extended families. The average household size is three persons, indicating that small to medium-sized households predominate in the area of influence. Sixty percent of surveyed households consist of 1–3 members, while 40 percent have 4–6 members. This is relevant for household-level information disclosure, safety messaging, and vulnerability assessment.

Table 31. Household Type and Average Household Size

Household type	Share of households	Average household size
Nuclear family	80%	3
Extended family	20%	5

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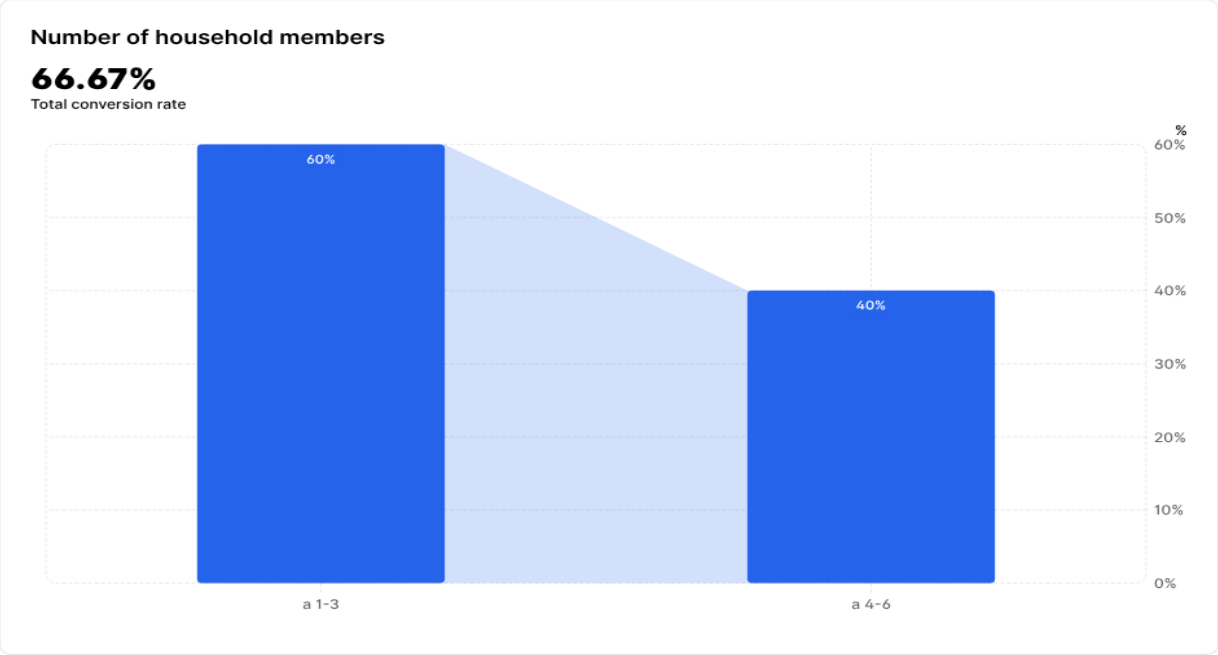


***Graph 4**. Number of household members*

3.5. Vital events and population dynamics

3.5.1. Births and Deaths

In Taragt Soum, the number of births declined over 2022–2024, while deaths showed an increasing trend. In Khairkhandulaan Soum, births also declined, whereas the annual number of deaths fluctuated. These indicators suggest that natural population growth is continuing but at a slower pace. Over the longer term, such trends may affect the structure of services, the labor market, and the broader socio-economic baseline.

Table 32. Births and Deaths

Soum	Indicator	2022	2023	2024
Taragt	Births	70	67	53
	Deaths	13	20	21
Khairkhandulaan	Births	70	59	56
	Deaths	21	26	18

Project relevance: During the construction phase, vital statistics are relevant to health service demand, service accessibility, and emergency response planning.

3.6. MIGRATION

Khairkhandulaan Soum recorded 88 in-migrants and 138 out-migrants during 2023–2024. Taragt Soum recorded 67 in-migrants and 118 out-migrants over the same period. The intensification of migration during 2023–2024 may be linked to local livelihood conditions, employment, access to services, and changes in the regional economy.

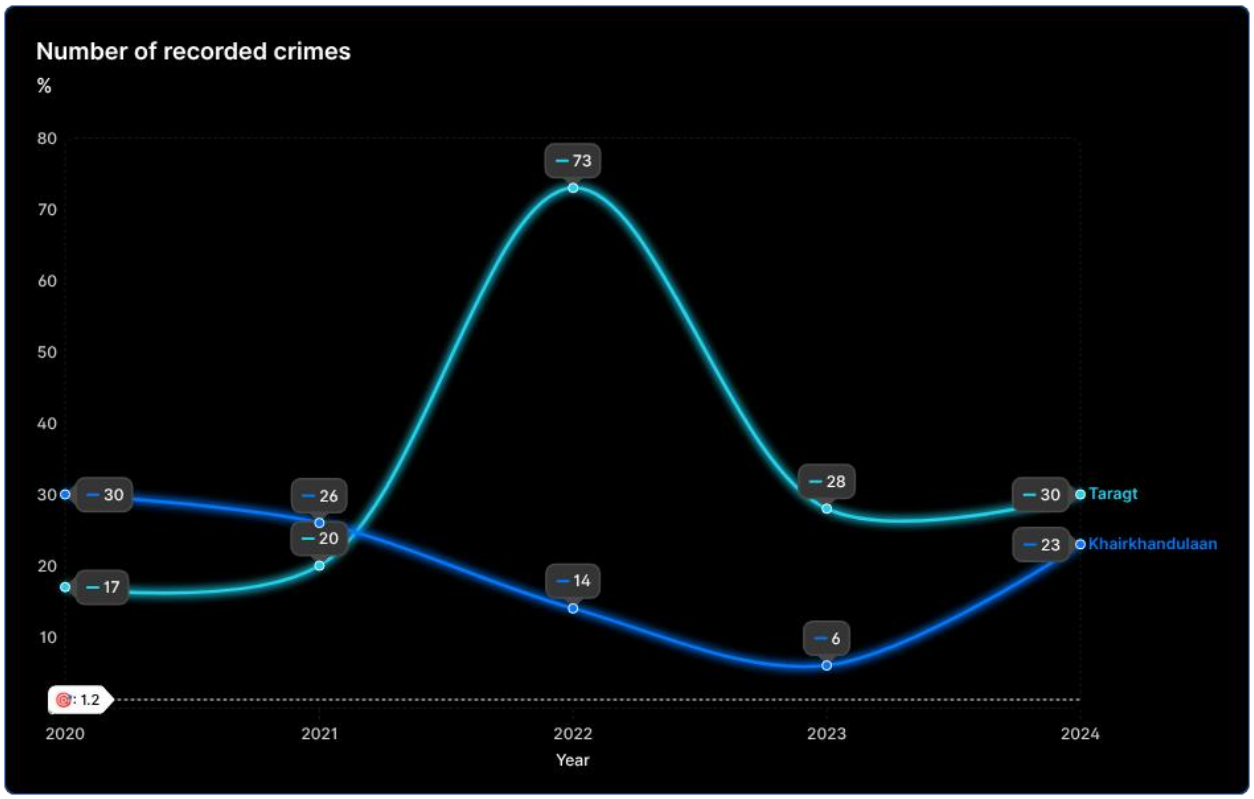
Table 33. Population Migration, 2020–2024

Movement	Soum	2023	2024	Total
In-migration	Khairkhandulaan	15	39	88
	Taragt	7	29	67
Out-migration	Khairkhandulaan	63	75	138
	Taragt	64	54	118

Both soums showed a marked increase in migration intensity during 2023–2024.

3.7. Crime and community safety

Soum-level statistical information indicates that crime levels fluctuate from year to year. In Khairkhandulaan Soum, an average of around 20 crimes per year was recorded over the past five years; crime declined between 2020 and 2023 but increased again in 2024. In Taragt Soum, the average was around 64 crimes per year, with a sharp increase in 2022, a decline in 2023, and a further increase in 2024. Crime levels in Taragt Soum are higher than in Khairkhandulaan Soum, which may be related to its proximity to the province center, roadside services, and concentration of settled households.



***Graph 5**. Number of recorded crimes*

The types of recorded crimes are summarized in the table below. In 2024, crimes against property and crimes against human health were relatively high in Taragt Soum, while in Khairkhandulaan Soum crimes against human health were the most frequently recorded.

Table 34. Types of Recorded Crime (2022–2024)

Crime category	Taragt 2022	Taragt 2023	Taragt 2024	Khairkhandulaan 2022	Khairkhandulaan 2023	Khairkhandulaan 2024
Fraud	5	0	2	2	0	2
Livestock theft	4	0	3	1	0	1
Crimes against public service interests	0	2	0	0	0	0
Crimes against property	27	9	8	5	1	5
Crimes against public safety and traffic	4	4	2	0	0	4
Embezzlement	1	1	0	1	0	0
Theft	12	6	3	1	1	1
Crimes against the right to life	0	1	1	1	0	0
Crimes against sexual freedom and integrity	1	0	0	0	0	0

Crimes against personal liberty	0	0	1	0	0	1
Crimes against human health	17	3	9	1	4	9
Intentional homicide	0	1	0	1	0	0
Driving a person to suicide	0	0	1	1	0	0
Environmental crimes	2	1	0	0	0	0
Total	73	28	30	14	6	23

According to information provided by the soum Governor's Offices, within the Project area of influence in Khairkhandulaan Soum there were three traffic accidents and two cases of driving under the influence over the past three years. For Taragt Soum, no project-area-specific case information was separately provided.

Project relevance: During construction, increased heavy vehicle movements, temporary detours, speed control regimes, worker camps, and inflow of external labor may create additional community health and safety risks, particularly in relation to road safety and the safe mobility of vulnerable groups. ESS4 requires assessment and mitigation of such risks, particularly traffic risks, hazardous materials, and emergency preparedness.

3.8. LAND USE

Under Mongolia's land legislation, land relations are regulated through the three main forms of land ownership, possession, and use. Within the Project-affected soums, the land use pattern is dominated by pastureland, winter and spring camps, and mining-related land use, while settled land use outside soum centers is relatively limited. In this context, the road rehabilitation project is more likely to generate impacts related to temporary land occupation, material sourcing areas, quarries, camps, temporary access roads, and access restrictions, rather than permanent land acquisition.

Table 35. Main Land Use Types in Project Soums

Administrative unit	Cropland	Pasture	Winter/ Spring camps	Mining	Infrastructure	Urban/ settlement development	Protected area	Research/ development
Taragt Soum	✓	✓	✓	✓	✓			
Khairkhandulaan Soum		✓	✓	✓	✓			

3.8.1. Agricultural and other land uses

As of 23 March 2026, 10,435.82 winter and spring camp plots covering 735.82 .1 hectares had been allocated in Uvurkhangai Province. According to information from the soum Governor's Offices, there are 25 cadastral possession plots along the alignment in Khairkhandulaan Soum, and 8 addressed winter/spring camp plots belonging to households in Taragt Soum.

These data indicate that planning of temporary use areas, material sources, temporary access roads, and camp locations should take into account not only cadastral registration, but also traditional seasonal pasture use, water points, livestock routes, and access to winter/spring camps.

3.8.2. Mining

No active mining extraction or exploration site has currently been identified within the Project's direct area of influence. However, mining and exploration license areas have been registered within the territories of the affected soums and in adjacent soums across administrative boundaries. Therefore, when selecting quarries, material sources, temporary roads, heavy vehicle routes, and water abstraction points, prior verification of potential overlaps with mining licenses, land rights conflicts, and associated safety risks is required.

Table 36. Mining and Exploration Licenses

No.	Name	License type	Area (ha)	Status	Holder	Location
1	Ergen Usni Khudag	Mining license	50.15	Valid	C A J I N	Uvurkhangai (Khairkhandulaan)
2	Ulziit	Mining license	164.29	Valid	Shargalbolor	Uvurkhangai (Khairkhandulaan)
3	Khuren Tolgoi	Exploration license	1262.1	Valid	Bayan Baga Khairkhan Dulaan	Uvurkhangai (Khairkhandulaan)
4	Ergen Us	Exploration license	3882.49	Valid	Erdeniin Gurvaljin	Uvurkhangai (Khairkhandulaan)
5	Tsagaan Jalga-4	Exploration license	7957.91	Valid	Khishig Rich Minerals	Uvurkhangai (Baruunbayan-Ulaan, Khairkhandulaan)
6	Surtiin Am	Mining license	309.32	Valid	Galt-Uneg	Uvurkhangai (Taragt)
7	Tashgai	Exploration license	27545.5	Valid	Bayan Khukh Tolgoi Tashgai	Uvurkhangai (Tugrug, Bayangol, Taragt, Guchin-Us)
8	Nariin Khadat	Exploration license	1529.83	Valid	Deed Saikhan	Uvurkhangai (Khairkhandulaan)
9	Sonduult-1	Exploration license	593.88	Valid	Agitkhangai	Uvurkhangai (Khairkhandulaan)
10	Ulaan Chuluut	Exploration license	14445.61	Valid	Lucky Gate	Uvurkhangai (Khairkhandulaan)
11	Gun Ovoo	Exploration license	7437.1	Valid	Usukh Bayalag Khar Alt	Uvurkhangai (Khairkhandulaan)
12	Burgast Khavtsgai	Exploration license	2221.28	Valid	Sodon Alkhtan	Uvurkhangai (Khairkhandulaan)
13	Nariin Khadat-1	Exploration license	10449.13	Valid	Evt Delger Khangai	Uvurkhangai (Khairkhandulaan, Taragt)

14	Sonduult	Exploration license	9087.41	Valid	Universal Logging	Uvurkhangai (Khairkhandulaan, Taragt)
15	Dulaan Khairkhan	Exploration license	6285.15	Valid	C A I L	Uvurkhangai (Taragt)
16	Bumbat Tolgoi	Exploration license	10215.64	Valid	Non Ferros Mining Mongolia	Uvurkhangai (Taragt)
17	Uguumur Tolgoi	Exploration license	35.82 90.65	Valid	Demon Engineering	Uvurkhangai (Taragt, Zuunbayan-Ulaan)
18	Ulziit Khushuu	Exploration license	2713.57	Valid	M N G H	Uvurkhangai (Taragt, Zuunbayan-Ulaan)
19	Tsoorkhoi / Baruun Urd Sair	Mining license	165.46	Valid	ETA Engi	Uvurkhangai (Khairkhandulaan)

A total of 19 valid licenses are recorded, of which 4 are mining licenses and 15 are exploration licenses. License concentration is relatively high in Khairkhandulaan Soum, while Taragt Soum also has both standalone and transboundary licenses. The presence of large exploration areas suggests the possibility of increased extraction activity in the future.

Project relevance: Although no mining operation has been identified within the Project's direct area of influence, the concentration of licenses within the soums may create land rights overlap, safety, and regulatory risks in the planning of material sources, temporary roads, and quarry sites.

3.9. CULTURAL HERITAGE AND HERITAGE SITES

Although there are many historical and cultural heritage sites in Taragt and Khairkhandulaan soums of Uvurkhangai Province, no state special protected area has been identified within the road alignment corridor. However, the "Great Horse Shrine of the Mongol People" is located alongside the road, attracts domestic and foreign tourists, and should be considered a sensitive receptor in the context of the Project.

Accordingly, the area surrounding this cultural heritage site requires integrated assessment of construction traffic arrangements, dust, noise, visual intrusion, temporary access constraints, visitor safety, and impacts on the income of local households engaged in trade and services associated with the site. A cultural heritage protection plan, chance finds procedure, appropriate signage, and temporary safe access arrangements should be integrated into construction management.

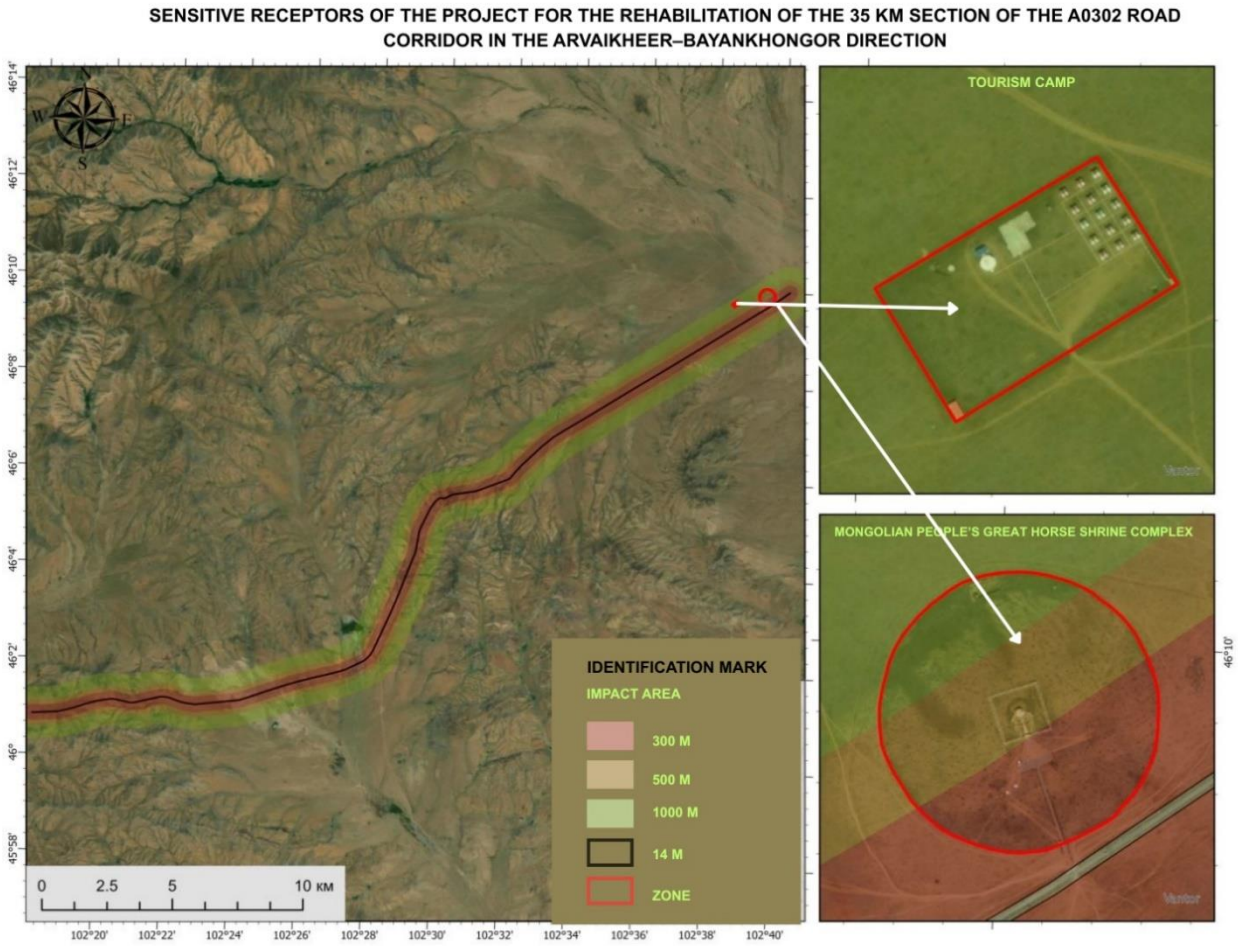


Figure 10.Sensitive receptors

3.10. INFRASTRUCTURE

3.10.1. Housing Type and Public Utility Services

Within the area of influence, ger dwellings predominate, alongside a combination of settled and semi-settled lifestyles. According to the survey, 85.7 percent of respondents reported living in gers, while the remaining respondents did not answer. Under such conditions, households may be more sensitive to dust, noise, temporary road closures, water access constraints, waste management issues, and changes in traffic safety conditions.

Household survey: Public utility services and housing type: As shown below, 85.7 percent of respondents live in gers, while 14.3 percent did not respond to the survey.

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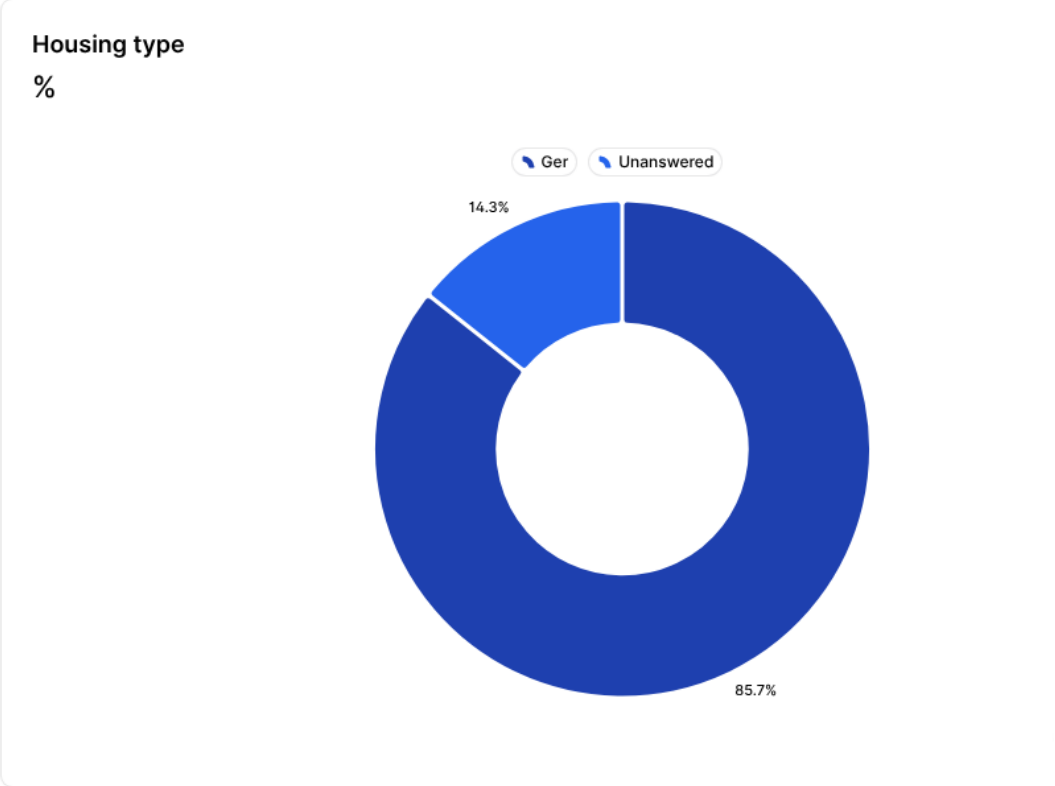


***Graph 6**. Housing type*

3.10.2. Electricity Supply

Within the Project area of influence, both centralized electricity supply and renewable energy sources are used. Soum center and settled consumers are connected to the centralized system, whereas solar energy is dominant among herder households. As of 2024, 292 out of 304 herder households in the Project Bags, or 96 percent, had access to an electricity source. The fact that 100 percent of surveyed households reported using solar power suggests that the survey mainly covered remote herder households.

Table 37. Sources of Electricity for Households

Bag	Indicator	2023	2024
Arvaintal	Solar	81	75
	Centralized system	47	70
Emeeltt	Solar	101	143
	Centralized system	18	4

The household survey also indicated that households use dung, coal, or a combination of both for heating. Construction camps, lighting, stationary equipment, maintenance yards, and security arrangements may create temporary additional demand on local energy supply. Therefore, electricity use, safe fuel storage, and fire safety should be properly planned. The EHS Guidelines recommend that risks associated with community safety, fire, emergency preparedness, energy, and equipment be assessed in a manner proportionate to Project conditions.

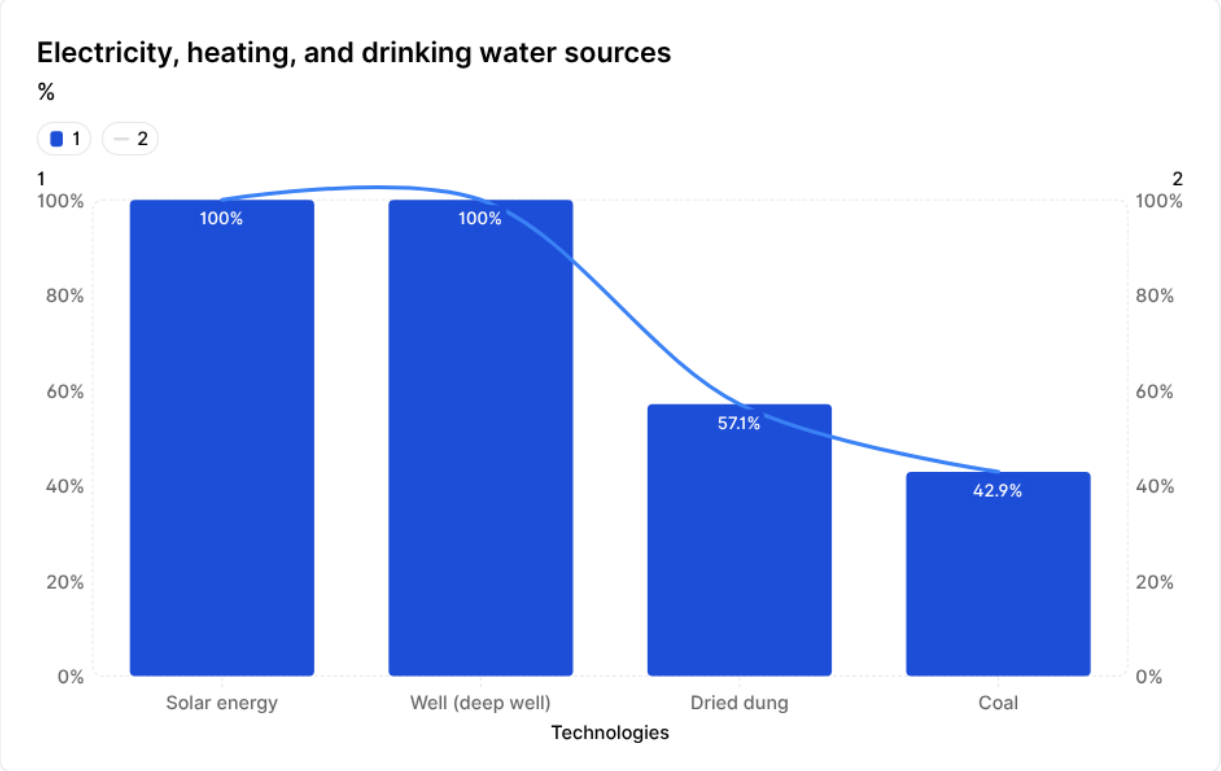


***Figure 11**. Sources of electricity, heating, and drinking water*

3.10.3. Water Supply

The soums within the area of influence are relatively vulnerable in terms of water resources, and water supply depends more on deep wells, protected and unprotected wells, and water kiosks than on centralized systems. Water demand for construction, camp wastewater, fuel and lubricant storage, vehicle washing, and temporary maintenance yards may adversely affect the quality and availability of drinking water sources. ESS4 requires assessment and mitigation of risks to water quality, water access, and community health.

Table 38. Sources of Water Supply in the Soums

Source of water supply	Taragt	Khairkhandulaan
Rivers, lakes, unprotected wells, springs, and other sources	574	801
Trucked water	0	0
Centralized and independent systems	0	3
Water not connected to centralized system	1	1
Water kiosks connected to centralized system	3	0
Protected springs	7	6
Protected wells	364	279
Bottled purified water	1	0
Total	950	1090

Table 39. Number of Wells by Type in the Bags

Bag	Short-pipe well	Other	Deep drilled well	Traditional dug well	Total
Arvaintal	2	29	17	75	123
Emeeltt	0	12	6	2	20

According to the household sample survey, complaints regarding water quality are high, with 100 percent of respondents indicating dissatisfaction with water quality and describing the water as “salty.” Therefore, construction-phase water use should be planned so as not to compete with local domestic and livestock needs; water should be abstracted only from approved sources; no adverse effects on water quality or access should occur; and preventive and response protocols should be applied for activities with spill and contamination risk.

3.11. Communications and access to information

Mobile phones are the primary means of communication in the Project area of influence. Bag governors disseminate local information through Facebook groups, phone calls, and verbal communication channels. Survey respondents reported that 42.9 percent obtain information from soum-level sources, 14.3 percent from traditional channels such as newspapers, television, and radio, and 28.6 percent from social media.

All surveyed households use mobile phones, all have two handsets, 71 percent are connected to the internet, and 29 percent do not have continuous internet access. All surveyed households reported having mobile network coverage and using DDISH. Under these conditions, Project information disclosure, notices about temporary closures and traffic arrangements, safety warnings, and the grievance mechanism should be communicated not only through digital channels but also through Bag-level networks, phones, public notices, meetings, and printed materials. ESS10 requires information to be understandable, accessible, timely, and proportionate to risk while ensuring inclusive participation.

3.12. TRANSPORT AND TRAFFIC

The Project road is strategically important for regional connectivity and for the movement of passengers and freight. The current deteriorated road condition creates road safety risks, and the rehabilitation works therefore represent an important investment to improve transport reliability, safety, and service access.

According to 2025 vehicle inspection registration data, 509 vehicles were registered in Taragt Soum and 536 in Khairkhandulaan Soum. During the construction period, temporary closures, detours, movements of heavy machinery, speed control regimes, livestock crossing risks, visibility constraints, and restricted access to service institutions may increase risk. The source text notes an indicative traffic volume range of 300–800 vehicles per day on state roads of this category, with 500–800 vehicles per day on the Arvaikheer–Nariinteel section and 300–600 vehicles per day on the Nariinteel–Bayankhongor section, increasing two- to threefold during Naadam and declining by 30–40 percent in winter. Although these figures require detailed source verification, they are highly relevant to the development of the Project’s Traffic Management Plan.

The household survey suggests relatively high vehicle ownership, with widespread combined use of passenger cars, motorcycles, and trucks. Households regularly travel to soum centers, the province center, and Ulaanbaatar, mainly for shopping, taking children to school and kindergarten, social and festive events, leisure, and health services.

Table 40. Frequency of Household Travel Using Private Vehicles

Indicator	To soum center	To province center	To capital city
Highest	3	28	3
Lowest	1	1	0
Average	2	14.5	1.5

Project relevance: Traffic safety is one of the Project's key social risks. ESS4 requires mitigation of Project-related traffic and road safety risks and protection of vulnerable road users. Accordingly, a Traffic Management Plan will be developed and implemented, covering temporary closures, detours, speed limits, traffic signs and markings, lighting, warnings for livestock grazing areas, and special arrangements near schools, health facilities, and cultural heritage sites.

3.13. Economic environment

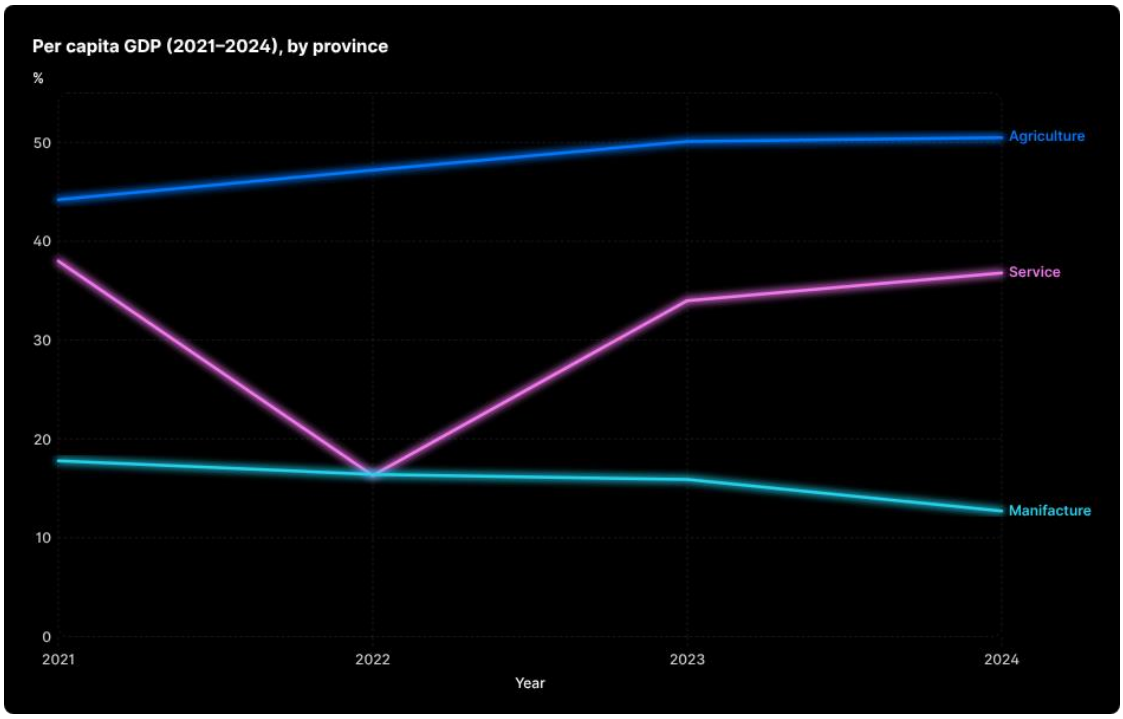
3.13.1. Gross Domestic Product of the Province

Per capita gross domestic product in Uvurkhangai Province increased steadily during 2021–2024 and reached approximately MNT 9.7 million in 2024. Sectoral composition shows that agriculture remains dominant, while the share of industry declined and the service sector fluctuated.

Table 41. Gross Domestic Product (2021–2024)

Indicator	2021	2022	2023	2024
Per capita GDP, thousand MNT	5198.2	6857.8	8305.5	9699.2
Share of agriculture	44.2	47.2	50.1	50.5
Share of industry	17.8	16.4	15.9	12.7
Share of services	38.0	36.3	34.0	36.8

This indicates that the economy of the Project area of influence, household income, employment, and seasonal cash flow remain highly dependent on agriculture and livestock production. Improvement of road conditions is therefore expected to enhance market access, service access, transport efficiency, and trade flows, although temporary construction disruptions may have short-term adverse effects.



***Graph 7**. Per capita GDP (2021–2024), by province*

3.14. Agriculture

3.14.1. Crop Production

According to statistical information, a total of 35.82 5.106 hectares of cultivated land was recorded in the Project-affected Bags of Taragt and Khairkhandulaan soums in 2025. However, field observations and information from the soum Governor's Offices indicate that no cropland was identified within the Project's direct area of influence. Therefore, direct overlap between the main road alignment and cropland is expected to be limited, although indirect impacts related to temporary roads, camps, transport routes, and quarry selection cannot be ruled out.

Table 42. Crop Production Indicators

Bag	Cultivated area, ha (2024)	Cultivated area, ha (2025)	Harvest, tons (2024)	Harvest, tons (2025)
Arvaintal	12.64	2.306	28.052	11.486
Emeelt	44.5	35.82 2.8	105	1061.6
Total	57.14	35.82 5.106	133.052	1073.09

3.14.2. Livestock Husbandry

Livestock husbandry is the principal livelihood source of households in the Project area of influence. As of 2025, a total of 307 herder households and 103.4 thousand head of livestock were recorded. In Arvaintal Bag of Taragt Soum, 41.2 thousand head of livestock were counted, and in Emeelt Bag of Khairkhandulaan Soum, 62.2 thousand head were counted. According to soum-level information, approximately 20 thousand livestock regularly graze within the Project area of influence. This means that road safety, livestock routes, pasture access, water points, and risks of livestock-vehicle collisions are central issues in the socio-economic assessment.

Table 43. Livestock Numbers by Bag and Species, 2022–2025

Bag	Species	2022	2023	2024	2025
Arvaintal	Horses	2.4	3.0	3.8	4.2
	Cattle	1.0	1.4	1.7	1.9
	Sheep	19.7	21.3	22.9	23.2
	Goats	10.5	11.7	12.9	12.0
Emeelt	Horses	3.9	4.4	5.2	5.7
	Cattle	2.1	2.5	3.1	3.8
	Sheep	24.4	26.9	29.5	28.9
	Goats	20.7	23.3	25.4	23.8

Table 44. Number of Herder Households, 2023–2025

Bag	2023	2024	2025	Change in 2024	Change in 2025
Arvaintal	127	129	136	1.60%	5.40%
Emeelt	169	169	171	0.00%	1.20%
Total	296	298	307	0.68%	3.02%

All households included in the sample survey practice livestock husbandry, and income from livestock-related activities constitutes the primary source of household income. Some households also earn wages or supplemental income from other sources, but many reported significant gaps between income and expenditure and indicated that household income is insufficient to meet needs. Dependence on credit is also high, with loans mainly used to purchase animal feed. This indicates a high degree of financial vulnerability. Therefore, temporary construction disruption, changes in market access, restrictions on livestock movement, and impacts on water source access may have noticeable effects on household livelihoods.

3.15. Employment

Employment in Uvurkhangai Province is relatively stable overall, with the agricultural sector accounting for a substantial share of employment. The employment rate among men is higher than among women, indicating a gender gap in labor market participation. At the soum level, 118 people are employed in state institutions in Khairkhandulaan Soum, with 62 registered unemployed persons, while in Taragt Soum 13 persons are registered as actively seeking employment. Women account for a relatively high share of registered unemployed persons and job seekers.

Table 45. Employment in Uvurkhangai Province

Indicator	2021	2022	2023	2024
Employed persons	54,600	51,737	48,373	55,500
Employed in agriculture	27,775	20,818	28,763	27,900
Male employed	29,35.82 2	27,293	25,236	29,108
Labor force participation rate	70.3	72.3	64.8	74.6

Project relevance: During construction, maximizing the use of local labor may generate positive direct income effects. However, job access, skill requirements, women's and vulnerable groups' participation, occupational health and safety, and equal opportunity should be addressed through labor management arrangements.

3.16. Vulnerability, access to public services, and gender

3.16.1. Objective and Scope of the Section

The purpose of this subsection is to define the baseline conditions relating to access to public services, education and health services, vulnerable and disadvantaged groups, gender participation, and community safety within the Project area of influence, and to establish the baseline information necessary to assess potential social risks and impacts during the construction phase. The assessment covers not only the presence of services but also the practical ability to access them, including distance, travel time, administrative burden, specific needs of vulnerable groups, and the interaction of these factors with traffic conditions.

Within the World Bank ESF, access to social services, community health and safety, participation of vulnerable groups, and the accessibility of information are core components of the Project's social risk profile. Therefore, the findings of this section should be used to inform the Stakeholder Engagement Plan, Grievance Mechanism, Traffic Management Plan, Emergency Preparedness arrangements, and community health and safety measures.

3.16.2. Access to Public Services

Review of the affected soums' budget revenue and expenditure during 2022–2024 indicates a growing local fiscal capacity. Based on the original data, budget expenditure increased by an average of 37.1 percent from 2022 to 2023 and by 29.0 percent from 2023 to 2024, while budget revenue increased by 24.5 percent from 2022 to 2023 and by 48.1 percent from 2023 to 2024. In 2024, budget revenue growth exceeded expenditure growth, indicating improved local fiscal capacity, particularly for infrastructure, environmental improvement, and service organization. However, rising budgets do not automatically mean that all households in the area of influence can easily access services. Actual access continues to depend heavily on remoteness, road conditions, access to information, documentation requirements, and service processing time.

According to the household survey, 73.7 percent of respondents reported experiencing difficulties in accessing public services. The most common barriers were time required (26.3 percent), distance (21.1 percent), difficulties in preparing required documents (10.5 percent), and other reasons (15.8 percent). These results suggest that the main barrier is not absence of institutions, but rather the functional accessibility of services, namely the ability to reach service points, receive services in a timely manner, and navigate administrative procedures. Therefore, Project information disclosure, consultation, and grievance management should not be concentrated only in the soum center, but should combine Bag-level outreach, telephone, face-to-face meetings, notices, and mobile channels. This is consistent with the ESS10 principle of risk-informed, accessible, and inclusive stakeholder engagement.

Table 46. Assessment of Access to Public Services

Indicator	Result	Explanation
Households reporting difficulties in accessing public services	73.7%	High level of access constraints
Time required	26.3%	Service duration, multiple procedural steps, centralization
Distance	21.1%	Spatial constraints affecting remote households

Difficulty preparing documents	10.5%	Administrative burden
Other reasons	15.8%	Other technical and organizational issues

Project relevance: Temporary road closures, mobility disruption, and delayed information during construction may place additional pressure on access to public services. The Project should therefore support continuity of access by ensuring prior notice, Bag-level information channels, and targeted communication mechanisms for vulnerable households.

3.16.3. Access to Education Services

According to 2025 statistical information, two general education schools are operating in the two Project-affected soums, serving a total of 454 students. In addition, 265 children are enrolled in pre-school education. The source text indicates that both the number of students and the number of children attending kindergarten have been declining over the last four years. This is consistent with the declining share of children in the population age structure and may have longer-term implications for the organization of education services and enrollment of children from mobile or seasonally migrating households.

The household sample survey indicates that complete secondary education is the dominant education level among household heads, while a share of household heads have only basic education. This suggests that Project information should be delivered in a simple, practical, and easily understandable format. In particular, construction safety information, temporary access arrangements, traffic control measures, warnings, and grievance channels should not rely solely on written communication but should also be delivered through verbal explanation, public signboards, and Bag-level leadership.

Table 47. Baseline Indicators for Education Services

Indicator	2025	Explanation
General education schools	2	Combined total for the two affected soums
Number of students	454	Shows a declining trend over the last 4 years
Children enrolled in pre-school education	265	Shows a declining trend over the last 4 years

Project relevance: Households with school- and kindergarten-age children represent a vulnerable user group that must be explicitly considered in construction-phase traffic management, signage, speed control, and safe crossing arrangements. ESS4 requires the identification and mitigation of risks to community safety, including vulnerable users.

3.16.4. Access to Health Services and Service Capacity

Primary and emergency health services are provided through health centers operating in the centers of the two affected soums. A total of 39 doctors and health workers are employed, including 20 in Taragt Soum and 19 in Khairkhandulaan Soum. In terms of staff composition, the facilities include Bag doctors, nurses, feldshers and other paramedical staff, laboratory personnel, midwives, and specialized health professionals, although capacity differences exist between the soums. For example, Taragt Soum has no laboratory technician, which limits access to certain diagnostic services. This indicates that basic health services are available at soum level, but some specialized care and diagnostic services remain dependent on the province center.

In terms of access, travel time from Taragt Soum to the province center is 90–120 minutes, while from Khairkhandulaan Soum it is around 80 minutes. In addition, travel times from the start and end points of the Project road to soum and province centers vary. This means that during construction, accidents, emergency calls, patient transport, temporary road closures, and heavy vehicle movements may directly affect practical access to health services. Health service capacity should therefore be assessed not only by staffing numbers, but also in relation to travel time, continuity of road access, emergency routes, and the reliability of communications.

The household sample survey indicates that 63.2 percent of respondents considered health services relatively accessible, while 31.6 percent stated that they experienced difficulty in obtaining services. In terms of location of service use, 68.4 percent use soum hospitals, 15.8 percent use Bag doctors, and 15.8 percent seek care at the province hospital. This indicates that the main burden of primary care remains at soum level, while the province center remains an important referral point. The main constraints affecting service quality and actual access include queues, high medicine prices, limited medicine supply, and insufficient access to doctors.

Table 48. Human Resources Structure of Soum Health Centers

Indicator	Taragt	Khairkhandulaan
Bag doctors	3	2
Other staff	1	1
Other feldshers/paramedical staff	3	1
Laboratory technicians	0	1
Nurses	4	4
Specialized medical professionals	9	9
Midwives	0	1
Total	20	19

Table 49. Assessment of Access to Health Services

Indicator	Result
Able to access services without difficulty	63.2%
Experience difficulty in accessing services	31.6%
No response	5.3%
Use soum hospital	68.4%
Use Bag doctor	15.8%
Use province hospital	15.8%

Project relevance: During construction, the risk of accidents, injuries, dust exposure, traffic disruption, temporary road closures, and delayed emergency access should be assessed in relation to the actual capacity of local health infrastructure. ESS4 requires identification of community health and safety risks and planning of preventive and response measures.

3.16.5. Vulnerable Groups, Gender, and Community Safety

The Project area of influence includes children, older persons, persons with disabilities, female-headed households, households without formal addresses, and remote households. According to information provided by the Khairkhandulaan Soum Governor's Office, the Project area includes 29 minors, 6 at-risk households, 2 persons with disabilities, 1 female-headed household, and 20 households without addresses. In Taragt Soum, 4 households without addresses, 15 female-headed households, and 85 persons with disabilities were recorded. While these figures confirm

the presence of vulnerable and disadvantaged groups, the final report should clarify whether the classification methodology used by the two soums is consistent. In particular, the discrepancy in the number of persons with disabilities should be validated in relation to differences in categorization, coverage, and administrative registration.

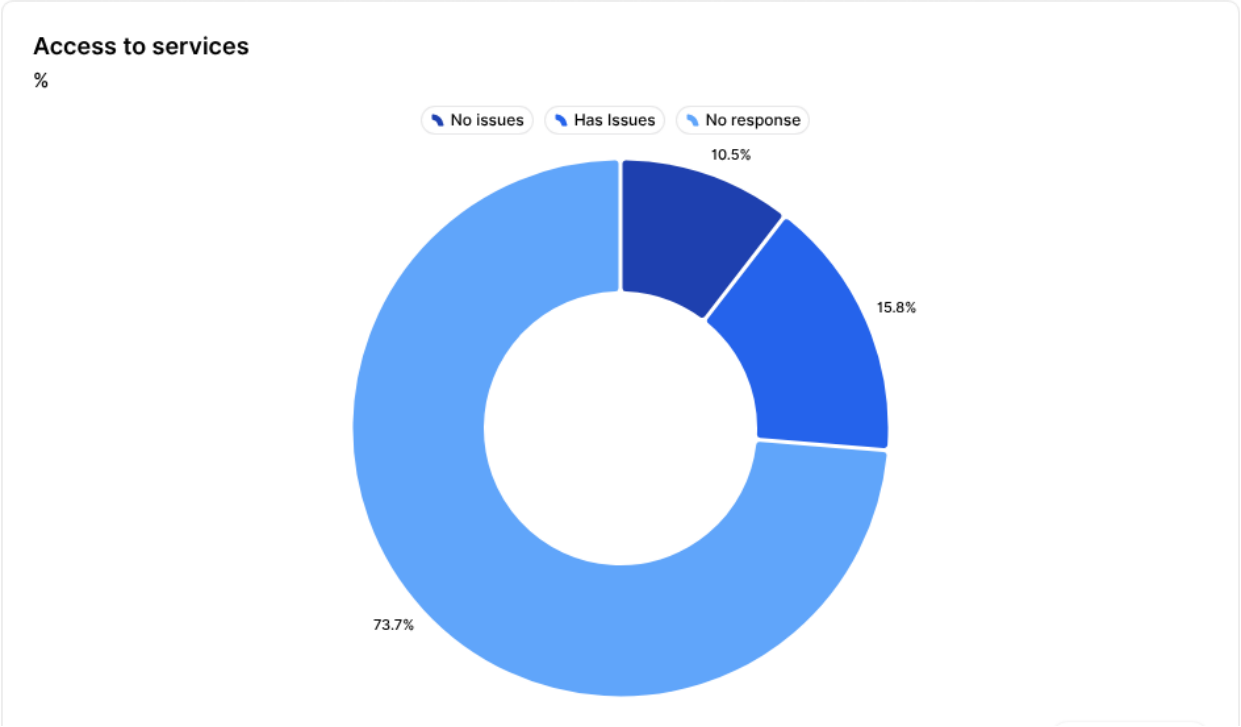
The household survey indicates that women's employment is concentrated primarily in livestock husbandry, while their share in paid employment is relatively low. However, women's participation in household budget decision-making is high. According to the survey, 28.6 percent of respondents said that household budget decisions are made jointly, while 53.1 percent said that the wife makes such decisions. This demonstrates that women play a significant role in household information flows, day-to-day expenditure, decision-making, and perception of risk. Project information disclosure, consultation, and grievance channels should therefore be designed to reach women directly.

During construction, children, older persons, persons with disabilities, single parents, and remote herder households may face heightened risks related to traffic safety, ability to move through temporarily restricted areas, access to water sources, access to public and health services, and the ability to receive timely information. Accordingly, community safety measures should incorporate dedicated arrangements for key movement points used by vulnerable groups, as well as schools, health facilities, water points, and service centers, including traffic signs, lighting, speed control, and the use of local communication channels. This is consistent with the ESS4 principle of protecting vulnerable groups from Project-related community exposure to risk.

Table 50. Key Indicators Relating to Vulnerable Groups

Indicator	Khairkhandulaan	Taragt	Explanation
Minors	29	not reported	Classification not uniform between soums
At-risk households	6	not reported	Requires additional verification
Persons with disabilities	2	85	Registration methodology should be verified
Female-headed households	1	15	Possible differences in soum-level classification
Households without formal address	20	4	Important indicator for information disclosure and access risk

Project relevance: The register of vulnerable and disadvantaged groups should be revalidated at Bag level before construction begins so that targeted information disclosure, safety arrangements, and dedicated grievance channels can be established. ESS10 requires early identification of affected parties, including vulnerable groups, and organization of participation in ways appropriate to their needs.



Graph 8. Access to public services

CHAPTER 4. LEGAL, STANDARDS, POLICY, AND INSTITUTIONAL FRAMEWORK

4.1. Purpose, scope, and core compliance principles of the chapter

The purpose of this chapter is to define the legal, policy, regulatory, procedural, standards, permitting, reporting, and institutional framework applicable to the planning, construction, temporary operation, operation of ancillary facilities, and closure stages of the “Rehabilitation of the A0302 Road along the Arvaikheer–Bayankhongor Corridor” subproject. As the Project is a road infrastructure investment implemented in Mongolia with financing from the World Bank, its implementation shall be governed jointly by the laws and regulations of Mongolia**,** the World Bank Environmental and Social Framework**,** the World Bank Environmental, Health, and Safety Guidelines**,** and the principles of the relevant international treaties and conventions to which Mongolia is a party. The World Bank Environmental and Social Framework has been in effect since 1 October 2018 and establishes the basic system under which borrowers are required to manage project risks and impacts throughout the project life cycle.

Although the Contractor may be a foreign company, any construction activity implemented within the territory of Mongolia is directly subject to Mongolian law. Accordingly, the residence, employment, work authorization, registration, labor contracts, social protection, occupational safety, community relations, codes of conduct, and information protection arrangements for foreign engineers, specialists, and workers must all comply with the applicable laws of Mongolia. The Law on Labour Migration provides the principal legal basis for these matters, and the number and percentage of foreign workers permitted for employment are determined by the Government on an annual basis. For 2026, the quota and percentage of foreign workers authorized for employment were approved by Government Resolution No. 113 of 1 October 2025**.**

The Project’s core compliance principles are structured as follows: first, the mandatory laws, permits, and administrative acts of Mongolia; second, the Environmental and Social Commitment Plan and the approved ESMP as reflected in the financing and project documents; third, the World Bank Environmental and Social Standards; fourth, the World Bank Environmental, Health, and Safety Guidelines; and fifth, the Contractor’s ESMP, internal procedures, codes, and methodologies. In the event of inconsistency among these instruments, the more stringent and more protective requirement shall prevail.

Table 51. Hierarchy of Legal and Compliance Requirements Applicable to the Project

Level	Type of Instrument	Legal Significance for the Project
I	Constitution of Mongolia, laws, permits, and administrative acts	Mandatory baseline requirements
II	Financing documents, Environmental and Social Commitment Plan, and approved ESMP	Project-specific compliance framework
III	World Bank Environmental and Social Standards	International requirements for risk and impact management
IV	World Bank Environmental, Health, and Safety Guidelines	Technical reference for good international industry practice
V	Contractor’s ESMP, internal procedures, methodologies, and codes	Site-level implementation and operational management arrangements

Source: Based on draft project chapters and the general requirements of the World Bank ESF.

4.2. World bank requirements

The World Bank Environmental and Social Framework establishes the core environmental and social requirements to be followed by borrowers in investment project financing. The Framework comprises ten Environmental and Social Standards and is intended to ensure early identification and mitigation of project risks and impacts, effective stakeholder engagement, protection of vulnerable groups, and continuous monitoring of project performance. For this road Rehabilitation subproject, ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, ESS8, and ESS10 are considered directly applicable.

Table 52. World Bank Environmental and Social Standards Applicable to the Project

ESS	Applicability	Relevance to the Subproject	Key Instruments / Measures
ESS1	Applicable	Road rehabilitation and maintenance works may generate environmental and social risks throughout the project cycle.	P-ESMP, C-ESMP, monitoring, reporting, corrective action procedures
ESS2	Applicable	Risks related to labor, OHS, worker welfare, grievances, and SEA/SH prevention	OHS Plan, labor arrangements, worker grievance mechanism, code of conduct, training, PPE
ESS3	Applicable	Resource use, emissions, dust, wastewater, waste, hazardous materials, and spill risks	Waste Management Plan, pollution controls, fuel and chemical handling, monitoring
ESS4	Applicable	Community safety, road user safety, construction traffic, access restrictions, and camp-related risks	Traffic Management Plan, public information, emergency response, community safety controls
ESS5	Screening relevance	Temporary land use or temporary restrictions may arise even if permanent acquisition is not currently expected	Screening, temporary land documentation, consultation, management measures if needed
ESS6	Applicable	Protected area sensitivity, habitat disturbance, vegetation loss, biodiversity risks	Protected area controls, biodiversity measures, land restoration, monitoring
ESS7	Not currently applicable	No qualifying groups identified within the area of influence based on available information	Maintain screening confirmation during implementation
ESS8	Applicable	Risk of chance finds and impacts on tangible or intangible cultural heritage	Cultural heritage screening, consultation, Chance Find Procedure, training
ESS9	Not applicable	No financial intermediary financing arrangement	Not applicable
ESS10	Applicable	Multiple affected and interested stakeholders require disclosure and engagement	Stakeholder engagement, information disclosure, grievance redress, consultation records

Source: World Bank Environmental and Social Standards.

4.3. World bank environmental, health, and safety guidelines

The World Bank Environmental, Health, and Safety Guidelines are technical reference documents reflecting good international industry practice and consist of general guidelines and sector-specific guidelines. According to IFC, the General EHS Guidelines were most recently updated in December 2024 and are intended to be applied together with the relevant sector-specific guidelines for the project in question. In the road sector, the EHS Guidelines for Toll Roads are

applicable to the construction, operation, and maintenance of major paved road projects, including bridges and grade-separated structures.

Table 53. Application of the Environmental, Health, and Safety Guidelines to the Project

Guideline Category	Main Issues Relevant to the Project
General EHS Guidelines Environment	Air emissions, dust, noise, vibration, waste, wastewater, hazardous materials
General EHS Guidelines Occupational Health and Safety	Hazard identification, PPE, exposure control, workplace conditions, incident management
General EHS guidelines Community Health and Safety	Traffic, public exposure, emergency response, hazardous transport, disease prevention
Good practice notes	Assessing and Managing the Risks of Adverse Impacts on Communities from Project-Related Labor Influx
Good practice notes	Road Safety
Good practice notes	Addressing Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) in Human Development Operations
Road sector guidelines	Temporary traffic arrangements, slope stability, drainage structures, roadside hazards, and construction-phase safety

Source: World Bank / IFC General EHS Guidelines and sector-specific EHS Guidelines for roads.

4.4. National policy and strategic documents of mongolia

The Project must be aligned not only with sector-specific legislation but also with Mongolia's broader national development policy documents. "Vision–2050" is Mongolia's long-term development policy framework and requires progress reviews and evaluations to be reported to Parliament every five years. The New Revival Policy establishes the macro-level policy framework for border recovery, transport, infrastructure, and logistics development. By contrast, the State Policy on the Road Transport Sector (2018–2026) is identified in the Legal Information System as a repealed legal act; therefore, it should not be treated in the report as a currently binding policy instrument, but rather as a historical and contextual policy reference.

Table 54. Policy Documents Relevant to the Project

Policy Document	Status	Relevance to the Project
Vision–2050: Long-Term Development Policy of Mongolia	In force	Long-term framework for infrastructure, regional development, and sustainable development
Action Plan for Implementation of Vision–2050 during 2021–2030	In force	Linkage among sectors, regions, and implementation phases relevant to the Project
New Revival Policy	In force	Policy framework for logistics, transport, and infrastructure recovery
State Policy on the Road Transport Sector (2018–2026)	Marked as repealed	Historical and interpretive policy reference for the sector

Source: Relevant resolutions and policy documents in the Integrated Legal Information System.

4.5. Applicable Mongolian legislation

To improve clarity, the legislation relevant to Project implementation has been consolidated under the following categories:

1. general administration, permitting, and information disclosure;

2. environment, natural resources, and cultural heritage;
3. land, roads, and traffic;
4. labour, social protection, health, and hygiene;
5. foreign labour, foreign nationals, and customs; and
6. fire safety, disaster protection, and security.

Table 55. Legislation on General Administration, Permitting, and Information Disclosure

No.	Legal Instrument	Date / Year Adopted	Main Relevance to Project Implementation
1	Constitution of Mongolia	12.02.1992	Provides the constitutional basis for the right to live in a healthy and safe environment, property rights, and lawful interests
2	Law on Permits	2022	Establishes the general regime for project permits, renewals, registration, and regulatory oversight
3	Law on Transparency of Public Information	17.12.2021	Governs information disclosure, reporting, and public access to information
4	Law on Resolving Petitions and Complaints Submitted by Citizens to State Bodies and Officials	1995	Provides the legal basis for linkage with the project-level grievance redress mechanism
5	Law on Personal Data Protection	17.12.2021	Governs the protection of worker information, sensitive complaints, and confidential records
6	Law on the Administrative and Territorial Units of Mongolia and Their Governance	2020	Governs coordination, notification, and interaction with province, soum, and Bag authorities

Source: Integrated Legal Information System and draft project chapters.

Table 56. Legislation on Environment, Natural Resources, and Cultural Heritage

No.	Legal Instrument	Date / Year Adopted	Main Relevance to Project Implementation
1	Law on Environmental Protection	30.03.1995	Establishes the general environmental protection framework, obligations, and oversight
2	Law on Environmental Impact Assessment	17.05.2012	Governs assessment, management planning, monitoring, and reporting
3	Law on Air	17.05.2012	Relevant to dust, emissions, asphalt plant operation, and machinery
4	Water Law	17.05.2012	Governs water abstraction, protection of water sources, and obligations of water users
5	Law on Meteorology, Hydrology, and Environmental Monitoring	13.11.1997	Relevant to environmental monitoring and use of hydrometeorological risk information
6	Law on Soil Protection and Prevention of Desertification	17.05.2012	Governs topsoil stripping, soil disturbance, erosion, and rehabilitation
7	Law on Plant Health and Plant Protection	05.06.2024	Relevant to vegetation cover, vegetation removal, and biological protection measures

8	Law on Fauna	17.05.2012	Relevant to fauna, habitats, and road-related impacts on wildlife
9	Law on Waste Management	12.05.2017	Governs management of non-hazardous and hazardous waste
10	Law on Toxic and Hazardous Chemicals	2006	Relevant to bitumen, oil, fuel, and chemical hazards
11	Law on Protection of Cultural Heritage	15.05.2014	Relevant to chance finds and protection of sensitive cultural sites
12	Law on Culture	2021	Relevant to local cultural settings and sensitive public heritage assets
13	Law on Special Protected Areas	1994	Relevant to restrictions associated with proximity to protected areas

Source: Integrated Legal Information System and draft project chapters.

Table 57. Legislation on Land, Roads, Labour, Health, and Foreign Workforce

No.	Legal Instrument	Date / Year Adopted	Main Relevance to Project Implementation
1	Land Law	07.06.2002	Governs temporary land use, camps, quarries, stockpiles, and rehabilitation
2	Law on Roads	11.05.2017	Governs road works, access points, road structures, and excavation permits
3	Law on Road Traffic Safety	08.07.2015	Governs temporary traffic schemes, speed restrictions, signage, and traffic control
4	Labour Law / revised version /	02.07.2021	Governs labour contracts, working conditions, discipline, and labour disputes
5	Law on Occupational Safety and Health	22.05.2008	Governs hazard identification, risk assessment, protective equipment, and OHS oversight
6	General Law on Social Insurance	07.07.2023	Governs insurance, contributions, and protection related to occupational accidents
7	Law on Health	05.05.2011	Governs access to primary health care and health services
8	Law on Hygiene	04.02.2016	Governs camp hygiene and hygienic conditions in workplaces and living areas
9	Law on Ensuring the Safety of Food Products	20.12.2012	Governs food safety for camp kitchens, storage, and transport
10	Law on Ensuring Gender Equality	02.02.2011	Governs non-discrimination and equal participation
11	Law on Child Protection / revised version /	17.01.2024	Relevant to child safety along the road and community safety measures
12	Law on the Rights of the Child	2016	Establishes the foundational principles of child rights and protection
13	Law on Herders	05.06.2024	Relevant to herders, pasture users, livestock crossings, and seasonal movement
14	Law on the Legal Status of Foreign Nationals	08.07.2010	Governs residence, registration, visas, and legal status
15	Law on Labour Migration	24.12.2021	Governs work permits, employment of foreign workers, and annual quotas

16	Customs Law	2008	Governs importation of equipment, machinery, materials, and chemicals
17	Law on Fire Safety	02.07.2015	Relevant to fire risk, fuel storage, warehouses, and preparedness
18	Law on Disaster Protection	02.02.2017	Governs emergency situations, accidents, floods, spills, and evacuation
19	Law on Contracted Security Services	2000, amended in 2023	Relevant to camp, warehouse, and fuel storage security arrangements
20	Law on Energy Conservation	26.11.2015	Relevant to energy use in camps, generators, lighting, and temporary facilities
21	Law on Renewable Energy	11.01.2007	Relevant to the possible use of renewable energy at camps and temporary facilities

Source: Integrated Legal Information System and draft project chapters.

4.6. International treaties and conventions

Mongolia is a party to international treaties and conventions relating to the environment, biodiversity, climate change, wetlands, hazardous waste, and persistent organic pollutants. The principles of these instruments are relevant to the Project's environmental and social management framework. For road infrastructure projects, these conventions are particularly important in relation to biodiversity protection, aquatic environments, hazardous waste management, and climate-related risks.

Table 58. International Treaties and Conventions Relevant to the Project

Convention	Relevance to the Project
Convention on Biological Diversity	Protection of habitats, vegetation, and fauna
Ramsar Convention on Wetlands	Impacts on water environments and sensitive wetland areas
United Nations Framework Convention on Climate Change	Climate risks and adaptation measures
Stockholm Convention	Risks related to persistent organic pollutants
Basel Convention	Principles governing the movement and disposal of hazardous waste

This list consolidates the principal conventions most directly relevant to environmental management under the Project.

4.7. Rules, procedures, and administrative regulatory instruments

Project implementation is not limited to compliance with laws and standards alone; it must also comply with relevant rules, model procedures, contract templates, and administrative regulatory instruments. The Procedure for Preparation, Review, Approval, and Reporting of Environmental Management Plans was approved by Order No. A/618 dated 29 October 2019, replacing the previous procedure issued in 2014. Under the standard water use agreement template, the water use conclusion, water use permit, wastewater discharge conclusion, and wastewater discharge permit form integral parts of the agreement, and implementation is assessed annually. In addition, under the normative requirements for establishing an occupational safety and health committee and appointing dedicated staff, an enterprise engaged in production or services with 50 to 100

workers must have at least one full-time OHS officer, while enterprises with more than 100 workers must establish a dedicated OHS structure.

Table 59. Key Rules and Regulatory Instruments Applicable to the Project

Instrument	Year	Scope of Application to the Project
Procedure for Preparation, Review, Approval, and Reporting of Environmental Management Plans	2019	Preparation, approval, and reporting of the annual environmental management plan
Standard Water Use Agreement Template	2018	Water abstraction, wastewater discharge rights, and contractual conditions
Normative Requirements for Establishment of Occupational Safety and Health Councils and Appointment of Full-Time Staff	In force	Requires at least one OHS officer for enterprises with 50–100 workers, and a dedicated structure for those with more than 100 workers
Model Procedure for the Operation of Occupational Safety and Health Councils in Enterprises and Organizations	2015	Composition, functions, and meeting arrangements of OHS councils
Annual Government Resolution Establishing the Number and Percentage of Foreign Workers	Annual	Sector-specific annual quota and numerical limitation on foreign employment

Source: Integrated Legal Information System.

4.8. National standards and technical reference documents

The standards listed in the draft submitted by the user have been reorganized and consolidated below for use in the ESMP. These standards constitute the main technical basis for monitoring, testing, occupational safety, camp welfare, and rehabilitation during Project implementation. The standard codes and years have been retained in the form used in the Project materials; however, before procurement, contracting, or commencement of laboratory monitoring, the latest valid edition of each standard should be reconfirmed through the official national standards registry.

Table 60. Categorized List of Core Standards Applicable to the Project

Category	Indicative Standard Set	Scope of Application to the Project
Air quality	MNS 4585:2025; MNS 5885:2008; MNS ISO 4226:2000	Ambient air, emissions, measurements
Noise and workplace conditions	MNS 5387:2004; MNS 4996:2000; MNS ISO 5128:2005; MNS 0017-5-1-21:1992	Workplace conditions, cabins, operator environment, motor vehicles
Water and sampling	MNS 0900:2018; MNS 4047:1988; MNS 4586:2024; MNS ISO 5667-6, 10, 11	Monitoring of rivers, groundwater, and wastewater
Soil	MNS 3297:2019; MNS 3298:1991; MNS 3307:1991; MNS 5850:2019	Soil contamination, sampling, and chemical analysis
Rehabilitation	MNS 5914:2008; MNS 5916:2008;	Topsoil management, rehabilitation, revegetation

	MNS 5918:2023; MNS 4920:2000	
Occupational safety	MNS 4967:2000; MNS 4968:2000; MNS 4990:2023; MNS 4991:2000; MNS ISO 45001:2018	OHS documentation and workplace risk management
Fire safety and emergency preparedness	MNS 4244:1994; MNS 4284:2017; MNS 5566:2020; MNS ISO 22320:2015; MNS 6392:2013; MNS 6400:2013	Fire classification, equipment, emergency management
Camps, welfare, and food	MNS 4946:2019; MNS 5992:2009; MNS 5027:2001; MNS 5364:2011; MNS 5271:2003; MNS ISO 22000:2019	Kitchens, storage, sanitation, and food safety
Roads and safety signage	MNS 5216:2011; MNS 7042:2024	Warning signs, temporary barriers, fencing
Heavy machinery and electricity	MNS 1800:1973; MNS 5151:2002	Lifting equipment, generators, electrical safety
Microclimate and lighting	MNS 5105:2023; MNS 5150:2023; MNS 5080:2023	Night work, enclosed spaces, and working condition assessment

Source: Consolidated from the list of standards contained in the draft project chapters.

4.9. Permitting, registration, and reporting system required for the project

The principal evidence of Project compliance is the integrated system of permits, registrations, and reporting. Before the commencement of works and throughout the construction period, the Contractor shall maintain a consolidated register of permits, contracts, approvals, and compliance records, and shall continuously monitor validity periods, conditions, limitations, and renewal dates. This system will serve as the primary evidentiary basis for Engineer supervision, Employer oversight, World Bank supervision, and audit.

Table 61. Required permits and approvals

Permit / Approval	Responsible Party	Timing	Approving Authority
ESMP/ESMP approval	IPIU / Contractor	Before mobilization	Ministry of Environment and Climate Change (MECC); aimag Environmental department
Water abstraction or utilization permit	Contractor	Before any drilling or water use	River Basin Authority (Water Authority)
Quarry/borrow pit operating permit	Contractor	Before quarry operations commence	Aimag Geology and Mining Authority

Spoil disposal site approval	IPIU / Contractor	Before earthworks begin	Aimag Environmental Agency; soum authorities
Camp siting (temporary land utilization) permission	Contractor	Before camp construction	Soum Governor's Office; aimag Environmental Department, Land management department
Asphalt plant / crusher siting (if on separate site)	Contractor	Before installation	Aimag Environmental Agency; soum authorities
Waste collection/disposal contract	Contractor	Before mobilization	Licensed waste management operator
Hazardous waste storage and disposal authorization	Contractor	Before mobilization	Aimag Environmental Agency (under Waste Law Art. 22–23)
Road occupation / traffic management approval	Contractor	Before any lane closure or diversion	Traffic Police; MRT
Temporary land use agreement	IPIU / Contractor	Before any use of land outside the ROW	Soum Governor; herder consent (documented)
Cultural heritage notification	PIU / Contractor	If chance find occurs	Aimag Culture Department; Institute of Archaeology
Worker foreign employment permits	Contractor	Before foreign workers enter Mongolia	Ministry of Labour and Social Protection

Source: Draft project chapter, standard water use agreement template, procedure for environmental management plans, and annual foreign labour quota arrangements.

CHAPTER 5. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PROJECT

This chapter examines the current environmental and social conditions within the Project area and identifies the potential adverse and beneficial impacts associated with the local road Rehabilitation project. The assessment is based on field observations, interviews and questionnaire surveys conducted with local residents and relevant institutions, and review of secondary source information.

5.1. Environmental and social impacts of the project

Implementation of the Project, which involves Rehabilitation of a continuous 35.82 km section of the road network, is expected to improve road infrastructure and transport logistics and thereby create favorable conditions for faster and lower-cost market access for goods and services from sectors such as livestock husbandry, crop production, small and medium enterprises, and tourism. However, during the road rehabilitation works, adverse impacts such as soil disturbance, dust generation, and noise are likely to occur. It is therefore essential that the Project be implemented in an environmentally sound and sustainable manner.

This section presents the potential environmental and social consequences arising from subproject activities and describes the corresponding mitigation measures and management approaches in both narrative and summary form.

5.1.1. Environmental Impacts

Unlike a new road construction project, this road rehabilitation project is expected to generate comparatively lower environmental impacts. Nevertheless, it may still result in both temporary and permanent adverse impacts to a certain extent. As the road corridor falls within a Class I corridor classification, the Project's environmental and social risk is substantial.

The Project is also expected to generate certain beneficial environmental effects. Rehabilitation of the road pavement and improvement of surface smoothness will enable more efficient vehicle movement, improve fuel combustion efficiency, and reduce dust and exhaust emissions, thereby contributing to improved local air quality. In addition, upgrading drainage structures along the road will reduce the risk of standing rainwater, soil erosion, and shoulder collapse, and will play an important role in protecting soil quality.

At the same time, improved road corridors may attract increased traffic volumes, which could partially offset some of the environmental benefits generated by the rehabilitation works.

Beneficial Impacts

- **Reduced dust generation and improved air quality:** Roads in poor condition generate substantial dust, particularly during dry and windy seasons. Under the Project, pavement rehabilitation, grading, and drainage improvements are expected to reduce dust emissions along the road corridor. Reduced dust levels will improve air quality and decrease adverse effects on human respiratory health as well as on livestock and wildlife.
- **Reduced land degradation and soil erosion:** Stabilization of side slopes and proper design and implementation of drainage structures under the rehabilitation works will help

maintain natural runoff patterns and reduce damage and erosion affecting the road base and surrounding soils. This will also limit off-road vehicle movement and reduce the risk of pasture degradation and soil deterioration.

- **Reduced fuel consumption and air pollutant emissions:** Smoother and more even road surfaces improve vehicle operating efficiency and reduce fuel consumption. As a result, emissions of carbon dioxide (CO_2), nitrogen oxides (NO_x)**,** and particulate matter (PM10 and PM2.5) from vehicles are expected to decline, generating localized environmental benefits and contributing to improved ambient conditions.

Adverse Impacts

- Impacts associated with land use: During rehabilitation works, activities such as establishment of temporary access roads, placement of construction material storage areas, and siting of machinery may result in temporary land occupation and localized soil disturbance.
- Impacts on air quality: During project implementation, earthworks, road grading, and movement of vehicles may generate dust, smoke, and pollutant emissions. In addition, diesel-powered heavy machinery may emit air pollutants such as CO_2, NO_2, and SO_2, which may temporarily affect ambient air quality in the project area.
- Noise and vibration impacts: Operation of heavy vehicles and machinery will generate noise and vibration, which may adversely affect the comfort and well-being of residents located near the works area. During construction, noise levels may reach approximately 70–90 dB, which may exceed the applicable ambient noise limit referenced in the national standard cited in the source text.
- Solid waste and maintenance-related waste: Road rehabilitation works will generate domestic waste from workers, damaged pavement material, and used oil and lubricants. These waste streams must be properly collected, segregated, and disposed of in accordance with applicable requirements.
- Impacts on water resources and surface water: During rehabilitation or cleaning of drainage ditches and culverts, sludge, sediment, and suspended solids may enter nearby surface water bodies. This risk may increase during periods of heavy rainfall when soil washout is more likely. However, if the works are properly planned and implemented in phases, and appropriate water protection measures are applied, the impact is expected to remain short-term and limited in magnitude.
- Risks associated with hazardous substances and fuels/lubricants: During operation of heavy equipment, there is a risk of fuel, oil, or lubricant leakage and spillage. Such incidents may adversely affect soil and water quality. Accordingly, fuel and lubricant storage and refueling areas must be established and managed in accordance with applicable standards, with spill prevention and response measures in place.
- Impacts on natural habitat, critical habitat, and wildlife movement: In accordance with World Bank ESS6, all project components, including the road corridor, quarry and borrow pit sites, temporary roads, camps, haul routes, and ancillary facilities, shall be assessed against the definitions of modified habitat, natural habitat, and critical habitat.
- Impacts on vegetation and habitat degradation: During construction activities, including earthworks, establishment of temporary access roads, quarry operation, material storage areas, and ancillary facilities, vegetation loss, habitat fragmentation, and degradation of sensitive ecosystems may occur. These impacts may adversely affect wildlife distribution, migration routes, and the ecological integrity of the surrounding habitats.
- **Impacts on wildlife:** Construction-related noise, lighting, dust generation, and vehicle movement may disturb wildlife, causing displacement from habitat areas and disruption of movement corridors. In addition, the Project may increase the risk of wildlife-vehicle collisions and uncontrolled human access into sensitive habitat areas.

5.1.2. Socio-Economic Impacts

The subproject involving Rehabilitation of a continuous 35.82 km section of the A0302 road corridor between Arvaikheer and Bayankhongor is expected to generate both positive and negative socio-economic impacts throughout all project phases, including the pre-construction, construction, and operation stages. This assessment is based on the socio-economic baseline conditions within the area of influence, the predominance of livestock-based livelihoods, characteristics of road use, and tourism flows.

In terms of beneficial impacts, the pre-construction phase will create opportunities for enhanced public consultation improved access to project – related information, and increased community awareness and participation in the Project. Preparatory activities may also create opportunities for local employment and enable small and medium enterprises in supply, transport, and service sectors to participate in the project supply chain.

During construction, the Project is expected to generate direct positive economic effects by providing temporary employment opportunities for local residents, increasing household income, and stimulating local demand for food, fuel, transport, and repair services. Furthermore, improved road conditions are expected to shorten travel time, improve reliability of transport services, and, provided that appropriate safety measures are in place, improve road safety.

In the longer term, improved regional connectivity is expected to enhance access to markets for livestock and agricultural products, increase tourism flows, improve access to social services such as health and education, support diversification of the local economy, and contribute to reduced out-migration from rural areas.

At the same time, certain adverse impacts and risks may arise during Project implementation. During the pre-construction and construction phases, temporary land use associated with camps, quarries, stockpile areas, and related facilities may restrict herders' access to pasture, and water sources and points, seasonal grazing areas, and may interfere with traditional livestock migration routes. Inadequate information disclosure, insufficient consultation, or misunderstandings of project activities may also give rise to community concern, grievances opposition, or local disputes. During construction, road closures and use of temporary diversions may disrupt daily mobility, livestock-related activities, and tourism flows.

Dust, noise, and vibration, and other emissions generated by construction activities may degrade the living environment of nearby households, reduce the quality of services in tourism- sensitive areas, and affect traffic safety through reduced visibility. In addition, increased movement of construction machinery and heavy vehicles, combined with inadequate temporary traffic management, signs, or markings and flagging systems, may increase accident risks for drivers, pedestrians, and herders.

Temporary worker presence may place pressure on the local social environment and create risks of social tension, spread of communicable diseases, inappropriate behavior, and gender-related risks, including SEA/SH, even if the likelihood is considered low to moderate depending on sire conditions. Poor camp management may also increase pressure on water resources, waste management systems, and health services, and may contribute to local pollution.

During the operation phase, improved road surfaces may encourage higher vehicle speeds. If road geometry, intersections, access points, signs, markings, and traffic calming measures are not adequately designed and maintained, there is a significant risk that both the frequency and severity of traffic accidents may increase. This risk is particularly relevant in areas with frequent livestock movement across the road, and may pose heightened risks to children and elderly persons. Improved accessibility may also increase traffic flows, alter local social patterns, intensify cultural influences, increase risks to vulnerable groups, and potentially contribute to wider transmission of communicable diseases as a secondary impact.

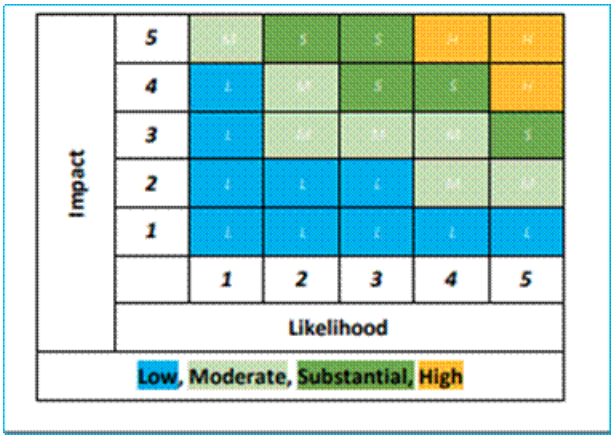
In addition, if road maintenance is not carried out adequately during operation, deterioration of the pavement may accelerate, and malfunction of the drainage system may create flood damage, physical deterioration, and road safety risks. If post-construction rehabilitation is not properly implemented, pasture degradation may persist, and poor management of roadside waste may result in ongoing residual pollution impacts.

Accordingly, effective implementation of the ESMP throughout all project phases, together with sound road safety engineering, stakeholder engagement, transparent information disclosure, regular monitoring, and a functional maintenance system, will be critical avoiding, minimizing and managing the above adverse impacts and risks.

5.2. Risk identification methodology

Potential environmental and social risks arising during project implementation were assessed by considering both likelihood and potential severity in accordance with the risk classification approach presented table below.

Table 62. Risk Rating Scale



Risk Level	Description
High	Substantial potential harm to people or communities if unmitigated; requires priority action and close monitoring.
Substantial	Moderate-to-high likelihood or severity; material risk that requires dedicated mitigation and monitoring.
Moderate	Manageable risk with standard mitigation measures; monitoring required to confirm effectiveness.
Low	Minor or unlikely impact; addressed through routine management controls.

5.3. Environmental and social management plan

Table 63. ENVIRONMENTAL AND SOCIAL RISK MITIGATION PLAN

No.	Risk / Impact	Description	Pre-Mit. Rating	Best Practice & EHSG Reference	Project-Specific Mitigation (A0302)	Responsibly parties	Timing
1	**ESMP/C-ESMP Approval and Permit Compliance**	Align Environmental and social planning with WB-ESF/ Mongolian law; commencement without required permits (quarries, temporary roads, water use, camp, waste disposal) risks regulatory non-compliance and project suspension.	**Substantial**	• **ESS1:** Conduct environmental and social assessment proportionate to risks; ESMP is required instrument for Substantial Risk projects; C-ESMP must be prepared and approved before civil works commence • **ESS3:** Obtain all required resource extraction and waste disposal permits before operations begin; quarry extraction permits, water use permits, and waste disposal permits must be in place	• Prepare C-ESMP consistent with P-ESMP and obtain CSC approval prior to Commencement Notice • Obtain all quarry permits (4 soil, 4 rock) before extraction; confirm permit validity and renewal mechanism • Obtain water abstraction permit from Orkhon River Basin Authority prior to any abstraction; • temporary road permits from Taragt and Khairkhandulaan soum governors • Obtain camp establishment, waste disposal, and hazardous waste handling approvals from Uvurkhangai Province Environmental Department before mobilisation • Verify land use conflicts with mining licenses, utilities and other infrastructure prior to site establishment and resopve through written clearance/consent • Submit annual domestic EMP (БОМТ) prior to each construction season	**Contractor**: Prepares C-ESMP and obtains permits CSC: Verifies all permits prior to issuing Commencement Notice IPIU / Employer: Confirms C-ESMP meets P-ESMP requirements; reports readiness to WB	Before any physical works and prior to each relevant activity.
2	**Information Disclosure, Stakeholder Engagement, and GRM Not Operational**	Inadequate pre-construction disclosure and consultation, particularly with herder	**Substantial**	• **ESS10:** Engage stakeholders throughout project life cycle from as early as possible; provide timely, relevant, understandable	• Conduct pre-construction consultations in Taragt and Khairkhandulaan soums (minimum 20 participants each; including women-focused session)	Contractor (CLO; Social Specialist): Implements consultations and GRM; installs	Before any works commence; ongoing throughout

		households, roadside traders, and tourism operators, results in failure to identify all sensitive receptors, loss of social licence, and a GRM not operational before works commence.		information free of coercion and discrimination •**ESS10:** Disclose: project purpose and scale; duration and location of activities; risks and impacts and mitigation; engagement process; and GRM before construction commences •**ESS10, GRM:** Project-level GRM must be operational before works commence; accessible to all affected parties including women; anonymous submissions accepted; timely response guaranteed •**ESS10:** Separate confidential channel for GBV/SEA/SH complaints; managed by female focal point; not combined with general GRM	• Conduct targeted consultations with herders, roadside traders, transport operators, and tourism business within 1 km of alignment of the RoW. • Provide advance notice ≥14 days prior to road closures; quarry activation, and camp establishment • Issue dedicated notice and consult tourism operators for works near the Great Horse Shrine and during the Naadam period (July); coordinate schedule with soum governors • GRM operational (hotline, drop-boxes at soum offices, bilingual site boards) before any worker arrives on site; GBV/SEA confidential channel established with female focal point • Disclose consultation records in Mongolian on MRT website within 7 days of each event; post signed attendance lists	GRM infrastructure; forwards complaints to IPIU within 24 hours CSC: verifies GRM operational and consultations complete before issuing Commencement Notice (Sub-Cl.8.1) IPIU / Employer: leads disclosure and grievances registry; reports to WB;	
3	**Traffic Management and Temporary Road Planning**	Inadequate Traffic Management Plan (TMP) for the A0302, an important tourism and livestock corridor, risks accidents, livestock collisions, disruption to Great Horse Shrine tourism,	**High**	•**EHSG 3.4 Traffic Safety:** Road safety initiatives proportional to project scope; flag persons and road signs at dangerous conditions; collaboration with local communities and authorities; coordination with emergency responders; use of speed control measures •**ESS4:** Prepare and implement TMP before any carriageway works; TMP must address road	• Prepare TMP in consultation with Traffic Police of Uvurkhangai Province; submit to CSC for review before any lane closure or temporary road opened • Speed limit 30 km/h in all active construction zones; deploy certified flagmen; advance warning signs at 500 m, 200 m, and 50 m from works • Temporary roads: compacted and stable; maximum lateral gradient 4%; reflective markers	Contractor (Traffic Controllers; EHS Officer; Site Manager) CSC: approves TMP; weekly traffic safety inspection; conditions payment on TMP compliance	TMP before any carriageway works; updated before works advance to each new section

		and Naadam period congestion. The road carries increasing traffic during July–September peak.		users, pedestrians, livestock, and emergency vehicle access; coordinate with Traffic Police • **EHSG 2.3 Physical hazards:** Train and license all vehicle operators; establish site speed limits; restrict vehicles to defined routes; audible back-up alarms on all equipment	every 50 m; watered twice daily for dust suppression • During Naadam (July) and peak tourism season: maintain access to the Great Horse Shrine at all times; consult with soum authorities and tourism operators; designate safe trade and service locations near the Shrine • Issue advance public notice nationally (via social media, soum, bag channels) at least >14 days before any road closure on this nationally significant tourism route • Emergency vehicle access maintained at all times; minimum one access point per 15 km of works	IPIU / Employer: coordinates with Traffic Police and tourism authority; reports traffic incidents to WB	
4	**Inadequate Road Design: Livestock/Wildlife Crossings and Community Access Ramps Not Specified**	The engineering design for the A0302 rehabilitation does not explicitly identify or specify livestock and wildlife crossing structures, nor community access ramps for herder households, cadastral plot holders, and winter/spring camp users.	**Substantial**	• ESS6: Biodiversity-friendly crossing structures must be incorporated into project design before works commence; MNS 6515:2015 specifies minimum dimensions and spacing in steppe zones; post-construction monitoring of crossing effectiveness required • ESS4: Design must account for pedestrian, livestock, and emergency vehicle access; design gaps creating community safety hazards must be corrected at design stage • ESS5: Where rehabilitation permanently alters access to land, water, or livelihoods,	• Before design is finalized, IPIU commissions a pre-design crossing and access survey with bag governors and affected herder households: GPS-map all seasonal livestock corridors, community access tracks, cadastral and camp plot access points, and identified wildlife movement corridors across the alignment • The pre-design survey shall also identify natural habitat, modified habitat, and potential critical habitat areas in accordance with ESS6, including known or likely habitat for Red Book species and important wildlife movement corridors associated with quarry areas,	Contractor: Ensures crossings and access points are duly reflected in the design. CSC: Reviews and approves crossing and ramp specifications before Commencement Notice for each section; certifies compliance with MNS 6515:2015 and ESS4/ESS6	Pre-design survey before contract documents finalized; crossing and ramp specifications in tender documents before contract award; CSC design approval before Commencement Notice per section

				design must restore equivalent access; ramp and crossing provision is a design obligation •EHSG 3.4 Traffic Safety: Collaborate with communities and authorities on safety near areas of frequent livestock movement; safe access provisions must be engineered into the road •MNS 6515:2015: Mandates crossing structures on roads traversing steppe; minimum clear width 3.5 m, height 2.0 m; spacing ≤3–5 km in steppe zones	temporary roads, and ancillary facilities. • Survey findings incorporated into design; crossings and ramps specified to MNS 6515:2015 minimums; community access ramp approach gradient ≤10%, carriageway crossing width ≥5 m, delineated with markers and warning signs • Design reviewed and approved by CSC before Commencement Notice; any crossing or ramp deficiency is a pre-commencement non-conformity; Great Horse Shrine access junction designed with adequate sight distances before contract award • One design consultation meeting with affected herder households before crossing locations are finalized; attendance recorded; any community-identified crossing need assessed and incorporated or formally documented if not feasible	IPIU / Employer: Commissions and leads pre-design survey; ensures findings in contract documents before tender; consults Uvurkhangai Province environmental and agricultural authorities; reports crossing design compliance to WB before design approval	
PHASE 2 - CONSTRUCTION							
1	**Dust, Air Quality, and PM Emissions**	Earthworks, topsoil stripping, quarry extraction (1.67M m³+), transport by 40+ dump trucks, and compaction generate substantial fugitive dust. The steppe	**Substantial**	•**EHSG 1.1 Air Emissions and Ambient Air Quality:** Control fugitive dust through water suppression (minimum 2 L/m²); cover truck beds during transport of loose materials; PM10 at site boundary ≤150 µg/m³ (24h average); monthly	• Water trucks (7 units) assigned for dust suppression on all construction sections, temporary roads, and quarry access tracks; minimum 2 L/m² twice daily; frequency increased in dry/windy conditions • All construction vehicles confined to designated routes only per TMP; off-route	Contractor (Environmental Specialist; EHS Officer; water truck drivers): dust suppression operations; monitoring	Daily during earthworks and transport; monthly laboratory monitoring throughout

		terrain and prevailing winds (spring/autumn dust storms) amplify impacts on herder households, livestock, and road users.		monitoring by accredited laboratory • **EHSG 1.1 Air Emissions and Ambient Air Quality:** Suspend earthworks when wind speed exceeds 10 m/s (dust storm risk); restrict vehicle movements to designated routes; store materials in enclosed areas where possible; all vehicles meet minimum Euro III emission standard • **ESS4:** Assess and manage community exposure to construction dust; advance notification ≥72 hours before particularly dusty operations near households; GRM channel for health complaints; site nurse response within 24 hours	movement triggers corrective action within 24 hours • Earthworks suspended when wind speed exceeds 10 m/s; weather monitoring log maintained by EHS Officer • Site Environmental Specialist equipped with PM2.5/PM10 monitoring equipment (CHD-11 or equivalent); monthly laboratory monitoring at 3 representative receptor locations • Community health complaint procedure: if PM10 complaint received through GRM, site nurse visits household within 24 hours; medical referral arranged if needed; temporary dust shield/relocation considered if trigger level (120 µg/m³) exceeded	CSC: weekly dust inspection; reviews PM monitoring reports; triggers corrective action IPIU/Employer: reviews monthly air quality reports; reports exceedances to WB	
2	**Noise, Vibration, and Night Works**	Construction machinery (excavators, rollers, asphalt pavers), blasting, and vehicle movements generate noise 70–90 dB(A). Proximity to herder households requires careful scheduling. Night works may	**Moderate**	• **EHSG 1.7 Noise:** Maximum allowable noise at nearest receptor: ≤55 dB(A) daytime (07:00–22:00); ≤45 dB(A) nighttime; measurements at receptor, not at source; noise meter with temperature, humidity, wind speed capability required • **EHSG 2.3 Physical hazards:** No worker exposed to >85 dB(A) for >8 hours without	• High-noise operations (crushers, asphalt plants, blasting) restricted to 08:00–19:00; concrete batching plants fenced to reduce noise propagation • If night works unavoidable: notify nearest households in writing ≥48 hours in advance; additional retroreflective signage; portable lighting; traffic flagmen • Provide hearing protection (earplugs or earmuffs) to all workers in high-noise areas; noise zone maps posted at	Contractor (EHS Officer; Environmental Specialist) CSC: reviews noise log monthly; verifies night works notification; triggers corrective action	Throughout construction; night works notification ad hoc

		be needed but require advance notification.		hearing protection; hearing protection enforced above 85 dB(A); periodic medical hearing checks for exposed workers •**EHSG 2.3 Physical hazards:** Whole-body vibration limits per ACGIH action values; investigate damping measures before duration limits; vibration monitoring at nearest structure within 200 m of compaction works	site; hearing checks annually for workers in ≥85 dB(A) areas • Site Environmental Specialist equipped with noise meter; disclose work schedules and plans to nearby households; respond to GRM noise complaints within 24 hours • Vibration monitoring at nearest ger structure within 200 m of roller compaction or blasting; if >5 mm/s PPV, reduce roller energy or increase standoff distance	IPIU/Employer: reviews noise complaints in monthly GRM log	
3	**Soil Disturbance, Erosion, and Topsoil Loss**	Earthworks include 285,326 m³ excavation of unsuitable material, 91,174 m³ embankment construction, and quarry operations across 8 sites. Topsoil stripping without systematic storage and reuse leads to permanent loss of productive steppe grassland.	**Substantial**	•**ESS3 / EHSG 1.8 Contaminated Land:** Strip topsoil to 20–30 cm depth and store separately for reuse in restoration; implement earthworks in phased short-duration sections to minimise exposed area; confine machinery to designated routes •**ESS6:** Restore all temporarily disturbed land to pre-project condition or better; revegetation with native species; target ≥60% vegetation cover within 2 growing seasons; topsoil reuse mandatory •**EHSG 1.5 Hazardous Materials:** Establish designated storage areas with secondary containment for fuel and oil at all earthwork and quarry sites; spill trays	• Strip topsoil to 20–30 cm depth before any earthworks in each section; stockpile separately from subsoil; do not mix with construction spoil; protect stockpiles from erosion • Topsoil reused in restoration of quarries, temporary roads, and borrow areas after works; any surplus transferred to approved locations confirmed with soum land administration • Earthworks implemented in phased sections; machinery movements confined to designated routes; track expansion beyond designated limits triggers corrective action • All borrow pits, quarries, and temporary excavation areas shall be graded after use to ensure positive drainage and prevent stagnant water accumulation, thereby	Contractor (Environmental Specialist): topsoil management; designated routes; spill response CSC: verifies topsoil handling; inspects spill containment; monthly soil management review IPIU/Employer: confirms restoration plans meet ESS3/ESS6; reports to WB	Topsoil stripped before earthworks in each section; ongoing throughout

				and absorbent pads mandatory; contaminated soil remediated immediately	eliminating mosquito breeding habitats in steppe conditions • Designated fuel and oil storage areas with impermeable base and secondary containment (≥110% largest container volume); spill kit maintained on site; spills neutralised within 1 hour • Contaminated soil remediated and removed by licensed entity; replacement clean soil placed; soil quality monitoring at former storage areas before site closure		
4	**Water Resources Protection — Surface Water and Groundwater**	Uvurkhangai has seasonal surface streams and springs; groundwater wells provide drinking water for households and livestock. Fuel spills, construction runoff, camp wastewater, and excessive water abstraction (dust suppression + camp needs) risk water quality degradation.	**Moderate**	•**EHSG 3.1 Water Quality and Availability:** Drinking water sources must at all times be protected to meet or exceed national standards or WHO drinking water quality guidelines; groundwater abstraction must be assessed for seasonal variability and community demand •**EHSG 3.1 Water Availability:** Project activities must not compromise availability of water for personal or livestock needs; minimum 100 L/person/day water availability to be maintained in communities •**EHSG 2.1 General Faciliy Design and**	• Establish designated fuel and oil storage areas away from any surface water or spring (minimum 300 m buffer); no refuelling within 100 m of watercourse • Install portable eco-toilets and sealed wastewater holding tanks at camp and all active work sections; regularly pump and transport to licensed disposal facility; prohibit open discharge of wastewater • Water abstraction: obtain permit from Orkhon River Basin Authority before any abstraction; abstraction must not reduce community well levels below seasonal minimum; monthly groundwater level monitoring at nearest community wells during pumping	Contractor (Environmental Specialist; licensed sanitation provider) CSC: reviews water quality reports monthly; verifies well-level monitoring; triggers corrective action IPIU/Employer: confirms water permit in place; reports water quality exceedances to WB	Water permit before any abstraction; monthly monitoring throughout

				Operation: Adequate supplies of potable drinking water for all 197 workers; water for drinking and food preparation must meet WHO drinking water quality standards; tested monthly	• Avoid earthworks or spoil disposal during heavy rainfall; intercept and treat runoff from active sections before discharge to ditches or natural drainage • All temporary drainage structures and disturbed landforms shall be graded to ensure positive drainage and prevent stagnant water formation, thereby reducing mosquito breeding risk in borrow pits, quarries, and construction sites • Monthly water quality monitoring (surface water and groundwater) at 3 designated stations throughout construction; results reported to CSC and IPIU		
5	**Traffic Safety: Open Road During Construction**	The A0302 is a nationally significant Arvaikheer–Bayankhongor corridor with 2–3× traffic increase during the Naadam/tourism season (July–September). Construction on a live road, combined with heavy equipment and temporary diversions, creates High traffic safety risk	**High**	•**EHSG 3.4 Traffic Safety:** Adopt best transport safety practices across all aspects of project operations; speed control devices on trucks; flag persons and road signs at all dangerous conditions; coordinate with emergency responders; minimise pedestrian and livestock interaction with construction vehicles •**EHSG 2.3 Physical Hazards:** Training and licensing for all vehicle operators; medical surveillance for drivers; audible back-up alarms on all equipment; established speed limits;	• TMP approved by Traffic Police before any works on live road; updated before works advance to each new section; includes designated livestock and pedestrian crossing points per consultation with local residents • Speed limit 30 km/h in all active construction zones; speed limit compliance monitored weekly by EHS Officer; truck speed governors fitted on all heavy haulage vehicles • During Naadam period (July) and tourism peak: TMP section-specific provisions for the Great Horse Shrine approach; safe tourist	Contractor (Traffic Controllers; EHS Officer; Site Manager) CSC: reviews TMP; weekly traffic safety inspection; conditions payment on TMP compliance; coordinates with Traffic Police IPIU/Employer: coordinates with Traffic Police and tourism authority;	TMP before any carriageway works; daily monitoring throughout

		for road users, tourists, pedestrians, and herders.		vehicle inspection requirements •**EHSG 3.7 Emergency Preparedness and response:** Emergency Response Plan with communication systems; first aid at all work fronts; accident notification procedure; coordination with emergency services	access maintained 24 hours; advance national media notification of works • Night works: if unavoidable, retroreflective signage; temporary lighting; additional flagmen; notify households ≥48 hours in advance • Accident at construction zone: site shut down for investigation; notify CSC and Traffic Police within 1 hour; IPIU within 4 hours; WB within 24 hours for serious incidents • Coordinate with mining entities on the haulage and mining related traffic	reports incidents to WB	
6	**Livestock and Wildlife Safety: Vehicle Collisions and Pasture Access**	Livestock movement across A0302 is frequent (especially during seasonal migration); construction vehicles pose collision risk. 8 quarry sites and temporary roads may restrict herder access to pasture and water sources. Wildlife (deer, foxes, raptors) may be displaced by noise and vibration.	**Substantial**	•**EHSG 3.4 Traffic Safety:** Speed control near livestock crossing areas; collaboration with local communities to improve safety near areas of frequent livestock movement; flag persons at crossing points •**ESS6:** provide wildlife crossings; avoid unnecessary chemical use; high-noise works during daytime only; machinery with silencers preferred; protect and support wildlife movement and migration •**ESS5 14:** Temporary restriction of livestock access to pasture or water is a livelihood impact; compensate at	• Livestock crossing points identified in pre-construction consultation with herders and soum administrations; GPS-marked, 5 m minimum clear width, reflective posts at 200 m approaches; operational 24 hours and incorporated in TMP • Warning signage at livestock crossing approaches: speed limit 20 km/h; 'Livestock Crossing — Slow' in Mongolian • Prepare and implement a Biodiversity Management Plan (BMP) as part of the C-ESMP based on pre-construction ecological surveys and ESS6 habitat classification results; clearly define no-go areas, sensitive habitats, wildlife movement corridors, monitoring	Contractor (CLO; Environmental Specialist; Site Manager) CSC: reviews BMP; monthly livestock safety and GRM complaint check IPIU Social Specialist: maintains livestock incident register; monitors GRM; reports to WB	Crossing points identified before NTC; livestock safety managed throughout

				market value within 30 days; replacement water source provided within 24 hours before any access restriction •	requirements, and restoration obligations. • Livestock collision procedure: any collision reported to CLO within 4 hours; joint assessment with herder and contractor within 48 hours; market-value compensation within 30 days if project vehicle responsible • Pasture access restriction: announce ≥14 days in advance; provide alternative access route or compensation; legacy quarry and temporary road areas restored to pasture use after closure		
7	**Community Health and Safety: Dust, Noise, Vibration at Households and Tourism Sites**	Herder households and the Great Horse Shrine tourist site are sensitive receptors along the A0302. Dust, noise, and vibration from earthworks, blasting, and transport affect residential health, quality of life, and tourism income. Reduced visibility from dust poses road safety risk to tourist drivers.	**Substantial**	•**ESS4:** Assess and manage community exposure to construction-related dust, noise, and vibration; advance notification of particularly dusty or noisy activities; GRM response within 48 hours; priority attention to vulnerable groups •**EHSG 3.1 Water Quality:** Dust suppression water must not contaminate drinking water sources; maintain community water quality standards at all times •**EHSG 3.2 Structural Safety of project infrastructure:** Buffer separation required between project hazards and public areas; vibration monitoring near structures; physical	• Before works within 1 km of any ger or the Great Horse Shrine, CLO visits household/site manager, explains schedule, provides contact number, and records visit • Water truck assigned to dust suppression on roads between active construction and nearest ger (within 500 m of households); minimum 2 L/m² application • During Naadam and tourism peak (June–September): maintain access to the Great Horse Shrine 24 hours; designated safe tourist bypass route; consult with site manager on works schedule near the Shrine • Implement watering and noise reduction measures to protect tourist services;	Contractor (CLO; EHS Officer; site nurse) CSC: monthly health complaints review; triggers corrective action IPIU: monitors GRM for community health complaints; includes in monthly E&S report to WB	Ongoing throughout construction; CLO visits before works in each new km section

				exclusion zones at quarry blast sites	advance information through social media and local channels • GRM noise/dust complaint: site nurse visits household within 24 hours; medical referral if needed; if PM10 trigger exceeded, consider temporary windscreen/relocation		
8	**Impacts on Business Income: Roadside Traders, Tourism, and Seasonal Enterprises**	The A0302 is a primary tourism route to the Great Horse Shrine and Arvaikheer. Road closures and construction disrupt seasonal trade income (July–September peak), reduce Shrine visitor access, and affect Naadam-period transport. Roadside traders identified as key stakeholders.	**Moderate**	•**ESS5:** Temporary restrictions on livelihoods of businesses that depend on road access and tourism flows are involuntary resettlement impacts; consult, document, and mitigate; •**ESS10** Disclose works schedule to all affected businesses before construction; provide advance notification of road closures via appropriate channels for this nationally significant tourism corridor •**EHSG 3.4 Traffic Safety:** Where project may significantly affect traffic flows, collaborate with local communities to improve signage and overall road safety; use locally sourced services where possible to support local economy •	• Consult roadside traders and tourism operators separately before construction commences; record their peak seasons and key access requirements; incorporate into TMP and works schedule • During Naadam (July) and tourism peak (June–September): plan works to maintain maximum access to the Great Horse Shrine; designate safe visitor bypass; coordinate vehicle management to avoid tourist-construction conflicts • Advance notice of road closure or disruption: ≥14 days nationally through social media and local channels and ensure effective reach; place signage in both directions on the tourism route ≥3 km from works • Designate safe and convenient alternative locations for roadside trade near construction zones; do not block access to established trade points without consultation and alternative offer	Contractor (CLO; Social Specialist): consults traders; implements access provisions CSC: reviews business impact complaints in monthly GRM log IPIU: tracks business income complaints; assesses compensation eligibility; reports to WB	Consultation before construction; access provisions maintained throughout tourism season

					• Add dedicated business income impact category to GRM register; acknowledge and respond to business complaints within 7 working days; document mitigation actions; escalate unresolved claims to IPIU within 30 days		
9	**Labour Influx: Cultural Conflict, Resource Pressure, and Communicable Disease**	Up to 197 workers (with Chinese nationals in a rural community near Arvaikheer) create risks of cultural conflict, resource pressure, and communicable disease transmission in a community where tourism flows already bring external visitors. Camp management must be self-sufficient.	**Moderate**	• **EHSG 3.6 Diseases prevention:** Labour mobility increases STD and communicable disease risk; implement awareness and education initiatives; provide STD/HIV surveillance and screening; healthcare access for migrant workers; person-to-person counselling; condom distribution • **EHSG 3.6 Diseases prevention:** sanitary improvements; integrated vector control if needed • **ESS4:** Implement Code of Conduct prohibiting violence, harassment, and exploitation; camp self-sufficiency; controlled community interaction protocols; security personnel bound by same Code of Conduct	• Camp located ≥500 m from any settlement or water source; camp self-sufficient for food, water, sanitation, and recreation; workers not to source food or water from community without Camp Manager authorisation • Develop and implement a Camp management Plan with strict curfews and risky behavior restrictions • Cultural sensitivity induction for all workers: Mongolian customs, sacred sites (ovoo, Great Horse Shrine), ger etiquette, livestock status; delivered in Chinese with Mongolian interpreter; signed acknowledgement, • Code of Conduct, prohibited behaviors • Job vacancies posted at Taragt and Khairkhandulaan soum offices and local social media ≥30 days before works; minimum 30% local workers; on-site skills training for local hires • Engage local suppliers and service providers where feasible (food supply, laundry, transport); contribute to local economic multiplier	Contractor (HR Manager; Camp Manager; CLO) CSC: monthly unannounced camp inspections; reviews community interaction log IPIU Social Specialist: reviews monthly social risk report; responds to escalated concerns	Camp rules from Day 1; training before any worker on site; ongoing

					• Monthly unannounced camp inspection by CSC; community interaction log maintained by Camp Manager; random inspections by IPIU quarterly		
10	**GBV / Sexual Exploitation and Abuse / Sexual Harassment (SEA/SH)**	Predominantly male migrant workforce in a community along a tourism corridor, where women and girls may be present as traders and visitors, and where community safety data shows above-average crime in some soums, requires a robust GBV/SEA/SH prevention and response system.	**Moderate**	• **EHSG 3.6 Diseases prevention:** Recognizing no single measure is effective, combine behavioral and environmental modifications; STD/HIV information, person-to-person counselling, and condom distribution; confidential access to healthcare • **ESS4:** Code of Conduct for all project personnel must explicitly prohibit violence, harassment, and exploitation; zero-tolerance enforced through termination and law enforcement referral • **WB GBV Good Practice Note (2018):** Female GBV focal point; separate confidential channel; no cross-reporting to general GRM; survivor-centred response; referral pathway to external support services •	• Female GBV Focal Point appointed before any worker arrives on site; name and contact posted at camp and soum offices in Mongolian • Separate anonymous reporting channel (drop-box and dedicated phone number accessible to community women and tourists); not combined with general GRM • GBV/SEA/SH worker induction: definitions, prohibited behaviours, reporting pathways; delivered in Chinese and Mongolian; signed acknowledgement required • Quarterly anonymous surveys of female community members via soum social worker; results reported to IPIU; trends addressed in monthly E&S report • Any GBV incident: reported to IPIU within 24 hours; IPIU reports to WB within 48 hours; survivor-centred approach; medical, psychological, and legal support facilitated within 24 hours	Contractor (GBV Focal Point; HR Manager) CSC: verifies GBV channel operational; reviews quarterly survey results IPIU (Social/GBV Specialist): manages GBV response; reports to WB	Before mobilisation; quarterly training; channel operational throughout
11	**Occupational Health and Safety (OHS)**	Workers face hazards from: heavy machinery (excavators, rollers, pavers);	**Substantial**	• **EHSG 2.0 OHS:** Preventive priority order: (1) eliminate hazard; (2) engineering controls; (3) administrative controls; (4) PPE; apply based on	• OHS Plan (aligned with EHSG §2.0–2.9) approved by CSC before Commencement Notice; updated for each new major work type (blasting, paving, culvert installation)	Contractor (HSE Manager; HSE Officer; Medical Staff)	OHS Plan before any works; pre-employment medical before mobilisation; daily monitoring

		hot bitumen (burns, fume inhalation); blasting operations; extreme temperatures (−30°C winter, +35°C summer); traffic interaction at live road; confined space entry in culverts; work at height on embankment slopes.		job hazard analyses; use risk ranking matrix (Table 2.1.1) for action priorities • **EHSG 2.1 First Aid:** Qualified first-aider at all times; first-aid stations easily accessible; remote site written emergency procedures; eye-wash stations at chemical handling areas • **EHSG 2.3 Physical Hazards:** Monitor weather for outdoor work; adjust work/rest periods per ACGIH temperature stress procedures; temporary shelters within 500 m of all work fronts; adequate hydration; no hot bitumen works below −15°C • **EHSG 2.7 PPE / EHSG 2.8 Special Hazard Environments:** Permit-to-work for confined space entry (culverts), work within 2 m of live traffic, night works, hot bitumen, blasting; full PPE mandatory	• OHS induction for all 197 workers before first day on site: hazard awareness, site-specific risks, emergency procedures, PPE use; delivered in Chinese and Mongolian • PPE and hazardous work procedure induction including: helmets, gloves, protective clothing, boots, masks/respirators, hearing protection for high-noise areas • Permit-to-work system for: confined space entry in culverts; work within 2 m of live traffic; night works; hot bitumen handling; all blasting operations • All safety-critical signage bilingual (Mongolian and Chinese) using ISO pictograms; daily toolbox talks delivered by bilingual supervisor or with interpreter; emergency stop-work signals standardised in both languages at induction • Extreme cold: work suspended if temperature < −25°C without wind; heated rest shelter within 500 m of all work fronts; no hot bitumen works below −15°C • All incidents and near-misses reported within 24 hours; root-cause investigation and corrective action; fatality or serious incident: IPIU and WB notified within 24 hours	CSC (Safety Inspector): weekly OHS inspection; reviews incident log; verifies permit-to-work IPIU: periodic OHS audits; reviews incident reports; enforces contractual obligations	

12	**Labour and Working Conditions: Wages, Hours, Accommodation**	197 workers including Chinese nationals must be covered by compliant employment contracts under Mongolian Labour Law and ILO Core Labour Standards. Camp accommodation (food, water, sanitation) must meet minimum standards. Worker GRM must be accessible in all working languages.	**Moderate**	• **ESS2:** Written employment contracts; wages paid timely; working hours comply with national law; overtime voluntary and compensated; no child labour (<18 on hazardous work); forced labour prohibited • **EHSG 2.1 General Facility Design and Operation:** Adequate sanitation for number of workers; segregated toilet facilities; potable water tested monthly; clean eating area; minimum 4 m² per worker; heating for cold climate; emergency lighting • **ESS2 Worker GRM:** Worker GRM accessible in all working languages; complaint acknowledged within 2 working days; resolved within 14 working days; no retaliation for good-faith complaints; Worker GRM separate from community GRM	• Mongolian workers: minimum wage per Mongolian Labour Law; no deductions without written consent; paid monthly to personal bank account • Chinese workers: wage terms consistent with ILO Core Labour Standards; maximum 60 hours/week; overtime voluntary, documented, and paid at premium rate • No workers under 18 years on any part of this contract; pre-employment age verification required; records submitted to IPIU • Adequate camp management plan with provisions on sanitation, safety, waste management etc. • Camp: minimum 4 m² per worker; potable water tested monthly to WHO standards; segregated toilet and shower facilities; daily waste collection; heated accommodation for cold months • Worker GRM: hotline and drop-box at camp in Mongolian and Chinese; acknowledged within 2 working days; resolved within 14 working days; quarterly payroll spot-check by CSC	Contractor (HR Manager; Camp Manager) CSC: quarterly payroll spot-check; audits camp conditions; verifies Worker GRM operational IPIU: spot inspections; addresses systemic issues; reports to WB	Before mobilisation (camp ready); throughout construction
13	**Vegetation, Fauna, birds and Ecosystem Disturbance**	Earthworks, quarry expansion, and temporary road establishment disturb the Khangai steppe-	**Moderate**	• **ESS6:** Clearly define worksite boundaries; avoid unnecessary disturbance of vegetated areas; if rare or protected species encountered, transplant under	• Clearly mark and fence all worksite boundaries before earthworks; spot-check by Environmental Specialist weekly for boundary compliance	Contractor (Environmental Specialist) CSC: monitors worksite	Throughout construction; rehabilitation concurrent and post-works

		forest transition zone vegetation. The alignment traverses areas with potential rare or protected plant species and provides habitat for steppe fauna (raptors, foxes, gazelle, small mammals).		specialist supervision before works commence; provide worker environmental awareness training • **ESS6 / EHSG 1.8 Contaminated Land:** Restore all temporarily disturbed areas with native species; topsoil reuse mandatory; target ≥60% vegetation cover within 2 growing seasons; rehabilitation monitored biannually • **EHSG 2.3 Physical Hazards:** High-noise operations during daytime only; use machinery with silencers; avoid unnecessary chemical use near natural habitats; speed limits in sensitive areas	• If any rare or protected plant species encountered: halt works in that area; notify IPIU within 24 hours; transplant under specialist institution direction before resuming • Worker environmental awareness training: key vegetation types present; no cutting, uprooting, or collection of any plant outside designated work area; signed acknowledgement • Wildlife-friendly measures: machinery with silencers where possible; high-noise works 08:00–19:00 only; speed limit 20 km/h in areas of identified wildlife concentration • Post-works rehabilitation: topsoil respread; native grass seeding (Stipa krylovii, Agropyron cristatum, Stipa gobica, etc.) biannual monitoring for 2 growing seasons; photographic records submitted to IPIU with each monitoring report	boundary compliance; reviews rehabilitation reports IPIU: confirms rehabilitation meets ESS6; reports to WB	
14	**Physical Cultural Heritage: Chance Finds and Great Horse Shrine**	The Great Horse Shrine of the Mongol People is located alongside the A0302 and is a significant cultural heritage site attracting domestic and foreign tourists. Historical and cultural heritage	**Moderate**	• **ESS8:** Where project activities could affect cultural heritage: implement Chance Finds Procedure (CFP); stop work immediately if heritage encountered; notify competent authorities within 24 hours; do not resume until written clearance received from qualified professional and authorities	• Cultural heritage protection plan prepared as part of C-ESMP; integrated construction traffic arrangements, dust control, and noise management for the Great Horse Shrine approach • Install dedicated warning signs and speed calming measures at the Great Horse Shrine; maintain visual and	Contractor (Environmental Specialist; all site staff) CSC: confirms CFP in place; coordinates with Culture Department; conditions resumption on written clearance	Heritage plan before any earthworks; CFP ongoing throughout

		sites are numerous in Taragt and Khairkhandulaan soums. Earthworks and blasting may uncover unrecorded heritage features.		• **ESS8:** Consult affected communities and local heritage authorities during project preparation on cultural heritage risks; integrate heritage protection requirements into construction management • **EHSG 3.2 Structural Safety of Project Infrastructure:** Physical exclusion zones function as structural protective buffers; cultural heritage sites require physical delineation and protective signage around works •	physical access to the Shrine throughout construction • Chance find procedure (CFP) provided to all workers in Mongolian and Chinese at induction; heritage awareness module (1 hour): what to look for in this area, reporting pathway, stop-work obligation; signed acknowledgement • GIS layer of known heritage sites maintained by Environmental Specialist; updated if new features identified during works; shared with CSC and Uvurkhangai Province Culture Department • Chance find: stop work immediately; delineate and secure area; notify Engineer within 4 hours and Uvurkhangai Province Culture Department within 24 hours; do not resume until written clearance received	IPIU: notifies Ministry of Culture of any finds within 24 hours; reports to WB	
15	**Fire Risk and Emergency Preparedness**	Fuel storage (bowser tanker + static tanks at camp), bitumen operations, laboratory chemicals, and electrical equipment create fire and explosion risk in a remote steppe environment where fire services are far	**Moderate**	• **EHSG 3.3 Life and Fire Safety:** Fire prevention plan for all fuel storage and hot-work areas; fire detection, alarm, and suppression equipment; fire extinguishers at all high-risk areas; evacuation drills annually; emergency lighting; trained fire response personnel • **EHSG 3.7 Emergency Preparedness:** Emergency Response Plan covering:	• Professional licensed entity conducts disaster risk assessment for fuel storage operations before first construction year; results incorporated in Emergency Response Plan • Emergency Response Plan (ERP) prepared before Commencement Notice; includes: communication tree; evacuation plan; fire response procedure; medical evacuation to nearest hospital; flood response	Contractor (HSE Manager; licensed disaster risk assessment entity) CSC: reviews ERP; verifies fire equipment in place; responds to incidents IPIU: reviews ERP; reports incidents to WB	ERP before Commencement Notice; fire training before relevant task commences

		from site. Worker and community member injuries related with the works require local emergency response, reducing access of communities		communication systems; emergency resources (pumps, sandbags, dewatering equipment for flood events); coordination with fire and emergency services; medical evacuation procedure • **EHSG 2.1 General Facility Design and Operation:** Fire detectors, alarm systems, and firefighting equipment maintained in good working order; adequate for dimensions and maximum number of persons present; manual firefighting equipment easily accessible	(sandbags, pumps); updated annually • Fire safety training for all fuel handlers and bitumen workers before commencing those tasks; fire extinguisher and first-aid refresher annually • During heavy rainfall: stop earthworks; ensure all drainage channels and culverts remain unobstructed; monitor weather forecasts; keep sandbags, temporary dikes, and dewatering pumps ready • Spilled fuel neutralised and contaminated soil removed within 1 hour; incident reported to CSC within 4 hours; IPIU within 24 hours		
PHASE 3 — POST-CONSTRUCTION AND OPERATIONAL							
1	**Ecosystem Services Disruption (Grazing productivity, water catchment, landscape services)**	Road rehabilitation, quarries, borrow pits, and haul roads may fragment steppe ecosystem functions beyond direct land access impacts. Potential indirect effects include reduced pasture productivity from dust deposition, altered drainage affecting water availability for livestock, and	**Moderate**	• ESS6: Maintain ecosystem service functions supporting local livelihoods, including regulating (water, soil retention) and provisioning (pasture productivity) services	• ESS5: Ensure livelihood restoration includes ecosystem service dependency, not only physical access • ESMF requirement: No net loss of access to ecosystem services supporting pastoralism • Include dust deposition impact on vegetation productivity in environmental monitoring (proxy: vegetation cover + biomass sampling at representative sites) • Ensure drainage design maintains natural runoff patterns to springs and seasonal streams used for livestock	Contractor (Environmental Specialist) CSC: reviews ecosystem baseline and monitoring outputs IPIU: integrates ecosystem service indicators into annual E&S report to WB	Baseline pre-construction; monitoring for 3 years post-completion

		localized degradation of ecosystem services relied upon by herder households.					
2	**Site Rehabilitation and Restoration: Quarries, Temporary Roads, Camp**	8 quarry sites, temporary roads, borrow areas, and the camp must be fully restored. Inadequate rehabilitation leaves permanent land degradation, safety hazards (open pits), and herder livelihood impacts through loss of pasture. Restoration to ≥60% vegetation cover is required by 2030.	**Substantial**	• **ESS5:** Restore livelihoods and land to pre-project conditions or better; involve affected herder households in verification of restoration; performance monitoring against agreed standards; herder acceptance required before project closure • **ESS3 / EHSG 1.8 Contaminated Land:** All disturbed sites assessed and restored; hazardous materials remediated before handover; post-closure groundwater monitoring at former hazardous material storage areas; contaminated soil removed by licensed entity • **ESS6:** Rehabilitate areas with native species; topsoil reuse mandatory; target ≥60% vegetation cover within 2 growing seasons; rehabilitation monitored biannually; results reported as project benefit indicator	• All 8 quarry and borrow sites: backfill voids with construction-generated material; shape slopes ≤30°; re-spread stored topsoil (minimum 20 cm depth); seed with native grass mix; drainage channels reinstated • Temporary roads: scarify compacted surfaces; respread topsoil; native grass seeding; drainage restored; no residual signage or infrastructure left on site • Camp: full decommissioning and clean-up; all portable facilities, containers, and waste removed; contaminated soil identified and remediated; site restored to grassland • Verify vegetation cover ≥60% by spring 2028; biannual monitoring by Environmental Specialist; photographic documentation submitted to IPIU; results compared against pre-project baseline • Joint post-restoration site inspection with affected herder households before Performance Certificate issued; signed herder acceptance document for each TLUA site (Sub-Cl.11.9)	Contractor: implements full restoration before demobilisation; provides herder acceptance documents CSC: certifies quarry, temporary road, and camp restoration; conditions Performance Certificate on all closures IPIU: verifies herder acceptance; monitors vegetation recovery biannually for 2 years; reports to WB	Concurrent with construction (progressive closure); all restoration complete before demobilisation; certified before Performance Certificate
3	**Road Traffic Safety:**	Improved road conditions and	**High**	• **EHSG 3.4 Traffic Safety:** Road Safety	• Road Safety Audit (RSA) commissioned by IPIU before	Contractor: remedies defects	RSA before Taking-Over; first

	Operational Phase	increased speeds on the A0302 post-rehabilitation create new traffic safety risks: livestock crossings need maintained signage; the Great Horse Shrine requires dedicated speed management; Naadam traffic peaks need enforcement. Without Road Safety Audit before handover, deficiencies persist into operation.		Audit required before Taking-Over; post-project monitoring of road safety outcomes for minimum 3 years; maintain accident recording; implement black-spot improvements; collaborate with communities on safety near schools, tourist areas, and livestock crossings • **ESS4:** Install speed calming measures at settlements, livestock crossings, and tourist sites; establish speed limits and coordinate enforcement with Traffic Police; maintain accident records • **EHSG 3.2 Structural Safety:** Drainage and embankment structures must be maintained to prevent structural failure; inspection schedule for culverts and slope protection	Taking-Over Certificate; identified deficiencies remediated before handover • Install dedicated warning signs, speed reduction measures, and safe visitor access arrangements at the Great Horse Shrine before road opens to traffic • Provide agreed livestock crossing access points and pedestrian crossings with warning signs and physical delineation at all locations identified in pre-construction consultation • Road Maintenance Centre (RMC) briefed on livestock crossing locations, heritage site proximity, and community sensitive receptor locations before handover; GPS asset data transferred to MRT RAMS database • Semi-annual road safety inspections for first 2 operational years; annual accident statistics from Traffic Police reported to IPIU as monitoring indicator; target ≥50% reduction in fatalities within 3 years	during DNP; provides as-built documentation including heritage protection features CSC: RSA before handover; issues Taking-Over and Performance Certificates after DNP IPIU: coordinates handover to MRT/RMC; reports road safety data to WB annually for 3 years	3 years of operation
4	**Drainage System Maintenance and Road Deterioration**	The A0302 deteriorated rapidly after original construction due to lack of maintenance and drainage malfunction. Without a formal	**Substantial**	• **EHSG 3.4 Traffic Safety:** Regular maintenance required to sustain traffic safety outcomes; deteriorating road surface is a direct traffic safety risk; maintenance plan and budget must be confirmed before handover	• As condition of project completion: MRT confirms in writing (i) State Commission acceptance for rehabilitated road; (ii) annual maintenance budget line in MRT budget confirmed • RMC develops 5-year maintenance plan for A0302 KM14+800–50+620 section	Contractor: DNP obligations (Sub-Cl.11.1); maintains drainage during construction and DNP	Maintenance plan before Taking-Over; ongoing for 3 years post-completion

		maintenance agreement and confirmed RMC budget, the rehabilitated road risks reverting within 5–10 years. Drainage blockage causes pavement weakening and slope failure.		• **EHSG 3.2 Structural Safety:** Drainage and culvert structures require inspection and maintenance schedule; blockage causes pavement weakening, shoulder collapse, and flood damage; regular cleaning mandated • **ESS4:** Communities must not be exposed to hazards from deteriorating project infrastructure; project sponsor responsible for ensuring maintenance arrangements are in place before project closure	before handover; includes seasonal drainage inspection and cleaning schedule • Contractor DNP: minimum 365 days after Taking-Over Certificate; all defects repaired within 30 days of notification • IPIU commissions annual road condition survey for first 3 years post-completion (including drainage system inspection); results reported to WB • Drainage structures: annual inspection by RMC; cleaning of all roadside ditches and culverts before onset of wet season; results reported to MRT	CSC: annual condition survey for 3 years post-Taking-Over; issues Performance Certificate after DNP IPIU: secures MRT maintenance commitment before completion; monitors and reports to WB	
5	**Post-Construction GRM, Restoration Disputes, and Livelihood Verification**	After construction ends, herders may raise outstanding land restoration disputes, unresolved livestock compensation claims, or concerns about access to pasture and water points. GRM must remain operational post-completion; vegetation recovery monitoring must	**Moderate**	• **ESS10:** GRM must remain operational after project completion for a minimum period; post-construction complaints must be documented and resolved; affected parties must be notified of restoration completion • **ESS5:** Post-construction livelihood restoration verification required; confirm ≥60% vegetation cover recovery on quarries and temporary areas by spring 2028; access to water points restored • **ESS6:** Monitor vegetation recovery on closed temporary roads and quarries biannually	• Keep GRM operational for 24 months post-completion through soum administration offices; resolve post-construction complaints within 30 days (target: ≥90% closure rate) • Conduct road user satisfaction survey within 6 months of road opening; herder household livelihood survey by spring 2028 to verify pasture access recovery • Verify vegetation cover ≥60% at all quarry and temporary road sites by spring 2028; biannual photographic monitoring; results included in IPIU annual E&S report to WB • Confirm full restoration of access to community water points and livestock watering areas before Performance	Contractor: remedies outstanding defects and disputes during DNP; provides herder acceptance documentation CSC: verifies restoration and GRM before Performance Certificate IPIU: monitors post-construction GRM; reports to WB; commissions	GRM: 24 months post-completion; vegetation monitoring biannually for 2 years

		confirm restoration.		for 2 years; results reported as project benefit indicator in E&S reports to WB	Certificate issued; soum governor sign-off required • Where compensation has been provided (livestock claims, business income, temporary land use): formally close cases per applicable procedures; confirm herder acceptance in writing	satisfaction survey	
6	**Livestock/Wildlife Crossing and Community Access Ramp Adequacy Verification**	Planned and constructed crossings and community access ramps may not function as intended for both livestock and wildlife movement. Poor design usability or low wildlife utilisation could reduce habitat connectivity and increase collision risk.	**Substantial**	• **E**SS6: Post-construction monitoring of wildlife crossing effectiveness required; results documented and reported as project benefit or residual impact indicator; corrective measures implemented if crossings not functional • ESS4: Road Safety Audit before Taking-Over must assess livestock crossing safety and community access ramp adequacy as specific audit items; RSA deficiencies remediated before handover • ESS5: Post-project monitoring must confirm access to land, water, and resources restored to pre-project levels; herder households participate in verification; acceptance documentation required • EHSG 3.4 Traffic Safety: Post-project road safety monitoring includes accident recording at crossing locations; black-spot improvements	• Within 30 days of road reopening, conducts a walking inspection of every crossing and ramp: dimensions checked against MNS 6515:2015, invert condition, approach gradient, signage, and whether the structure is practically usable by herder vehicles and livestock; findings recorded in a Crossing and Ramp Adequacy Register • Each affected herder household provides a written statement on whether their crossing or ramp meets their access need; any structure assessed as inadequate (technically or practically) is treated as a DNP defect and remediated by the Contractor within 30 days • Six-month community survey with all affected herder households on access restoration by IPIU; results submitted to WB in the post-construction E&S monitoring report • Crossing and ramp GPS coordinates, dimensions, and photographic baseline transferred to MRT RAMS database at handover; RMC annual maintenance schedule includes crossing inspection	Jointly conducts post-opening walking inspection; remediates all crossing and ramp deficiencies within DNP; installs camera traps at wildlife monitoring points CSC: validates monitoring design + triggers corrective action IPIU: compiles ecological performance indicators and reports to WB	3 years post-completion monitoring; first adaptive review at 12 months

				where livestock-vehicle collision risk identified	and sediment clearance before wet season • Post-construction biodiversity monitoring shall verify effectiveness of wildlife crossings and confirm whether habitat connectivity has been maintained in identified natural and critical habitat areas. Monitoring methods may include field surveys, camera traps, and consultation with local herders and environmental authorities.		

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5.4. ESMP implementation budget

Note: *This budget estimate was calculated at 2026 prices. It should be noted that economic conditions, inflation, and the cost of activities implemented under operational expenditure may increase over time.*

Cat	ESMP Component	Key Activities / Description	2025–2026	2027	Total	Funding Source
A	E&S Staffing	HSE Manager, Environmental & Social Specialists, CLO, Supervision E&S staff	109,900	85,900	195,800	Contractor + Supervision +
B	Occupational Health & Safety	PPE, medical checks, OHS equipment, emergency response, disaster risk assessment	49,470	9,480	58,950	Contractor BOQ
C	Training & Capacity Building	OHS induction, GBV/SEA/SH training, toolbox talks, cultural awareness	19,800	5,800	25,600	Contractor BOQ
D	Environmental Monitoring	Air, noise, water, soil, vegetation, wildlife; incl. post-construction monitoring	11,380	12,560	23,940	Contractor BOQ
E	Social Monitoring, SEP & GRM	Consultations, surveys, GRM operation, SEA/SH reporting channels	17,000	9,450	26,450	Contractor BOQ
F	Dust Suppression	Water truck operations, water permits	47,750	20,475	68,225	Contractor BOQ
G	Waste Management	Waste bins, disposal, hazardous waste handling, sanitation facilities	7,700	2,700	10,400	Contractor BOQ
H	Camp Management	Sanitation, water supply, food safety, security, heating, decommissioning	15,600	12,800	28,400	Contractor BOQ
I	Traffic Management	TMP, signage, flagmen, road safety audit, community safety measures	32,200	8,900	41,100	Contractor BOQ
J	Site Rehabilitation	Quarry restoration, revegetation (~73 ha), soil remediation, monitoring	125,400	86,200	211,600	Contractor BOQ
K	Cultural Heritage	Chance finds, protection plan, coordination with authorities	2,100	2,100	4,200	Contractor BOQ

CHAPTER 6. PROJECT ESMP IMPLEMENTATION ARRANGEMENTS, ROLES AND RESPONSIBILITIES, AND CAPACITY BUILDING

6.1. Institutional responsibilities and accountability structure

Throughout the road rehabilitation works under the Project, employment relations, working conditions, and occupational safety arrangements for all personnel shall be organized in accordance with World Bank Environmental and Social Standard ESS2 (Labor and Working Conditions) and the applicable laws and regulations of Mongolia.

Environmental and social management follows a three-tier structure:

- Strategic oversight and accountability – IPIU / Employer
- Independent supervision and verification – Supervision Engineer
- Implementation and first-line control – Contractor

The Contractor shall prepare a Contractor ESMP (C-ESMP) fully aligned with this P-ESMP. No works shall commence until the C-ESMP and all subsidiary plans are approved.

Table 60. **Main Institutional Roles and Responsibilities**

Party / Institution	Main Environmental and Social Responsibilities
IPIU / Employer (MRT)	Primary owner of this P-ESMP and all E&S instruments. Accountability to the World Bank for ESF/ESCP compliance. Disclosure of project documents on the MRT website. Strategic oversight of all environmental and social implementation. Approval and clearance of subsidiary plans and the C-ESMP. Issuance of the Notice to Commence (per section). Receipt of monthly E&S verification reports from the Supervision Engineer. Management of the central GRM register. Oversight of ESS5 compliance (land, access, livelihoods). Reporting to the World Bank, including serious incident notification within 24 hours. Coordination with regulatory authorities and sector ministries.
Supervision Engineer	Review and clearance of all Contractor-prepared plans and method statements. Independent field inspection and verification of ESMP compliance. Issuance of Non-Conformity Notices (NCNs) and Corrective Action Plans (CAPs). Certification of monthly environmental and social compliance reports before submission to IPIU. Attendance at monthly E&S coordination meetings. Verification of community GRM and worker GRM functionality. Pre-section readiness verification against the go/no-go checklist. Certification of site rehabilitation and closure at each section.
Contractor	Preparation and submission of the C-ESMP and all required subsidiary plans for Supervision Engineer approval. Day-to-day C-ESMP implementation at all work fronts, camps, quarries, and plant sites. Deployment and management of qualified E&S team: Social Specialist, Environmental Specialist, OHS Officer, CLO. Site-level community and worker GRM intake, registration, and initial resolution. Stakeholder notification, community briefings, and monthly bulletin preparation. Worker induction, Code of Conduct enforcement, SEA/SH training, and cultural sensitivity training. Environmental monitoring, records, and monthly reporting to the Supervision Engineer. Subcontractor management and compliance. Contractor is also the Designer. All design-stage E&S obligations, including road safety design, livestock crossing design, and community safety features, are the Contractor's responsibility under this dual role. The IPIU (as Employer) owns and approves the design against requirements of this P-ESMP before any works commence.

Soum/Bag Administrations	Local coordination for community notification and consultation. Support for GRM intake at soum offices (drop-boxes, verbal submissions). Facilitation of outreach to vulnerable groups, elderly persons, and remote herder households. Coordination of livestock crossing schedules and emergency access arrangements. Interface for local authority permits and site approvals. Participation in pre-construction and during-construction community meetings.
Police / Traffic Authorities	Traffic management enforcement in work zones. Coordination on TMP implementation and work-zone safety before each section commences. Support during major closures, traffic incidents, and community safety incidents. Joint monthly inspections with Contractor TMO and Supervision Engineer.

6.2. Environmental and social risk management cycle

E&S management is implemented through a four-step cycle that repeats as new sections, quarries, camps, or activities are activated. Disclosure (Step 3) is an explicit required step before implementation commences, not an optional add-on.

Table 61. Environmental and Social Management Cycle

Step	Main Action	Main Output
Step 1 Risk Identification and Screening	Assess site conditions; scope of works; technologies; methods; sensitive receptors; temporary footprints; seasonal factors; cumulative effects. Apply ESS5 screening per section.	Risk profile; section-specific screening record
Step 2 Documentation Preparation	Prepare ESMP section procedures; method statements; subsidiary plans; training tools; GRM procedures; reporting formats; monitoring forms.	Draft implementation package; Contractor C-ESMP sections
Step 3 Review, Approval, and Disclosure	Submit for Supervision Engineer review; IPIU clearance; disclose required documents on MRT website and World Bank portal; notify affected communities; update evidence archive.	Approved and disclosed implementation package; disclosure log
Step 4 Implementation, Monitoring, and Reporting	Implement measures; monitor performance against ESMP requirements and corrective action thresholds; report monthly; investigate incidents; undertake corrective and preventive action.	Verified implementation; monthly E&S reports; incident records; continuous improvement

6.3. Pre-construction readiness and go/no go conditions

No civil works shall commence on any section until all readiness conditions in below table have been fully satisfied for that section, verified by the Supervision Engineer, and confirmed by the IPIU through issuance of the Notice to Commence. These are hard go/no-go gates and may not be waived.

Table 62. Implementation Readiness Conditions Prior to Commencement of Civil Works

No.	Requirement	Specific Condition	Verified By

1	Approved section-specific implementation package	Site-specific procedures; method statements; and management arrangements for the relevant section reviewed and approved by Supervision Engineer; IPIU notified	Supervision Engineer; IPIU
2	C-ESMP and all mandatory subsidiary plans approved	C-ESMP and relevant subplans all finalized and approved before relevant works commence	Supervision Engineer (review and approve); IPIU (clearance for high-risk plans)
3	Community GRM fully operational	All channels disclosed and accessible: hotline operational; Mongolian-language forms available at camp and three soum offices; drop-boxes installed and CLO designated with keys; confidential SEA/SH channel active with female GBV Focal Point named	IPIU GRM Officer; Supervision Engineer verification
4	Worker GRM fully operational	Worker channels communicated to all workers; IPIU direct phone number posted in dormitories in Mongolian and Chinese; anti-retaliation guarantee communicated; SEA/SH confidential channel confirmed operational and separate	Supervision Engineer; IPIU Social Specialist
5	Permits and site verifications complete	Camp siting approval from soum governor; quarry operating permits; temporary land-use verification and herder agreements documented and signed; water abstraction arrangements; waste disposal contract with licensed provider; foreign worker employment permits verified; annual EMP submission prepared	Contractor; IPIU coordination; Supervision Engineer verification
6	Workforce induction and mandatory training complete	All workers completed: OHS induction (min. 2 hours); Code of Conduct signing; SEA/SH awareness; GRM awareness; environmental induction; cultural sensitivity (non-Mongolian workers). Training records signed and filed. No worker starts without completed induction and signed CoC.	Contractor HR/OHS; Supervision Engineer audit
7	Stakeholder notification and pre-construction consultation complete	Open community meetings in Bayandelger; Tsenkhermandal; and Murun soums completed with signed attendance lists and photos. Women-only session completed in each soum. Herder household consultations documented with GPS route maps. Advance notices distributed. GRM information posted. Evidence archived in IPIU e-archive.	IPIU Social Specialist; Contractor CLO support; Supervision Engineer verification
8	ESS5 section-by-section screening confirmed	Verification that temporary land occupation; access restriction; livestock movement interference; and economic displacement (if any) for the specific section have been identified; herder consent documents signed where required; compensation arrangements confirmed and documented.	IPIU Social Specialist; Supervision Engineer
9	Baseline monitoring arrangements confirmed	Monitoring stations geo-referenced and staked. Accredited laboratory contracted. Baseline air; noise; water; and soil readings collected at all monitoring stations. Environmental monitoring plan approved.	Contractor Environmental Specialist; Supervision Engineer

10	Emergency access and traffic safety arrangements in place	Ambulance and emergency access contacts confirmed for relevant soum health centre and Undurkhaan District Hospital. Medevac procedure documented and tested for sections more than 50 km from hospital. All TMP signage is inspected and certified by the Supervision Engineer and Traffic Police before the section opens. Police and traffic authority coordination confirmed.	Contractor OHS Officer / TMO; Supervision Engineer; IPIU
11	Monitoring; reporting; and incident notification system operational	Reporting formats approved. Incident escalation protocol (Level 1/2/3) communicated to all parties. Monthly reporting cycle confirmed. NCN and CAP system in place and understood by Contractor management. GRM log template approved.	IPIU; Supervision Engineer; Contractor

6.4. Monitoring and reporting

Effective implementation of this ESMP requires a structured system of monitoring, verification, and reporting that ensures compliance with mitigation measures, early identification of risks, and timely corrective action. Monitoring is designed as a multi-tiered system, where responsibilities are distributed across implementation, verification, and oversight levels to ensure both accountability and independence.

Monitoring shall cover all environmental and social aspects of the Project, including environmental parameters, occupational health and safety, labour and working conditions, stakeholder engagement, and grievance redress. All monitoring activities shall be documented, verifiable, and auditable.

Table 63. Monitoring Levels

Level	Main Function	Principal Outputs
Contractor (field level)	Day-to-day implementation; site records; first-line control; immediate incident notification	Daily logs; inspection forms; monitoring records
Supervision Engineer (verification level)	Technical and E&S supervision; field verification; spot inspections; NCN issuance; monthly compliance certification	Verification reports; NCN/CAP records; monthly certification
IPIU (strategic oversight level)	Consolidated oversight; World Bank reporting; corrective action management; GRM oversight; readiness control; post-construction monitoring	Quarterly reports; management decisions; WB correspondence
World Bank / external supervision	Portfolio-level oversight; supervision missions; compliance review; GRS processing	Aide-mémoires; supervision mission reports; corrective action tracking

Monitoring results shall be systematically reflected in monthly and quarterly environmental and social reports. The system is designed not only to track compliance but also to identify trends, recurring issues, and systemic risks that require management attention.

Serious incidents, major non-compliance, high-risk complaints (including SEA/SH-related grievances), and significant exceedances of environmental standards shall be reported immediately through the Project's incident escalation system. This ensures rapid response and alignment with World Bank notification requirements.

In addition to planned monitoring activities, unannounced inspections may be undertaken by the Supervision Engineer and/or IPIU on a sample basis to verify actual site conditions and ensure the integrity of reported data.
Detailed Environmental and Social Monitoring plan can be found in Chapter 9 of this ESMP.

6.5. Post-construction and operational phase management

Once the Taking-Over Certificate is issued for a section, operational management responsibilities transition from the Contractor to the IPIU and subsequently to MRT/Road Maintenance Authority. The following obligations apply:

- Post-Construction Community Feedback Channel: established before the project-level GRM formally closes. Phone/SMS number accessible at all three soum offices; maintained by the IPIU for a minimum of 2 years post-completion; publicised through soum offices and bag networks.
- GRM Closure Report: submitted to the World Bank before the Performance Certificate is issued. Confirms all outstanding community and worker cases are resolved or formally transferred to the post-construction register with defined resolution timelines.
- Transition of unresolved cases: any outstanding grievances, pending compensation claims, or incomplete site restoration commitments at Taking-Over are transferred to an IPIU-managed register with defined resolution timelines before the Contractor demobilizes from the relevant section.
- GPS-referenced asset data transfer: all asset data (signage; livestock crossing points; drainage structures; crash-risk locations) transferred to the MRT RAMS database at handover in a format compatible with the MRT GIS platform.
- Annual E&S monitoring reports: submitted by IPIU to the World Bank for at least 3 years post-completion, covering road safety data, rehabilitation performance, residual environmental and social impacts, and user satisfaction results.

6.6. TRAINING AND CAPACITY BUILDING PLAN

A structured training programme will be implemented for all parties to ensure effective ESMP implementation. Training records (attendance sheets with names, roles, and signatures; signed Code of Conduct and CoC acknowledgement forms; PPE issue logs, etc) must be maintained and submitted as part of the monthly EHS report.

Refresher training is triggered without waiting for the next scheduled date if: (a) PPE compliance falls below 95% in any inspection; (b) an OHS incident occurs: topic-specific refresher within 5 working days; (c) a GBV/SEA complaint is received: full GBV/SEA refresher for all workers within 48 hours; (d) a new cohort of workers joins mid-project; (e) an environmental monitoring action trigger is breached: topic-specific refresher.

Table 64. Training Categories and Implementation Summary

No.	Training Topic	Target Group	Timing / Schedule	Location	Responsible Party	Key Content	Verification Mechanism	Estimated Cost (MNT thousand)
1	OHS Induction (General Safety)	All workers — no exceptions, including subcontractor personnel	Month 1 / Before first shift on site; refresher if gap >3 months	Camp / site	Contractor OHS Officer	Hazard awareness; PPE requirements; emergency procedures; right to refuse unsafe work; incident reporting. Min. 2-hour session. Sign-off mandatory.	Sign-off sheet; training register; Supervision Engineer verification	MNT covered under operational cost
2	Daily OHS Toolbox Talk	All site workers	Daily (10–15 min at work front)	Work front	Contractor OHS Officer / Site Foreman	Task-specific hazards; daily weather/seasonal risk; PPE check; near-miss reporting	Daily OHS log entry	Covered under operational cost
3	First Aid and Emergency Response	OHS staff; site engineers; min. 1 designated first-aider per shift	Month 1 before mobilization; semi-annual refresher drill thereafter	Camp / professional institution	Contractor OHS Officer + medical provider	CPR; first aid; fire extinguisher; spill containment; evacuation; medevac procedure tested per section	Attendance sheet; drill record; certificate (professional provider)	19 persons × MNT 110,000 = 2,090,000
4	Driver and Equipment Operator Safety	All vehicle drivers and equipment operators	Before operating any vehicle on project; refresher after any incident	Camp / site + Traffic Police participation	Contractor OHS Officer; Traffic Police liaison	Defensive driving; livestock crossing protocols; haul road speed limits; pre-start checks; no alcohol or drugs; load securing	Attendance sheet; driving check record; operator competency sign-off	67 persons × MNT 100,000 = 6,700,000
5	Fire Safety and Spill Response	Fuel station staff; plant operators; camp manager	Before camp/plant operation; annual refresher	Camp / fuel store	Contractor OHS Officer	Fire extinguisher use; bunded storage; spill kit deployment; emergency contacts; reporting chain	Attendance sheet; drill record	5 persons × MNT 100,000 = 500,000
6	Emergency Preparedness (fire; severe weather; flood)	All workers	Before mobilization; semi-annual drill	Camp / site	Contractor OHS Officer	Evacuation routes; assembly points; severe weather protocol (cold <−25°C; heat >35.82 °C); incident escalation	Drill record; assembly register	Covered under operational cost

7	Hazardous Chemicals and Laboratory Safety	Laboratory staff; plant operators handling chemicals	Before handling; refresher as needed	Laboratory / plant	Contractor OHS Officer	SDS review; PPE for chemicals; spill response; disposal; labelling	Attendance sheet; SDS acknowledgement	2 persons × MNT 190,000 = 380,000
8	ESF / ESMP Overview and Compliance Obligations	Contractor management; E&S team; Supervision Engineer E&S staff; IPIU staff	Month 1 (within 30 days of contract signature); 6-month refresher	Camp / office / IPIU facility	IPIU Social and Environmental Specialists; WB support where available	ESS applicability; C-ESMP obligations; NCN and CAP system; reporting requirements; escalation protocol; GRM structure; ESCP commitments	Attendance sheet; knowledge check; IPIU training record	Covered under operational cost
9	Code of Conduct and SEA/SH Prevention	All workers including subcontractor personnel	Before deployment (pre-works induction); quarterly refresher	Camp (dedicated session)	Contractor Social Specialist + independent GBV specialist (quarterly audit)	Prohibited conduct definitions; reporting channels; zero-tolerance policy; anonymity protection; cultural sensitivity for non-Mongolian workers (herder customs; land use; ovoo; seasonal norms). Role-play scenarios used.	Signed CoC form; attendance sheet; quarterly audit report by GBV specialist	Covered under operational cost (GBV audit: see budget)
10	GRM Awareness — Workers and Community	All workers; community sessions per section	Before construction on each section; quarterly community refresher	Camp (workers); soum centres (community)	Contractor CLO; IPIU Social Specialist	GRM channels and timelines; confidentiality guarantee; anti-retaliation; how to submit anonymously; SEA/SH channel details; WB GRS availability	Attendance sheet; photo evidence; GRM leaflet distribution log	Covered under operational cost
11	Environmental Management (waste; spill; dust; water protection)	All workers; plant operators	Before mobilization; refresher when new sections open	Camp / site	Contractor Environmental Specialist	Waste segregation; hazardous waste handling; dust suppression; spill containment; no discharge to watercourses; well buffer zone; topsoil protection	Attendance sheet; competency check	Covered under operational cost

12	Biodiversity and Cultural Heritage Awareness	All workers	During general induction; before earthworks on any new section	Camp / site	Contractor Environmental Specialist	No-go zones; wildlife collision reporting; chance finds: step-by-step stop-work procedure; hunting prohibition; flora collection prohibition; plant identification photos displayed at camp	Attendance sheet; chance finds poster acknowledgement	Covered under operational cost
13	Food Hygiene and Camp Sanitation	Camp manager; kitchen staff; camp hygiene officer	Before camp opens; refresher June and August 2026; April 2027	Camp kitchen / sanitation facilities	Contractor OHS Officer + health provider	Food storage temperatures; personal hygiene; kitchen waste; vector/vermin prevention; water treatment; sanitation standards	Attendance sheet; health provider certificate	Covered under operational cost
14	Labour Relations; Internal Rules; and Worker Rights	All workers	Before mobilization; annual refresher	Camp	Contractor HR / Social Specialist	Employment contract obligations; wage schedule; payment dates; working hours; grievance rights; no forced labour; no document confiscation; no child labour; IPIU direct channel	Attendance sheet; signed acknowledgement of rights	Covered under operational cost
15	Cultural Sensitivity (dedicated module for non-Mongolian workers)	All non-Mongolian (CRBC Chinese) workers	Month 1 before deployment; refresher if significant cultural incidents occur	Camp	Contractor Social Specialist; Mongolian cultural liaison (local hire)	Mongolian pastoral customs; herder protocol; treatment of sacred sites (ovoo); seasonal livestock movement; respectful community interaction; local language basics (greetings; key phrases)	Attendance sheet; cultural liaison confirmation record; IPIU Social Specialist verification	Covered under operational cost

CHAPTER 7. INFORMATION DISCLOSURE AND PUBLIC CONSULTATION

Stakeholder engagement for the Project is implemented within the framework of the overarching MTCLIP Stakeholder Engagement Plan (SEP), originally prepared in July 2021 and updated in June 2023 and February 2026. The Project SEP establishes project-wide stakeholder engagement, information disclosure, consultation, and grievance management requirements in accordance with the World Bank ESF, particularly ESS10: Stakeholder Engagement and Information Disclosure.

This section supplements the project SEP by defining corridor-specific engagement measures, consultation obligations, disclosure arrangements, and grievance management procedures applicable to the construction phase of the road section. The approach reflects the social and environmental risks identified in this ESMP, including impacts on herder communities, roadside businesses, tourism activities, road users, vulnerable groups, and communities located near camps, borrow areas, and quarry sites.

The SEP applies throughout pre-construction, construction, rehabilitation, and early operation phases and shall be implemented together with the Project ESMF, Labor Management Procedures (LMP), Resettlement instruments, and GRM.

IPIU primary responsibilities:

- Lead all formal pre-construction community consultations in each affected soum, including women-only sessions and outreach to vulnerable groups.
- Disclose all key project documents (ESMP, SEP, GRM procedures, LMP, E&S monitoring reports) on the MRT official website (https://mrt.gov.mn) and the World Bank project portal before construction commences and within 5 days of any material revision.
- Maintain the central GRM register on the MRT internal web server (per ESMF requirement).
- Prepare, approve, and quarterly update the SEP; re-disclose updated version on MRT website within 5 working days of approval.
- Commission biannual community perception surveys disaggregated by gender and livelihood type.
- Archive all evidence of disclosure and consultation in a project e-archive accessible to the Supervision Engineer and World Bank upon request.

Contractor responsibilities (site-level support):

- Deploy a qualified CLO (Mongolian-fluent; community engagement experience; approved TOR) before any workers arrive on site.
- Establish and operate GRM intake points at site offices and soum offices before mobilization.
- Provide advance notifications to households and businesses 3–5 days before high-impact activities.
- Prepare and distribute monthly Mongolian-language construction bulletins to all households within 300m of active works.

- Maintain a site-level grievance log and forward all complaints to the IPIU GRM Officer within 1 working day of receipt.
- Support IPIU-led community meetings through logistics, translation, and documentation assistance.

7.1. Stakeholder engagement plan

Table 64. Stakeholder Engagement Plan

Stakeholder Group	Key Issues	Method of Engagement	Frequency	Responsible Party	Type of Record
Soum Governors (Taragt, Khairkhandulaan)	Permits (TLUA, quarry, camp), work schedule, seasonal alignment, emergency access, GRM escalation, restoration acceptance	Official letters; coordination meetings; phone/email; CLO liaison	Pre-construction; monthly; section changes; incidents (<24h); post-construction (24 months)	Contractor (CLO, Site Manager); IPIU	Letters; meeting minutes; call logs; CLO reports
Bag Governors & Community Leaders	Info dissemination; vulnerable HH identification; migration routes; dust/noise feedback; road closures	Monthly meetings; Facebook/Messenger updates; phone; leaflets; CLO coordination	Monthly; weekly updates; 48h notice for impacts	Contractor (CLO); IPIU	Meeting records; social media logs; leaflet register; call logs
Herder Households (~307 HH)	Livestock crossings; access to water/pasture; traffic risks; TLUA; compensation; restoration	Ger visits; group meetings; Facebook/Messenger (maps); phone; TLUA consultations	Before each section; weekly updates; seasonal meetings; monthly	Contractor (CLO); IPIU	CLO logs; signed TLUA; maps; meeting records; GRM register
Roadside Businesses & Tourism Operators (incl. Great Horse Shrine)	Road closures (peak season); Naadam traffic; access; dust/noise; income impacts	Dedicated meetings; social media notices (≥14 days); physical notices; direct contact; media announcements	Pre-construction; monthly (Jun–Sep); as needed	Contractor (CLO); IPIU	Meeting minutes; notices; social media records; GRM business log
Road Corridor Households (≤1 km)	Dust/noise; access disruption; blasting/night works; water impacts; health concerns	Door-to-door visits; advance notices (3–5 days; 48–72h for high impact); notice boards; phone; social media	Before each section; weekly during works	Contractor (CLO, EHS); Supervision	Visit logs; notice register; photos; call logs
Quarry & Camp Communities	Dust, blasting, transport, water pollution, worker interaction, safety zones	Pre-quarry meetings; blast notifications (≥24h); monthly	Pre-activity; per blast; monthly	Contractor (CLO, HSE); IPIU	Meeting records; blast logs; notices; monitoring logs

		visits; notice boards; social media			
Road Users (Public, Freight, Tourists)	Traffic safety; detours; delays; signage; tourism season impacts	Signage; flagmen; social media (≥14 days); notice boards; national media	Continuous; weekly updates; pre-closure notice	Contractor; IPIU	Photos; traffic logs; deployment records
Vulnerable Groups	Accessible info; safe mobility; GRM access; service continuity	Social worker outreach; phone calls; simplified materials; assisted GRM; CLO registry	Monthly; before nearby works; immediate follow-up	Contractor (CLO); IPIU; Social Workers	Vulnerable register; call logs; GRM records
Traffic Police	TMP approval; enforcement; accident response; Naadam traffic	TMP submission; joint inspections; direct contact; incident notification	Pre-section; monthly; per incident	Contractor; IPIU	Approved TMP; inspection records; incident logs
Health & Emergency Services	Emergency access; preparedness; evacuation; accident response	Official notices; contact list; joint drill; direct communication	Pre-construction; quarterly; per incident	Contractor (HSE, CLO); IPIU	Letters; drill records; contact list; incident logs
IPIU / MoRTD / World Bank	ESMP compliance; reporting; incidents; audits; supervision	Monthly reports; incident notification (4h/24h/48h); audits; WB missions	Monthly; quarterly; as needed	Contractor; IPIU	Reports; audit records; WB mission notes; GRM database

Project relevance: This plan provides the minimum stakeholder engagement framework for the construction phase. It should be implemented in conjunction with the Project SEP and the Grievance Redress Mechanism and updated in line with construction sequencing, seasonal sensitivities, and changes in the affected stakeholder profile.

7.2. CONSULTATION MEETINGS CONDUCTED WITH STAKEHOLDERS

The table below cross-references the comments and suggestions collected during three consultation events (18 November 2025, 20 March 2025, and 7 April 2026**)** against the relevant mitigation measures in Chapter 6 of the ESMP. Based on this verification, 57 percent of stakeholder comments were found to be fully incorporated, while 43 percent were partially incorporated into the ESMP.

Table 65. Summary of Stakeholder Feedback and Its Incorporation into the ESMP

A. Road safety and signage

No.	Type of Comment / Request	Content of Comment / Request	Source / Location / Date	ESMP Cross-Reference	Status
1	Installation of speed calming measures	Measures should be introduced to reduce driver speed in curved sections; speed calming devices are needed at turning points.	Household survey, 18/11/2025	Item 21 (Community Safety): Traffic Management Plan, protective measures, speed limit ≤30 km/h. Item 28 (Operation Phase: Road Safety): road safety audit and installation of speed calming devices in settlement areas and near schools.	Partially incorporated in the ESMP
2	Improvement of road signs and markings	Necessary road signs and markings should be installed and improved.	Household survey, 18/11/2025 and 07/04/2026	Item 21: TMP to include full provision of signs, road markings, and lighting. Item 22: detour roads to be clearly signed. Item 28 (Operation): update signs in accordance with MNS 4597:2014 and MNS 4759:2014.	Fully incorporated in the ESMP
3	Installation of livestock warning signs	Warning signs should be installed in sections where livestock frequently cross the road.	Household survey, 18/11/2025 and 07/04/2026	Item 14 (Fauna): speed limits and warning signs; speed ≤20 km/h in livestock crossing areas. Item 21: livestock and pedestrian crossings to be planned in consultation with herders. Item 28 (Operation): livestock and pedestrian crossings; special signs near the Great Horse Shrine.	Fully incorporated in the ESMP

B. Livestock and herders' rights

No.	Type of Comment / Request	Content of Comment / Request	Source / Location / Date	ESMP Cross-Reference	Status
4	Construction of livestock crossings	Livestock crossings should be established where the alignment cuts through herders' grazing areas.	Household survey, 18/11/2025	Item 3 (Pre-construction: ESS5): consultation with 304 herder households and confirmation of continued access to pasture. Item 14: define livestock movement routes within site boundaries. Item 21: livestock crossings to be planned in consultation with local residents.	Partially incorporated in the ESMP
5	Rehabilitation of quarries	Quarries should be rehabilitated after use and restored as close as possible to natural conditions.	Household survey, 07/04/2026	Item 27 (Operation Phase: Rehabilitation): technical and biological rehabilitation of 8 quarries in 2027; verification of ≥60% vegetation cover by spring 2028; herder acceptance documentation; compliance with MNS 5914:2008 and MNS 5918:2023.	Fully incorporated in the ESMP
6	Waste at stopping points causing harm to livestock	People stopping along the road discard waste indiscriminately, which livestock ingest and die from; stopping places should not be created at	Household survey, 07/04/2026	Item 16 (Waste): internal rules prohibiting open dumping; 12 segregated waste bins. Item 21: active GRM and transparent information disclosure. Concerns related to waste transport and cleaning at roadside stopping points to be communicated to relevant responsible entities.	Partially incorporated in the ESMP; aspects falling outside the Project scope to

		undefined locations and should be kept clean.			be referred to the relevant authorities

C. Infrastructure – drainage

No.	Type of Comment / Request	Content of Comment / Request	Source / Location / Date	ESMP Cross-Reference	Status
7	Upgrade of flood culverts	Previously improperly constructed flood culverts should be corrected and rebuilt properly.	Consultation meeting and household survey, 18/11/2025	Item 4 (Pre-construction: TMP, camp, and quarry planning): drainage structure planning to be included in the TMP. Item 15 (Natural Hazards): keep drainage channels, culverts, and ditches open during construction. Item 28 (Operation): road safety audit and inspection of drainage structures. Technical design provides for stone-lined drainage channels in 20 cm cement mortar.	Included in the ESMP; design supervision to be completed and information disclosed to the public
8	Construction of drainage embankments with access points	Flood protection embankments with crossing/access points should be constructed based on appropriate hydrological calculations.	Household survey, 18/11/2025	Item 4: consult local communities on embankment locations as part of TMP and quarry planning. Item 15: maintain flood protection materials and pumps. Technical design identifies the locations of artificial drainage structures along the 35.82 km alignment based on hydrological calculations.	Fully incorporated in the ESMP
9	Provision of roadside descent/access points	Descent/access points should be provided for herders and other road users.	Household survey, 18/11/2025	Item 21: TMP to ensure access and egress. Item 22: temporary and detour roads to be clearly marked. Item 28 (Operation): provide access/entry points for local residents, herders, and livestock.	Partially incorporated in the ESMP

D. Environment – dust and waste

No.	Type of Comment / Request	Content of Comment / Request	Source / Location / Date	ESMP Cross-Reference	Status
10	Dust suppression during construction	During road rehabilitation, measures should be taken to avoid inconvenience to visitors and to minimize dust generation.	Household survey, 18/11/2025 and 07/04/2026	Item 8 (Air Quality): watering by 7 water trucks once every 1–2 days; use of a single transport route. Item 20 (Business income): scheduling works outside the peak tourism season (October–May). Item 21: dust reduction through speed limits (≤30 km/h) and covering truck beds.	Fully incorporated in the ESMP
11	Prevention of environmental pollution at stopping areas	Avoiding the creation of stopping areas at undefined locations will help prevent environmental pollution; stopping points should be properly organized.	Consultation meeting and household survey, 18/11/2025 and 07/04/2026	Item 5 (Resource Use): integrated waste management plan. Item 16: 12 segregated waste bins around stopping areas and camps; prohibition of open dumping. Item 26 (Operation): install signs prohibiting waste dumping along the road. Additional waste management oversight around the Great Horse Shrine to be communicated to road users and local government.	Included in the ESMP; aspects outside the Project scope to be referred to the relevant authorities

E. Social issues – safety, vulnerable groups, participation

No.	Type of Comment / Request	Content of Comment / Request	Source / Location / Date	ESMP Cross-Reference	Status
12	Safety of tourists and children during construction	During road rehabilitation, large numbers of visitors, including children, come to the area; temporary road safety and dust suppression should therefore be ensured, with special attention to children and vulnerable groups.	Household survey, 07/04/2026	Item 6 (Training): special instruction related to the safety of tourists and children traveling to the Great Horse Shrine. Item 21: protection of vulnerable groups. Item 5a (Great Horse Shrine): maintain access for visitors during Naadam (July) and peak seasons. Item 22: additional TMP measures for visitor and tourist safety.	Fully incorporated in the ESMP
13	Delivery of information to stakeholders	Maintain regular consultation with soum governors and Citizens' Representative Khural chairs; provide advance notice to herders, business operators, and road users regarding construction schedules and road closures.	Consultation meeting and household survey, 18/11/2025 and 20/03/2025	Item 2 (Public Participation and GRM): regular consultation with soum and bag Governor's Offices; establishment of the GRM. Item 21: road closure notices at least 7 days in advance; implementation in accordance with the SEP schedule in Table 52. Item 22: advance notification through social media, SMS, and signboards.	Fully incorporated in the ESMP

The majority of respondents**,** 85.7 percent**,** indicated that they fully support the Project, while the remaining 14.3 percent did not respond to the survey. This suggests a very high level of positive expectation toward the Project among surveyed stakeholders.

CHAPTER 8. GRIEVANCE AND FEEDBACK REDRESS MECHANISM

8.1. Grievance redress mechanism (GRM)

The Project will implement a Grievance Redress Mechanism (GRM) in line with the World Bank ESF, particularly ESS10 on Stakeholder Engagement and Information Disclosure. The GRM applies to the MTCLIP (P174806) and its Additional Financing. The GRM described in this section reflects the approved version dated 23 February 2026.

It provides a structured, transparent, and accessible system for receiving, recording, tracking, and resolving grievances related to environmental, social, labor, occupational health and safety (OHS), traffic safety, land access, and other project-related impacts across all project phases. The GRM complements, but does not replace, national judicial and administrative grievance systems.

8.2. Community grievance redress mechanism

The community GRM is designed for PAPs, local residents, vulnerable groups, road users, businesses, and civil society organizations. It covers grievances related to environmental impacts (dust, noise, pollution, vibration), social impacts (land access, livelihoods, community safety), traffic safety, stakeholder engagement, and general project implementation issues.

Access is ensured through multiple entry points:

- Contractor site-level focal points and grievance boxes
- Local soum and bag authorities assisting vulnerable complainants
- Project-level channels (IPIU email, phone, written and digital platforms)
- National systems such as the 11-11 citizen hotline
- Anonymous submission options

All grievances are registered within 24 hours, acknowledged within 2 working days, screened within 3 working days, and resolved within 20 working days where feasible. The IPIU maintains overall responsibility for coordination, monitoring, and closure.

8.3 Workers' grievance redress mechanism

A separate Workers' GRM will be established by each contractor in accordance with ESS2 and the Labor Management Procedures (LMP). It applies to all project workers, including direct, contracted, and primary supply chain workers. The mechanism covers employment-related grievances such as wages, working conditions, occupational health and safety, workplace conduct, and disciplinary matters. Workers may submit grievances through site-based focal points or designated channels, with resolution targeted within 15 working days where feasible. Workers also retain the right to access national labor dispute resolution mechanisms.

8.4 Sensitive grievance handling (GBV/SEA/SH)

Grievances involving Gender-Based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH) are handled through a confidential, survivor-centered referral pathway.

These cases are not processed through the standard GRM investigation procedure. Instead:

- Immediate referral to qualified service providers is required
- Informed consent and strict confidentiality are ensured
- No internal investigation or mediation is conducted by project staff
- Records are anonymized and used only for monitoring purposes
- Survivors are protected from retaliation and supported through access to national services

This approach ensures safety, dignity, and compliance with World Bank requirements.

8.5 Grievance handling process and escalation

The GRM follows a structured six-stage process:

1. Receipt and registration within 24 hours
2. Acknowledgment within 2 working days
3. Screening and categorization within 3 working days
4. Investigation and resolution within 20 working days
5. Implementation and closure verification by IPIU
6. Escalation to contractor, IPIU, or MRT senior management if unresolved

At all stages, complainants retain the right to access external legal or administrative remedies.

8.6 Institutional responsibilities, monitoring, and reporting

Contractors are responsible for first-line grievance intake and site-level resolution, while the CSC provides compliance oversight. The IPIU manages the centralized GRM database, classification, monitoring, and reporting, and MRT provides strategic oversight and escalation review.

Performance indicators include timely registration, acknowledgment, and resolution (with a target of at least 80% resolved within 20 working days and 70% satisfaction rate). GRM data is analyzed for trends to improve mitigation measures and project performance.

Reporting is conducted monthly internally and quarterly to MRT and the World Bank. External grievance mechanisms remain fully accessible, including national courts, the National Human Rights Commission of Mongolia, labor dispute systems, and the World Bank’s Grievance Redress Service and Inspection Panel.

CHAPTER 9. ENVIRONMENTAL AND SOCIAL MONITORING

In Mongolia, the legal basis for environmental monitoring and oversight is established through relevant laws, regulations, procedures, and national standards. Within the framework of this Project, regular monitoring, evaluation, and timely corrective action in relation to environmental quality are an integral part of state environmental protection policy and legal compliance.

Defining baseline environmental monitoring indicators is a fundamental means of assessing the quality status of environmental components such as air, water, soil, noise, and biodiversity. These indicators are essential for determining the presence of pollutants, assessing impacts arising from human activities, evaluating the effectiveness of waste management, and planning measures to reduce adverse impacts.

Environmental monitoring under this Project shall be implemented in accordance with the following legal and policy instruments:

- Law on Environmental Protection (1995, revised version)
- Law on Environmental Impact Assessment (2012, revised version)
- Law on Waste (2017)
- Land Law (2002)
- Procedure for Preparation, Review, Approval, and Reporting of Environmental Management Plans (2019)
- Relevant national standards / see Chapter 2 for details

Under this legal framework, and specifically in accordance with the 2019 Procedure for Preparation, Review, Approval, and Reporting of Environmental Management Plans, the Project's environmental monitoring shall be implemented in a systematic and planned manner.

Accordingly, the following Environmental Monitoring Plan has been developed in order to regularly observe changes in environmental components during both the implementation and operation phases of the Project, undertake measurement and analysis, document and report results, and apply corrective measures where necessary. The road rehabilitation Contractor shall implement an environmental and social monitoring program during all phases of Project construction and operation in order to ensure the effective implementation of the activities set out in the ESMP, particularly the mitigation measures for environmental and social impacts. In addition, it shall be necessary to evaluate how environmental and social indicators respond to Project activities under the monitoring program. Based on monitoring checklists prepared by the Contractor, monthly and quarterly monitoring shall be undertaken during construction.

The Contractor shall also monitor changes in baseline environmental conditions during the road construction phase, evaluate the effectiveness of mitigation measures, and implement corrective actions where necessary, particularly where potential construction-related impacts cannot be fully avoided or reduced through preventive measures.

The Contractor shall organize the monitoring activities, while implementation shall be overseen by the IPIU. This construction supervision consultant shall verify whether the Contractor complies

with contractual requirements during construction and operation and whether the participation of key stakeholders in implementation and oversight is being appropriately maintained.

The following minimum monitoring and supervision requirements shall apply:

- Conduct monthly and quarterly environmental and social inspections to confirm full compliance with the conditions set out in the ESIA/ESMP, as well as World Bank requirements, national requirements, and applicable standards. Unannounced site inspections may also be conducted on a sample basis.
- Ensure that inspection findings are reflected in monitoring reports and followed by corrective actions.

Monitoring criteria, including threshold values, parameters, locations, frequency, and responsible monitoring entities, shall be specified in the monitoring plan.

Table 66. Monitoring Plan

During Project Implementation Phase

Monitoring Indicator	Location	Frequency / Timing	Applicable Methodology / Standard	Total Cost – Year 1 (Implementation Phase)	Total Cost – Year 2 (Operation Phase)	Implementing Entity	Supervising / Oversight Entity
Air: Dust (µg/m³), CO (µg/m³), SO_2 (µg/m³), NO_2 (µg/m³)	5 monitoring points near the Project site	Monthly during construction season 2026 and 2027	Air Quality – MNS 4585:2025, General Technical Requirements for Permissible Limits of Pollutants in Ambient Air; MNS 5885:2008	Measurement cost × 10	Measurement cost × 10	The Contractor shall engage a qualified professional entity.	CSC and IPIU
Noise: Maximum level, dBA	5 monitoring points near the Project site	Monthly during construction season 2026 and 2027	MNS 4585:2025, as cited in the source text	Measurement cost × 10	Measurement cost × 10	The Contractor shall engage a qualified professional entity.	CSC and IPIU
Water: Hydrochemical parameters (mg/L); physical parameters, including temperature (°C); biological contamination indicators; heavy metals: Arsenic (As), Lead (Pb), Zinc (Zn), Cadmium (Cd), Iron (Fe), Copper (Cu)	3 points at herders' wells located near the Project site	Monthly during construction season 2026 and 2027	Water Environment Quality – MNS 4586:2024; Hygiene Requirements for Drinking Water for Protection of Environment and Public Health – MNS 0900:2018	Laboratory analysis cost × 6	Laboratory analysis cost × 6	The Contractor shall engage a qualified professional entity and use an accredited laboratory.	CSC and IPIU

Soil: Mechanical composition and physical properties of soil; agrochemical properties; heavy metals: Arsenic (As), Lead (Pb), Zinc (Zn), Cadmium (Cd), Iron (Fe), mg/L	5 monitoring points near the Project site	Monthly during construction season 2026 and 2027	Maximum Permissible Limits of Soil Pollutants – MNS 5850:2008; Rehabilitation of Disturbed Land – MNS 5914:2008	Laboratory analysis cost × 10	Laboratory analysis cost × 10	The Contractor shall engage a qualified professional entity and use an accredited laboratory.	CSC and IPIU
Vegetation: Species composition, cover, biomass, abundance	2 monitoring points near the Project site	Once per year	General Requirements for Determining Soil Erosion, Land Degradation, and Vegetation Disturbance on Pastureland – MNS 5546:2004	Measurement cost × 2	Measurement cost × 2	The Contractor shall engage a qualified professional entity.	CSC and IPIU
Fauna: Species, abundance, distribution, density, ecological connectivity area, habitat location	Wildlife migration corridors, ecological connectivity areas, and high-density areas, particularly near drinking water sources and watering points	Wildlife monitoring surveys to be conducted	Field wildlife surveys; collection of information on animal distribution from local residents and workers; questionnaire surveys	Measurement cost × 1	Measurement cost × 1	The Contractor shall engage a qualified professional entity.	CSC and IPIU
Waste management	Management of workers' solid and liquid waste	Twice per year, in spring and autumn	Review of completed work records, site observations, mapping documents; collection of	Measurement cost × 2	Measurement cost × 2	The Contractor shall engage a qualified professional entity.	CSC and IPIU

			information and survey feedback on waste from workers and local households				
Workers' labor conditions: percentage of workers with written contracts (target: 100%); timely payment of wages; presence of workers under 18 (target: 0); cases of confiscated identification documents (target: 0); proportion of local workers (target: ≥30%)	Camp, worksite, Contractor's HR records	Monthly; inspections in the event of incidents	Employment contracts, payroll records, age verification documents; IPIU labor inspections; [ESS2; Article 7 of the Labor Law of Mongolia]	Covered under operational cost	Covered under operational cost	The Contractor shall submit monthly reports, reviewed by the Supervising Engineer, to the IPIU.	IPIU Social Specialist; World Bank
Occupational Health and Safety (OHS): number of lost-time injuries (LTI) (target: 0); number of near misses; compliance with PPE requirements (target: ≥95%); percentage of workers undergoing pre-employment medical examinations (target: 100%); percentage of	All work sites and camps	Daily (OHS records); monthly consolidation; incident-based reporting; spot checks	Daily OHS records, incident/accident reports, PPE inspection records	Covered under operational cost	Covered under operational cost	The Contractor's OHS Specialist shall submit monthly reports, reviewed by the Supervising Engineer, to the IPIU.	IPIU Social Specialist; World Bank

workers receiving OHS training (target: 100%)							
Worker Grievance Mechanism (WGM): number of grievances received, disaggregated by sex; percentage resolved within 10 working days (target: ≥90%); ratio of closed grievances to total grievances; SEA/SH grievances maintained in a separate register (target: immediate action)	Camp; Contractor's WGM records	Monthly; SEA/SH cases within 24 hours	Standard grievance form; WGM logbook and electronic archive	Covered under operational cost	Covered under operational cost	The Contractor shall submit monthly reports, reviewed by the Supervising Engineer, to the IPIU.	IPIU Social Specialist; World Bank
Code of Conduct (CoC) and SEA/SH training: percentage of workers who have signed the CoC (target: 100%); percentage of workers trained on SEA/SH prevention (target: 100%); refresher SEA/SH training once per quarter; appointment of a female GRM /	Camp; Contractor's records	Training before commencement of works and once per quarter	Training attendance records; CoC signature sheets	Covered under operational cost	Covered under operational cost	The Contractor shall submit quarterly reports, reviewed by the Supervising Engineer, to the IPIU.	IPIU Social Specialist; World Bank

SEA/SH focal specialist							
Road traffic safety during construction: number of traffic accidents within the work zone (target: 0); compliance with the Traffic Management Plan, including completeness of road signs and barriers (%); compliance of heavy vehicles with speed limits (%); adequacy of traffic controllers on duty	All work sections and locations specified in the Traffic Management Plan	Weekly inspections; incident-based reporting	Supervision Engineer's Traffic Management Plan inspection records; accident reports; compliance with the Law on Road Traffic Safety of Mongolia	Covered under operational cost	Covered under operational cost	Contractor (OHS + Traffic Controller) shall submit weekly reports through the Supervising Engineer to the IPIU.	IPIU Social Specialist; World Bank
SEA/SH monitoring: pre-construction baseline information – SEA/SH complaints registered with law enforcement (5 cases in 2024 across 6 soums, as baseline); number of SEA/SH complaints received through the GRM during construction;	Baseline: police records from 2 soums; during construction: confidential GRM channel	Baseline before works begin; monthly during construction (consolidated)	Confidential GRM records; police complaint reports for baseline information	Covered under operational cost	Covered under operational cost	Upon receipt of an SEA/SH case through the GRM, the Contractor shall immediately connect the case with the relevant support services, notify the IPIU within 24 hours, and record the case; monthly reporting shall include only aggregated numbers.	IPIU Social Specialist; the World Bank shall be notified within 24 hours

percentage receiving response action within 24 hours (target: 100%); appointment of a female GRM focal point; existence of referral links to survivor support services							
Emergency access: whether ambulances are able to pass freely; whether notice of road closure has been given at least 14 days in advance (%)	All work sections and road closure points	Weekly inspections; each time a road closure occurs	Traffic Management Plan inspection records; public notice records (SMS, printed notices)	Covered under operational cost	Covered under operational cost	Contractor (OHS + Traffic Controller) shall submit weekly reports through the Supervising Engineer to the IPIU.	IPIU
Implementation of the SEP – stakeholder meetings: number of meetings conducted compared to SEP schedule (target: at least 1 meeting per soum per month); total number of participants disaggregated by sex (target: ≥20% women); number of publicly disclosed documents (e.g.,	2 soums; worksite information boards; roadside stopping points; service centers; public congregation points	Monthly meetings; notices issued 14 days before road closures	Meeting minutes; participant lists disaggregated by sex; photo evidence of notices	Covered under operational cost	Covered under operational cost	Contractor (OHS + Local Liaison Specialist) shall submit monthly reports, reviewed by the Supervising Engineer, to the IPIU.	IPIU Social Specialist

ESMP summary, GRM information)							
Community GRM: total number of grievances received per month, disaggregated by sex and category; percentage acknowledged within 2 working days (target: 100%); percentage resolved within 7 working days for low-risk grievances (target: ≥90%); number unresolved for more than 30 days (target: 0); level of awareness of the GRM among households in the Project area of influence	Camp, work office, grievance boxes in 2 soums	Boxes checked weekly; monthly reporting; quarterly consolidation	Standard grievance form; consolidated GRM register; grievance closure signature sheet	Covered under operational cost	Covered under operational cost	Contractor shall submit monthly reports through the Supervising Engineer to the IPIU.	IPIU Social Specialist; World Bank (GRS)
Monitoring of vulnerable group engagement: number of registered vulnerable households compared to official registration figures; percentage of	Vulnerable households in the bags crossed by the Project road alignment, including other identified bags, through	Local liaison contact monthly; registration updated quarterly	Communication log; vulnerable group register	Covered under operational cost	Covered under operational cost	Contractor shall submit quarterly reports, reviewed by the Supervising Engineer, to the IPIU.	IPIU Social Specialist; Soum Social Worker

registered vulnerable households contacted each quarter (target: ≥80%); percentage of women participating in separate consultation meetings	the soum social worker						
Stakeholder satisfaction	Contractor organization / Project area stakeholders	Once per year	Within the framework of regular monitoring	–	–	Project Management Unit (IPIU), Local Government	CSC and IPIU
Incident monitoring (wildlife and livestock collision)	Project construction site	Each time an incident occurs	Monitor each accident and risk event, determine the risk, and implement protective measures	–	–	Contractor, Project Management Unit (IPIU)	CSC and IPIU

Table 67. Environmental Monitoring Plan

During Project Operation Phase Monitoring

Monitoring Indicator	Location	Frequency / Timing	Applicable Methodology / Standard	2028	2029	2030	Implementing Entity	Supervising / Oversight Entity
Air: Dust (μg/m³), CO (μg/m³), SO_2 (μg/m³), NO_2 (μg/m³)	5 monitoring points near the Project site	Once per quarter	Air Quality – MNS 4585:2025, General Technical Requirements for Permissible Limits of	Measurement cost × 4 times × 5 points	Measurement cost × 4 times × 5 points	Measurement cost × 4 times × 5 points	The Contractor shall engage a qualified professional entity.	Province Department of Environment, State Environmental Inspector, MRT, Road Maintenance Authority (ROAD

			Pollutants in Ambient Air; MNS 5885:2008					REPAIR AND MAINTENANCE)
Noise: Maximum level, dBA	5 monitoring points near the Project site	Once per quarter	MNS 4585:2025, as cited in the source text	Measurement cost × 4 times × 5 points	Measurement cost × 4 times × 5 points	Measurement cost × 4 times × 5 points	The Contractor shall engage a qualified professional entity.	Province Department of Environment, State Environmental Inspector, MRT, Road Maintenance Authority (ROAD REPAIR AND MAINTENANCE)
Water: Hydrochemical parameters (mg/L); physical parameters, including temperature (°C); biological contamination indicators; heavy metals: Arsenic (As), Lead (Pb), Zinc (Zn), Cadmium (Cd), Iron (Fe), Copper (Cu)	Tarna River and 2 nearby herders' wells, total 3 points	Once per quarter	Water Environment Quality – MNS 4586:2024; Hygiene Requirements for Drinking Water for Protection of Environment and Public Health – MNS 0900:2018	Laboratory analysis cost × 4 times × 3 points	Laboratory analysis cost × 4 times × 3 points	Laboratory analysis cost × 4 times × 3 points	The Contractor shall engage a qualified professional entity and use an accredited laboratory.	Province Department of Environment, State Environmental Inspector, MRT, Road Maintenance Authority (ROAD REPAIR AND MAINTENANCE)
Soil: Mechanical composition	5 monitoring points near	Once per quarter	Maximum Permissible Limits of Soil	Measurement cost × 4	Measurement cost × 4	Measurement cost × 4	The Contractor shall engage	Province Department of Environment,

and physical properties of soil; agrochemical properties; heavy metals: Arsenic (As), Lead (Pb), Zinc (Zn), Cadmium (Cd), Iron (Fe), mg/L	the Project site		Pollutants – MNS 5850:2008; Rehabilitation of Disturbed Land – MNS 5914:2008	times × 5 points	times × 5 points	times × 5 points	a qualified professional entity and use an accredited laboratory.	State Environmental Inspector, MRT, Road Maintenance Authority (ROAD REPAIR AND MAINTENANCE)
Vegetation: Species composition, vegetation cover, biomass	Rehabilitated areas	Once per year	General Requirements for Determining Soil Erosion, Land Degradation, and Vegetation Disturbance on Pastureland – MNS 5546:2004	Measurement cost	Measurement cost	Measurement cost	The Contractor shall engage a qualified professional entity.	Province Department of Environment, State Environmental Inspector, MRT, Road Maintenance Authority (ROAD REPAIR AND MAINTENANCE)
Fauna: Species, abundance, distribution, location of occurrence	Wildlife monitoring survey areas	In 2030	Field survey, observation, local information	–	–	Survey cost	The Contractor shall engage a qualified professional entity.	Province Department of Environment, State Environmental Inspector, MRT, Road Maintenance Authority (ROAD REPAIR AND MAINTENANCE)

Waste management	All land areas and sites used under the Project	During the first year	Document review, site inspection, survey	Management of construction waste and domestic solid waste generated during road construction in accordance with the waste management plan	–	–	Contractor	Province Department of Environment, State Environmental Inspector, MRT, Road Maintenance Authority (ROAD REPAIR AND MAINTENANCE)
Evaluation of the grievance redress mechanism	To be determined	Once per year	Register review and analysis	Covered under operational cost	–	–	Supervising Engineer	Province Department of Environment, State Environmental Inspector, MRT, Road Maintenance Authority (ROAD REPAIR AND MAINTENANCE)
Stakeholder satisfaction	Project area of influence	Once per year	Survey, questionnaire	Covered under operational cost	–	–	Supervising Engineer	Province Department of Environment, State Environmental Inspector, MRT, Road Maintenance Authority (road repair and maintenance)

Incident monitoring	Rehabilitated road alignment	As incidents occur	Monitoring of each accident and risk event	Covered under operational cost	–	–	Supervising Engineer	Province Department of Environment, State Environmental Inspector, MRT, Road Maintenance Authority (road repair and maintenance)