IPPF SIW - Mongolia: Ulaanbaatar to Darkhan Road Environmental and Social Assessment (ESA)

Supplementary document: Environmental and Social Management and Monitoring Plan (ESMMP)

July 2019

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Contents

Tables

Figures

Acronyms and abbreviations

Acronym / Abbreviation	Description
ADB	Asian Development Bank
AH	Asian Highway
AoI	Area of Influence
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
DEIA	Detailed Environmental Impact Assessment
	Environmental and Social Assessment
ESAP	Environmental and Social Action Plan
ESHS	Environmental, Social, Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMMP	Environmental and Social Management and Monitoring Plan
GEIA	General Environmental Impact Assessment
GIP	Good International Practice
ILO	International Labour Organisation
LARF	Land Acquisition and Resettlement Framework
LARP	Land Acquisition and Resettlement Plan
MCPC	Mongolian Construction Project Consultants Group LLC
MET	Ministry of Environment and Tourism
MNS	Mongolian National Standard
MRTD	Ministry of Road and Transport Development
MSW	Municipal Solid Waste
NSR	Noise Sensitive Receptor
O&M	Operation and Maintenance
PIU	Project Implementation Unit
PM	Particulate Matter
PPE	Personal Protective Equipment
PR	Performance Requirement
RTA	Road Traffic Accident
SEP	Stakeholder Engagement Plan
Soum	*Mongolian* Eng. District

1. Introduction

1.1. Background

The European Bank for Reconstruction and Development (EBRD) is considering providing finance to the Government of Mongolia, though the Ministry of Road and Transport Development (MRTD), for the widening of the Ulaanbaatar to Darkhan Road [Asian Highway 3 (AH-3)]. The road currently exists as a 202.42 km, 2-lane, category IV road of improved surface from the capital city, Ulaanbaatar, to the second largest city in Mongolia, Darkhan. The widening project forms Phase II of road reconstruction works and comprises the widening of the road to a category I, 2-way, 4-lane road (referred to as the Phase II Project or the Project throughout). Phase I works are being funded by an Asian Development Bank (ADB) loan and comprise the reconstruction of the existing road (2-lane) (referred to as the Phase I works or ADB project throughout).

The Project has been divided into five lots or sections; further details are provided in Section 2. The MRTD will be responsible for the overall construction and operation of the Project. During construction, the MRTD will be supported by a Project Implementation Unit (PIU) who will assist in the management of the Construction Contractors. The MRTD will be responsible for the operation stage, with the use of operation and maintenance (O&M) contractors as required.

This Project is classed as a Category A project, which means that a comprehensive Environmental and Social Assessment (ESA) of the Project must be undertaken, including a gap analysis of the local Detailed Environmental Impact Assessment (DEIA) and the provision of supplementary documents where necessary to meet the EBRD's 2014 Environmental and Social Policy (ESP) and Performance Requirements (PRs). This Environmental and Social Management and Monitoring Plan (ESMMP) is one of a number of ESA supplementary documents provided in order to meet the ESP and PRs, as follows:

- Supplementary Environmental and Social Impact Assessment (ESIA);
- Non-Technical Summary (NTS);
- Stakeholder Engagement Plan (SEP);
- Land Acquisition and Resettlement Framework (LARF); and
- Environmental and Social Action Plan (ESAP).

1.2. Objectives

The key objective of this ESMMP is to ensure compliance of the Project with the EBRD's 2014 ESP and PRs and Mongolian environmental and social standards in managing identified environmental and social risks and impacts of the Project at each stage, i.e. during pre-construction, construction/post-construction handover and operation.

The specific objectives of the ESMMP are:

- To ensure that mitigation measures identified in the DEIA and Supplementary ESIA that need to be developed within the overall Project Environmental, Social, Health and Safety system (ESHS) are set out for each stage of the Project;
- To set out measures for monitoring that need to be developed within the Project ESHS;
- To ensure that a Project ESMMP and detailed Lot-specific Construction ESMMPs will be developed and operated according the EBRD PRs, European Union (EU) Environmental Impact Assessment (EIA)[1] and Birds Directive[2] and Mongolian legislation and standards;
- To ensure that the roles and responsibilities in relation to implementation of mitigation and monitoring measures are identified; and

[1] EU Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by 2014/52/EU (the EIA Directive).
[2] EU Directive on the conservation of wild birds (2009/147/EC).

- To propose measures for compliance monitoring of the implementation of the Project and Lot-specific Construction ESMMP.

1.3. Scope

This Supplementary ESMMP identifies:

- Necessary mitigation measures and management actions;
- Environmental monitoring requirements; and
- Auditing, monitoring and reporting procedures; and
- Roles and responsibilities in respect of management, monitoring and compliance.

It covers Project-related construction activities at Project sites, including construction camps, quarries and, if used, haul routes; and the operation of the road.

This document should be read in conjunction with the DEIA and Project Supplementary ESIA, ESAP, SEP and LARF.

1.4. Intended Users

The aim of this ESMMP is to communicate to Project personnel the potential environmental and social issues associated with the Project and the mitigation measures and monitoring requirements that are required to be implemented during construction and operation of the Project. Its requirements are applicable to all Project personnel, including the MRTD and the PIU, Design Consultants, Construction contractors, Subcontractors, site visitors and/or O&M contractors.

The MRTD/PIU and the Construction contractors will use this Supplementary ESMMP to develop more detailed managements plans that will achieve effective environmental and social management during the construction and operation phases of the Project.

1.5. Change Control

This ESMMP has been prepared as part of the ESA process to meet EBRD ESP and PRs. It will form part of the tender documentation for Construction contractors.

This ESMMP document will be updated prior to construction as part of the development of the Project ESHS by the MRTD/PIU to reflect final design and the results of additional survey work required pre-construction (the Project ESMMP).

Each Construction contractor will be required to follow the overarching Project ESMMP and prepare detailed Lot-specific Construction ESMMPs for their lots, for approval by the MRTD/PIU (the Lot-specific Construction ESMMP).

During construction, amendments may be required if any major changes occur to the Project's design, performance, environmental and social conditions or resulting from incidents or accidents. The process of Change Management will be the ultimate responsibility of each Construction contractor and reviewed by the MRTD/PIU.

At least three months prior to the operation phase, the O&M ESMMP shall be finalised by the MRTD/PIU (O&M ESMMP). This will be implemented by the MRTD and all O&M contactors will be expected to follow the O&M ESMMP.

2. Project Description

2.1. Introduction

The Government sponsored a feasibility study (the 'Feasibility Study') for rehabilitation of the existing 2-lane road prepared by Mongolian Construction Project Consultants Group LLC (MCPC) which was issued in 2017. The Feasibility Study argues in favour of rehabilitation and expansion of the existing 2-lane road to a 4-lane road based on a technical, socio-economic and environmental analysis. The project has been split into two phases:

- Phase I - rehabilitation of the existing road; and
- Phase II - capacity expansion via construction of a further 2-lane road.

Phase I is being financed by the ADB and covers reconstruction of the 2-lane road, including smoothing of dangerous sections of roads and an extension of around 3 m of the existing road where necessary to meet road class standards. A PIU has been set up within the MRTD to deliver the Phase I and Phase II works.

2.2. Project Overview

The route of the Project is shown in Figure 2-1. The Phase II Project that the EBRD proposes to fund has been divided into five sections or "lots" as described in Table 2-1. The Project road starts from the roundabout junction of Darkhan-Emeelt outside Ulaanbaatar and passes through three aimags and six soums (smaller administrative than an aimag), as follows: the soums of Bayanchandmani, Jargalant, Bornuur and Sumber in Tuv Province (aimag), Bayangol soum in Selenge Province, and Khongor soum in Darkhan-Uul Province, finishing in the south of Darkhan City in Darkhan-Uul Province.

Table 2-1. Project sections

Section / Lot	Description	Length (m)	Project Chainage-From m	Project Chainage-To m	KM Post From	KM Post To
I	Starting at roundabout junction of Darkhan-Emeelt to north of Khar Modot Pass (52nd pass)	37,281.77	0	37,281.77	18.9	56.18
II	North of Khar Modot Pass to south of Tais Pass	45,500.17	37,281.77	82,781.94	56.18	101.68
III	Vicinity of Urikhan diner to road junction of Sumber soum, Tuv Province or Bor Tolgoi	45,753.06	82,781.94	128,535.00	101.68	147.44
IV	Bor Tolgoi or road junction of Sumber soum, Tuv Province to Tsaidam Valley	45,050.56	128,535.00	173,585.56	147.44	192.49
V	Tsaidam Valley to roundabout junction in Darkhan	28,840.00	173,585.56	202,425.56	192.49	221.33

Source: MCPC (21 May 2019), Engineering Explanatory Report – Part 1.

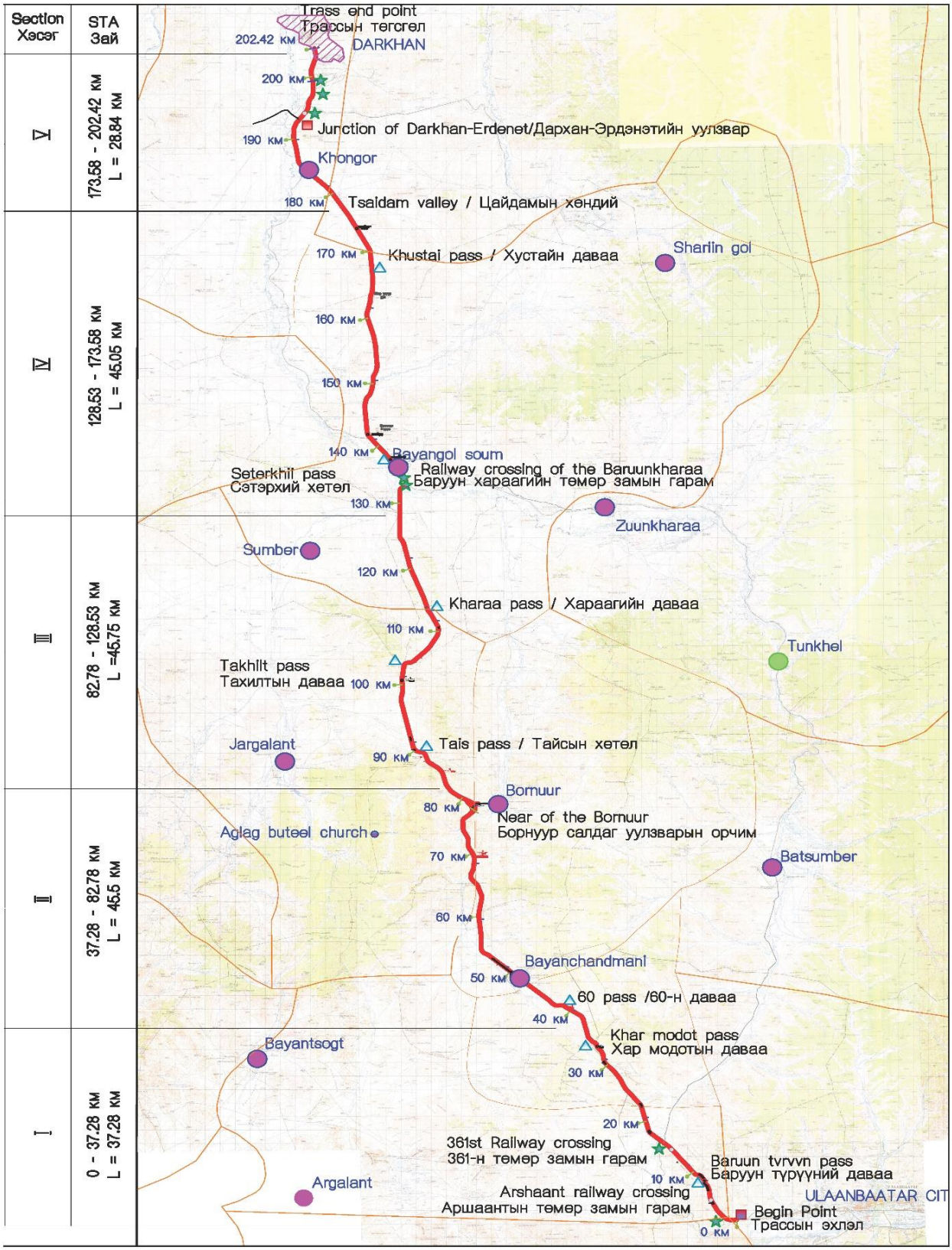


Figure 2-1. Project road location

Source: MCPC (21 May 2019). Engineering Explanatory Report – Part 1.

2.3. Existing Road Features

2.3.1. Intersections

There are ten main intersections and crossings with existing roads, as shown in Table 2-2. There are two tolls on the road, one at the Project start (an operational MRTD toll) and at the Darkhan-Erdenent intersection.

Table 2-2. Project intersections and crossings with existing roads

Section / Lot	No.	Chainage	East	West
I	1	14+920		Road to Batsumber Soum of Tuv province
	2	15+903	Road to Khui 7 Khudag, Naamad Complex	
II	3	36+270.2	Road to Aglag Buteel temple	
	4	40+795.4		Road to Bornuur Soum of Tuv province
III	5	10+676	Road to Jargalant Soum of Tuv Province	
	6	27+840		Road to Mandal Soum of Selenge Province
	7	45+580	Road to Sumber Soum of Tuv Province	
IV	8	3+280		Road to Mandal Soum of Selenge Province
	9	29+660		Road to Shariin Gol Soum of Darkhan-Uul Province
v	10	19+327.38	Erdenet-Bulgan Road	

Source: MCPC (21 May 2019). Engineering Explanatory Report – Part 1.

2.3.2. Bridges

The road currently has a number of reinforced concrete bridges; the largest of these is across the River Kharaa. There are also 229 reinforced concrete culverts of three different types, which are pipe, oval and box. Locations of the main existing bridges[3] are listed below:

- Doloon Khudgiin Gol Bridge;
- Ikh Bulag Bridge;
- Dariganatiin Gol Bridge;
- Shariin Gol Bridge;
- Saikhanii Gol Bridge;
- Shivertiin Gol Bridge;
- Shavartiin Gol Bridge;
- Kharaa Gol Bridge; and
- Bayan Gol Bridge.

2.3.3. Railways

The existing road has eight railway crossings. These intersections are currently being crossed at grade. Four intersections are classified as controlled and four as uncontrolled, as reported in Table 2-3.

[3] Phase II construction detailed engineering design. Design revision for expansion of route UB-Darkhan, p.143

Table 2-3. Location of railway crossings

Section	Crossing No.	Name of roadway and railway crossings	Chainage (km)	Grade	Note
I	1	384th crossing in Khoroo 21 of Songinokhairkhan District	1+514.72	II	Controlled crossing
	2	361st crossing in Khoroo 21, Songinokhairkhan District	15+809.14	II	Controlled crossing
IV	3	Baruunkharaa railroad crossing, Bayangol Soum	4+636.9	II	Controlled crossing
	4	Crossing of branch railroad to railway maintenance centre	5+942.31	II	Uncontrolled crossing
	5	National Emergency Management Agency's Branch Railway, Bayangol Soum.	5+948.13	IV	Uncontrolled crossing
V	6	Sharin Gol railroad crossing	21+900.5	III	Controlled crossing
	7	Railroad crossing of cement plant of "Erel" LLC	24+851	IV	Uncontrolled crossing
	8	Railroad crossing to Darkhan Thermal Power Plant	25+772.1	IV	Uncontrolled crossing

Source: MCPC (21 May 2019), Engineering Explanatory Report – Part 1.

2.4. Proposed Works

The Project will comprise construction of a new road, including roundabouts, U-turns and stopping areas; provision of road furniture (barriers, lights, etc.); construction of crossings over eight railways; construction and rehabilitation of bridges and culverts; and rehabilitation of toll booths. The road will be widened both on-line and off-line, with approximately 68 km to be widened adjacent the existing road and the remaining 134 km to be offline from the existing road by approximately 16-18 m from the centreline of the existing road.

The new road design is based on a category I standard of road in accordance with Mongolian standard: *CNR 22-004-2016 Highway Design Standard*. Pavement calculations were made on the basis of the available materials, using the *INDOR PAVEMENT 9* programme. An asphalt concrete pavement structure is proposed.

Traffic control measures will be put in place complying with the applicable Mongolian standards and international practice.

A number of structures will be required as follows:

- Section I - 37.28 km, from roundabout junction for Darkhan and Western aimags to north of Khar Modot (52nd pass) Pass - 2 bridges, 50 culverts; 14 of which are for animal and typical sedan crossings.
- Section II - 45.49 km from north of Khar Modot Pass to south of Tais Pass - runoff capacity of bridges and culverts has been estimated and existing dimensions of most have been modified (expanded) in the design. Works comprise 5 bridges, 66 culverts, of which 26 are for animal and typical sedan crossings. This section of project road traverses through centre of Bayanchandmani Soum of Tuv aimag and minor rivers of Darigant, Shariin Gol, Saikhan, Shivert and Shavart.
- Section III - 45.75 km from the vicinity of Urikhan diner to road junction of Sumber Soum, Tuv aimag or Bor Tolgoi - 64 box and pipe culverts are designed for this section, 8 of them for animal and typical sedan crossing. The section goes through Tais, Takhilt and Kharaa Passes.
- Section IV – 45.06 km from Bor Tolgoi or road junction of Sumber Soum, Tuv aimag to Tsaidam Valley. Works comprise 44 box and pipe culverts and 2 bridges. Animal and human crossings are proposed at 13 points. This section traverses the centre of Bayangol Soum, Selenge aimag, and crosses the Kharaa and Bayan Rivers.
- Section V - 28.84 km from Tsaidam Valley to roundabout junction in Darkhan. Works comprise a total of 34 drainage culverts. Animal and human crossings are proposed at 16 points.

2.5. Construction Phase

No specific details are available of the workforce or equipment required during the construction phase, as this will be determined by the contractors. However, typical site installation and preparatory work for road projects includes:

- Development of the lay down areas, work sites and construction camps;
- Mobilisation and installation of the crushing and concrete plant;
- Mobilisation of supplies and materials necessary for construction (vehicles, trucks, construction equipment);
- Temporary signage and the setting up of deviations where necessary;
- General cleaning, clearing and cutting of trees where necessary; and
- Installation of drainage.

Earthworks will include cutting and/or embankments, however, at this stage it is yet to be determined if all earthworks will be undertaken under the Phase I works to avoid two stages of earthworks.

The temporary road required during construction works on the existing road will be the responsibility of the Phase I project. It is currently considered that no additional temporary roads (or use of the Phase I temporary roads) will be required by the Phase II Project. Haul roads may be required by Construction contractors in the Phase II (EBRD) works, however it is likely that contractors will use the Phase II road footprint as their haul roads. This will be confirmed once contractors are commissioned.

The types of equipment that will be required includes:

- Bulldozers
- Graders
- Dump trucks
- Mechanical shovels on wheels or on track
- Finisher
- Sweeper
- Pneumatic compactors
- Cylinder compactors
- Water tanks
- Fuel tanks
- Planers / milling machines
- Loaders
- Concrete mixer
- Generators
- Mobile crane
- Mixer trucks
- Pumps
- Vibrating plate
- Compressors
- Circular saw
- Painting equipment

During construction raw materials will be required for the road pavement, including sand, concrete, bitumen and aggregate and water, most of which will be sourced from Mongolia. There are 17 borrow pits along the road, as shown in Figure 2-2. The DEIA[4] identifies that 11 of these sites will be used by the contractors.

[4] SEC (May 2019), Detailed Environmental Impact Assessment.

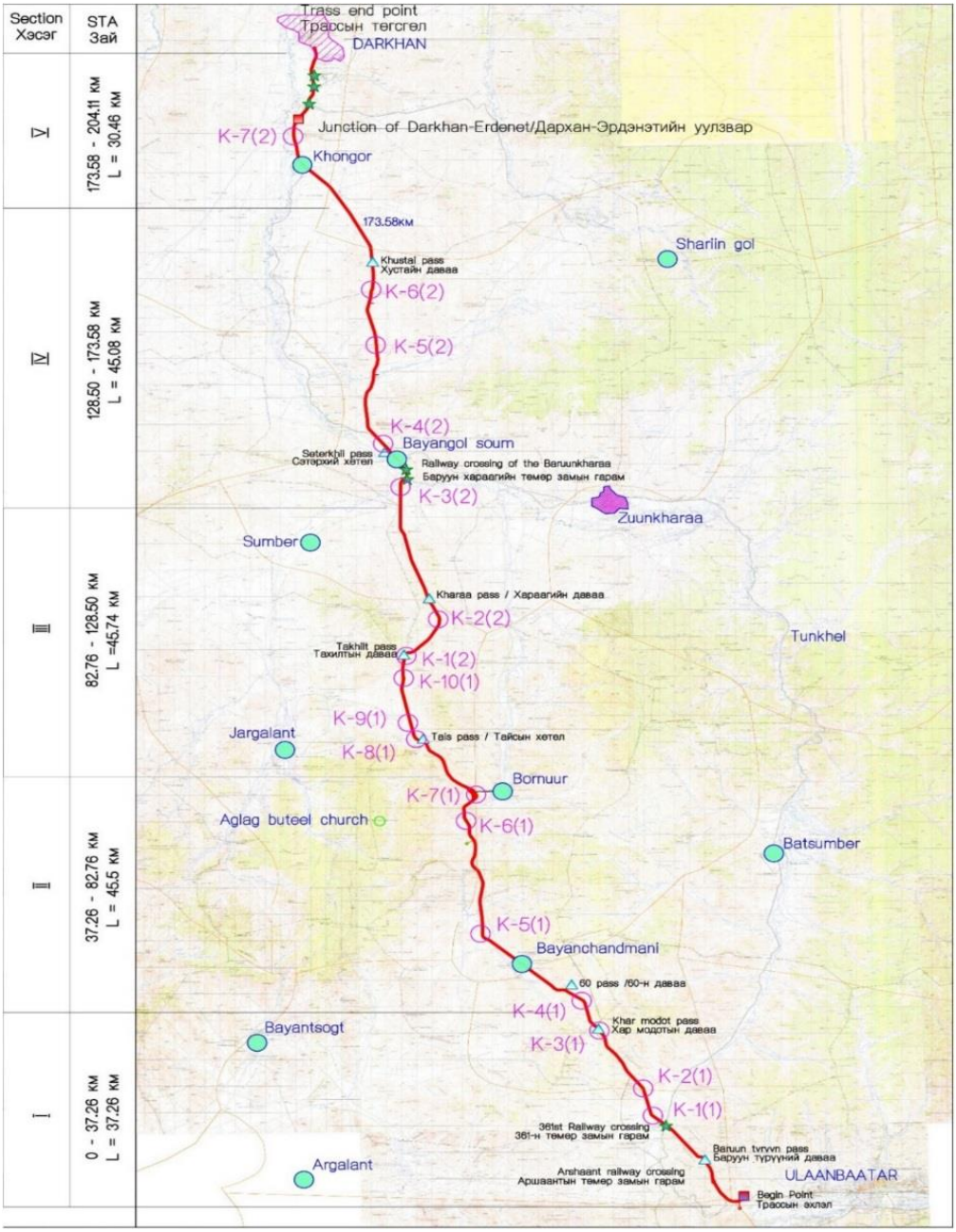


Figure 2-2. Existing borrow pits along the road

Source: MCPC (21 May 2019). Engineering Explanatory Report – Part 1.

2.6. Operation Phase

2.6.1.1. Road design life

The road has been designed for a 20 year lifespan.

2.6.1.2. Toll booths

There will be two MRTD toll booths on the road, at the exit from Ulaanbaatar city (an existing operational toll) and at the Darkhan-Erdenet intersection. Tolls are not applicable under Mongolian Law for local travel.

2.6.1.3. Road speeds

The design speed of the road is set out in Table 2-4. The design speed is 100 km/hour for almost 70% of the road, with 80 km/hour adopted for difficult sections of Baruunturuu, Khar modot and Takhilt passes. The current speed limit is 80 km/h - though it is noted that this limit is not currently observed. Speed limits will be reduced in

urban areas to 60 km/h. Two speed cameras and five video surveillance cameras linked to traffic monitoring centres are currently proposed.

Table 2-4. Design road speeds

Parameters	Unit of Measurement	"Design of Roads" 32-01-07	Existing Road Parameters	Applicable standard for further design: "Design of Roads" 22-004-2016
Design speed • Level terrain • Rolling terrain • Mountainous	km/hour	 80 60 40	80	 100 90 80

Source: MCPC (21 May 2019). Engineering Explanatory Report – Part 1.

2.6.1.4. Operation and maintenance

No details are currently available on O&M activities however, these typically include routine maintenance and unplanned maintenance such as clearing the road and repairing potholes.

3. Legislation

3.1. Introduction

This section outlines the relevant national environmental and social legislation and standards and EBRD PRs with which the ESMMP complies.

3.2. Mongolian National Legislation

3.2.1. Government

Mongolia is a parliamentary republic. It is a unitary state which means the central government is supreme and any administrative divisions (sub-national units) exercise only those powers which the central government delegates.

There are four levels of government in Mongolia including the State Great Khural. The highest level of sub-national government is the province (*aimag*) and the capital city, Ulaanbaatar. Provinces are divided into regions (*soum*), and Ulaanbaatar is divided into districts. The lowest tier consists of communities, of two types: rural sub-districts (*baghs*) and urban sub-districts (*khoroos*).

The 1992 Constitution organises administrative units of Mongolia on the basis of self-governance and state management, each unit having its own Governor and Assembly (*Khural*). The Governor is the local representative of the central or higher levels of sub-national government, whereas the Assembly is elected by the lower assemblies.

3.2.2. Mongolian Laws

Key Mongolian laws dealing with the environmental protection, biodiversity, environmental impact assessment, hazardous materials, health and safety and cultural heritage are summarised in Table 3-1.

Table 3-1. Key environmental and social laws of Mongolia

Name of the law	Year of adoption/ amendment	Overview
Environmental Protection		
The Constitution of Mongolia	1992	The Constitution of Mongolia provides general principles of environmental protection. It also identifies the governance system and sets out the roles and responsibilities. Under the Mongolian Constitution all land, subsoil, natural resources and water are the property of the State.
Law on Environmental Protection	1995/2012	The law sets out principles and requirements on environmental protection, including Environmental Impact Assessments (Article 9), environmental monitoring (Article 10), general methods and forms of environmental protection (Article 19), and restoration of natural resources (Article 25).
Law of Soil Protection and Prevention from Desertification	2012	This framework law sets out measures to regulate soil protection and prevent desertification. It contains measures aimed to prevent desertification caused by road construction.
Law on Water	2012	The purpose of the law is to govern relations concerning the protection and rational use and restoration of water resources and its basin. The law contains requirements on the activities that shall be prohibited in the hygienic sanitation zone, i.e. to construct buildings and installations of equipment for purposes other than direct mining; to dispose of waste and chemicals.
Law on Forest	1995/2012	This law regulates the protection of forests, the proper utilization and regeneration of forests. According to Article 4 the forest fund is divided into the three categories depending on its ecological and economic importance, i.e. special forest zones, protected forest zones, and industrial forest zones. Chapters 2-4 sets out forest protection regimes for these categories of forests.
Law on Protection of Plants	1996/2007	Mentioned above Law on Natural Plants is accompanied by the Law on Protection of Plants. This law regulates the fee requirements for the use of natural plants by citizens, economic entities, and organisations.
Law on Minerals	2006	The purpose of the minerals law is to regulate the exploration and mining of minerals and the protection of mining areas and their surroundings. Minerals are

Name of the law	Year of adoption/ amendment	Overview
		defined as '*naturally occurring mineral concentrations formed on the surface of land or in the subsoil as a result of a geological evolutionary process*' but do not include oil and natural gas. This may be relevant to any potential new quarries/borrow pits required.
Law on Air	1995/2012	This framework law sets out requirements to protect air quality. As stated in Article 20 if pollution substances are above the established standard, an environmental and hygienic state inspector may limit or suspend activities; it is prohibited to engage in any activities that do not meet the requirements for waste disposal, open burning and waste disposal standards. According to the article 21 it is prohibited to use technology that does not meet the requirements on air protection, use of materials, substances and products, and the use of equipment.
Law on Waste	2003/2017	The purpose of this law is to govern relationships related to collection, transportation, storage, and landfill of household and industrial waste, and reusing of waste as source of raw materials. Requirements on waste disposal, collection, transportation, waste land-fill, and re-using of waste are summarised in Article 11.
Law on Hazardous and Toxic Chemicals	2006	This law addresses the import, export, transportation, storage, use, and control of toxic chemicals. It imposes measures to prevent the impact of toxic and hazardous substances on human health and the environment.
Biodiversity		
Law on Special Protected Areas	1994/2004	This law regulates areas under special protection, preservation and protection of natural landscape. The Law provides for four categories of protected areas: i.e. Strictly Protected Areas, National Conservation Parks, Nature Reserves and Monuments. Nature Reserves are classified into four sub-categories, i.e. Ecological Reserves, Biological Reserves, Paleontological Reserves and Geological Reserves.
Law on Buffer Zones of Protected Areas	1995	The purpose of this Law is to regulate the determination of Special Protected Area Buffer Zones and the activities therein. The Law specifically provides for zones in two categories – Strictly Protected Areas and National Conservation Parks.
Law on Fauna	2000/2012	The purpose of this law is to regulate the protection and breeding of fauna permanently or temporarily residing in the soil, water or on land within Mongolia. Articles 6 and 7 are dealing with methods of protection of fauna and the protection of extremely rare and rare fauna, respectively. Article 7 also contains the list of species that are considered 'extremely rare fauna'. According to Article 7 the construction of roads must be approved by the government based on the conclusions of an environmental impact assessment.
Law on Natural Plants	1995/2015	This law regulates the protection, sustainable use and restoration of natural flora other than forest and cultivated plants. Flora is classified based on reserves and restorative capacity into three categories, i.e. extremely rare ('nen xovor'), rare ("xovor"), and common ("elbeg"). The law contains the list of extremely rare plant species in Latin.
Environmental Impact Assessment		
Law on Environmental Impact Assessment	1998/2002/2012	According to this law (Article 7), an environmental impact assessment consists of General Environmental Impact Assessment, and Detailed Environmental Impact Assessment.
Hazardous Materials		
Law on Toxic and Hazardous Chemicals	2006/2017	The purpose of this Law is to regulate relations concerning the export, import and transportation of toxic chemicals across the border of Mongolia, and production, storage, trade, transport, use, removal and control on thereof. Article 4 sets out classification of toxic chemicals. Chapter two covers requirements for coordination of activities related to hazardous and toxic chemicals, i.e. storage ~(Article 10), transportation (Article 12), use (Article 13).
Cultural Heritage		
Law on Protection of Cultural Heritage	2014/2016	The objective of this law is to regulate relations concerning the search, registration, research, classification, evaluation, preservation, protection, restoration, recreation, transmission, inheritance, ownership, possession, use and promotion of cultural heritage. Article 4 provides categorization of cultural heritage. Articles 5-7 contains the list of immovable historical and cultural memorials, movable historical memorial objects, and intangible cultural heritage, respectively.

Name of the law	Year of adoption/ amendment	Overview
		Health and Safety
Law on Occupational Health and Safety	2008	The purpose of this law include determination the state policy and principles on labour safety and hygiene, to ensure fulfilment of requirements and standards for labour safety and hygiene at workplace, and to create safe and hygienic work environment. Chapter 2 is dealing with requirements and standards of labour safety and hygiene, including those with respect to machinery and equipment (Article 9), for machineries for lifting, delivering and transportation (Article 10), requirements with respect to toxic and dangerous chemical substances (Article 12), fire safety requirements (Article 13), medical check-ups (Article 14), PPE (Article 15) and training (Article 17).
Law on Hygiene	2016	The law warrants the Constitutional right of a citizen to live in healthy and safe environment. Organisations and employers shall have the following duties according to this law: demand employees and customers comply with hygiene legislations; impose a penalty on employees who are in breach of hygiene legislations; comply with orders issued by a competent official or an authority with respect to standards and legislation on hygiene and take necessary actions to eliminate the offences and to respond; comply with norms and requirements of labor safety and hygiene during all stages of activities; keep the public road free of garbage, puddle, snow or ice; prevent infectious and non-infectious diseases, occupational disease, industrial accident and injuries; undertake medical exam and screening of employees; and employ a person who is in charge of labor safety and hygiene in accordance with rules adapted by State Central administrative authority in charge of Health and Labor related matters if the organization and legal entity in production and service business employs 50 people or more. If the organization in manufacturing and service business employs 50 people or less, it may employ the personnel on the basis of a contract.
		Land Use and Tenure
Land Law	2002/2012	The purpose of this law is to regulate possession and use of state-owned land and other related issues. Land includes the surface of land and airspace above but not minerals; To 'own' land means to have control over land and a right to dispose of it; To 'possess' land means to have control over land in accordance with a contract that sets out the permitted use and other terms of possession; To 'use land' means the right to use land in accordance with a contract granted by those who 'own' or 'possess' the land; and A 'certificate of land use' means a certificate granting the right to use land to foreign entities. According to this law land possessors and users shall comply with the requirements for efficient and rational land use and protection (Article 50). Pastureland is owned by the state and operated under a common tenure system. The Law on Land also addresses land use planning and expropriation. The State Central Administrative Organisation has the power to implement legislation and policy on land use and to determine land use classifications subject to government approval. Resolution 143 (1995) gives local aimag and soum-level governments primary responsibility for implementation of the Land Law. Citizens' Representatives Khurals and Governors of *Aimags*, the Capital City, *Soums* and districts have powers to: enforce land legislation and ratify general land management plans; take land from citizens for the special needs of aimags, the capital city and soums on submission of such proposals by corresponding level governors; determine the size and boundaries of land to be taken from Citizens and approve the use of such land; and make decisions on granting compensation in respect of land taken.
Civil Code	1994/2002	The Civil provides a legal framework for land acquisition and resettlement. Negotiation is the main basis for the transaction between the State and affected persons. They engage contractually as equal and autonomous legal entity and participate legally in the civil transaction (Article 1). Citizens and organizations, as well as aimags, the capital city, soums and districts can enter into civil legal relations with regard to objects of material and non-material wealth and their acquisition and possession (Articles 6, 7 and 8). Chapter 10 of the Civil Code defines property and assets, including land and other immovable property. Chapter 11 details provisions for their possession by legal acquisition and Chapter 12 for property ownership by individuals and other legal persons. The Civil Code in Article 101 provides general terms for the possession, use and disposal of property (further elaborated in Articles 109 to 112), but refers to the subsequently enacted Land Law and Land Allocation

Name of the law	Year of adoption/ amendment	Overview
		Law regarding land ownership and possession.
Land Allocation Law	2003/2005/08	Compared to the Law on Land, the Land Allocation Law specifies the procedures for land acquisition and the subjects that need to be agreed with the affected persons in more depth. The right of a landowner to dispose of owned land through sale according to relevant procedures" (notarized contract) is guaranteed in Article 27. Possessors, according to Articles 35 and 38 of the Land Law, are also entitled to transfer their possession licenses via a notarized contract but need to seek the approval of the governor of the soum or district. In replacing or taking back Citizen' owned land for the special needs of the state, the owner and state administrative organization/agency in charge of land relations matters shall enter into the preliminary agreement with the possessor.
Law on Subsoil	1988/2015	This law regulates issues related to use and protection of subsoil. According to the Article 10, the subsoil may be given for use for the building and using constructions and structures underground for purposes other than mining.
Auto Road Law	2017	Article 17.2 states that international and national (special purpose roads), and its roadway clearing limits (Article 16.2. 100 m or 50m to each side from the centreline for international, national, and the special purpose roads) are under the possession of the state central organization in charge of auto road issues, or its delegate. Article 29.2 states that users of the auto road are prohibited to run non-road related and business activities within the 100m without a permit by authorized agency.
		Labour Laws
Labour Code	1999	The purpose of this law is to determine the rights and duties of employers and employees including collective agreement, collective bargaining, collective and individual labour disputes, labour conditions, terms and conditions of work, liabilities for breach of the legislation, and to ensure gender equality. Under this law an employee has the right to be provided with labour conditions that comply with health and safety laws and regulations; to receive payment for work done; to holiday; to freely assemble with other employees for the purpose of protecting his/ her rights and legitimate interests including through representative organisations and collective agreements; to strike in certain circumstances; to receive a pension, an entitlement to social insurance and death in service benefits and to other benefits as may be provided in employment and collective agreements. Discrimination in the workplace based on nationality, race, sex, social origin or status, wealth, religion, or ideology is prohibited, but women are prevented from undertaking certain forms of work as set out in separate regulations1. Women with children are protected from discrimination and are entitled to maternity leave. Parents with children under three may take child care leave and employers must re-engage such employees on their return to work. Collective agreements may be concluded within professions or economic sectors and at the region, *soum*, *aimag*, district or capital city level. All such collective agreements must be registered with the applicable regulator. The Labour arbitration court settles collective labour disputes and a court or commission settles individual labour disputes.

3.2.3. Mongolian National Standards (MNS)

Mongolian national standards relevant to the Project are listed in Table 3-2.

Table 3-2. List of Mongolian National Standards (MNS) applicable to the Project

MNS number	Name of Mongolian National Standard (MNS)
MNS 17.5.13. 1980.	Environmental Protection: Rehabilitation of eroded land, terms and definitions
MNS 5914:2008.	Environment. Land reclamation. Terms and definitions
MNS 5915:2008.	Environment classification of land destroyed due to mining activities
MNS 5916:2008.	Environment Requirements for fertile soil removing and its temporary storage during the earth excavation
MNS 5917:2008.	Environment. Reclamation of land destroyed due to mining activities. General technical requirements
MNS 5918:2008.	Environment. Re-vegetation of destroyed land. General technical requirements
MNS 4191:1993.	Environmental protection standard system. Baseline climate parameters of Mongolia
MNS 4585:2016.	Air quality. General technical requirements
MNS 4991:2000.	Occupational safety and health. Requirement for method of determination of toxic substances concentration in the air of working zone
MNS 5885:2008.	Acceptable concentration of air pollutant elements. General technical requirements
MNS 3384:1982.	The general and technical requirements for sampling of air quality test
MNS 6063:2010.	Air quality. Acceptable concentration of pollutant elements for atmospheric air in public area
MNS 5803:2007.	Occupational safety and health. General requirements for lead content in workplace air and the workplace
MNS 3383:1982.	Atmosphere. Terms and definitions of pollutant sources
MNS 17.2.1.01:1978.	Atmosphere. Terms and definitions of pollutant sources generated from internal combustion engine
MNS 3113:1981.	Atmosphere. General requirement for determining air pollutants
MNS 5013:2009.	Petrol engine vehicle – Maximum acceptable level and measuring method of exhaust emission
MNS 5014:2009.	Diesel engine vehicles – Maximum acceptable level and measuring methods of opacity
MNS 5010:2001.	General requirement for measuring dust concentration in the atmosphere of work area
MNS 17.1.1.10:1979.	Water. Water use and protection. Terms and definitions.
MNS 17.1.1.14:1980.	Hydrosphere. Classification of water use. General requirement
MNS 4047:1988.	Hydrosphere. Procedure for monitoring surface water quality
MNS 4586:1998.	Water quality. General requirements
MNS ISO 5667-14:2000.	Guidance on quality assurance of environmental water sampling and handling
MNS ISO 5667-3:1999.	Water quality. Sampling. Part 3: Guidance on processing and storage of samples
MNS 3342:1982.	General requirement for preventing from groundwater pollution
MNS ISO 5667-11:2000.	Water quality. Sampling. Part 4: Guidance on sampling of groundwater
MNS ISO 5667-4:2001.	Environment. Water quality. Part 4: Guidance on sampling from natural and man-made lakes
MNS ISO 5667-6:2001.	Environment. Water quality. Part 6: Guidance on sampling of rivers and streams
MNS 6148:2010.	Water quality. Maximum limit of substance contaminating the ground water
MNS 0900:2005.	Drinking Water. Hygienic requirements, and assessment of quality and safety
MNS ISO 5667-5:2001.	Environment. Water quality. Part 5: Guidance on sampling of drinking water and water for beverage production
MNS 2573:1978.	Hydrosphere. Water quality parameters
MNS 4943:2015.	Water quality. Effluent treated wastewater. General requirements
MNS ISO 5667-10:2001.	Environment. Water quality. Part 4: Guidance on sampling of waste waters
MNS 6230:2010.	Identification of wastewater discharge point. General requirements
MNS 5924:2015.	Pit latrine and sewage pit. Technical requirements
MNS 3474:2003.	Plant protection. Terms and definitions.
MNS 3475:2003.	Plant quarantine. Terms and definitions.
MNS ISO 11269-1:2002.	Soil quality. Methods to determine effects of the plant pollutants in soil. Part 1: Method to measure cease of plant root growth.
MNS ISO 11269-2:2013.	Soil quality. Determination of the effects of the plant pollutants in soil. Part 2: Germination of upper plants in polluted soil.
MNS 5850:2008.	Soil quality. Soil pollutants elements and substance
MNS 3297:1991.	Environment protection. Soil. The norm for sanitary condition of soil in town and residential areas.
MNS 3298:1991.	Soil. General requirements for sampling.
MNS 3985:1987.	Soil. Sanitation parameters.
MNS 2305:1994.	Soil. Procedure for sampling, packaging, transportation and storage.
MNS 5546:2005.	General requirements for assessment of soil erosion and degradation of vegetation cover in pasture lands.

MNS number	Name of Mongolian National Standard (MNS)
MNS 4968:2000.	General requirements for production processes.
MNS 4930:2000.	Safety of machinery. General requirements.
MNS 4969:2000.	Organization of a training. Basic rules.
MNS 4643:1998.	Occupational safety. Color of safety signs.
MNS 4994:2000.	Occupational safety and health. Vibration. Requirement for general safety.
MNS 4994:2000.	General requirements for measuring vibration.
MNS 5029:2011.	Occupational safety and health. Label and marking of toxic and hazardous chemicals
MNS 5079:2001.	General safety requirements for loading and unloading.
MNS 5105:2001.	Occupational safety. Industrial hygiene. Hygiene protection areas norm, general requirements.
MNS 5146:2002.	Occupational safety. Industrial hygiene. Electric safety. Protective conductive earth, neutralling.
MNS 5150:2002.	Electric safety. General requirement.
MNS 5145:2002.	Electric safety. Maximum voltage and maximum level of current.
MNS 5149:2002.	Industrial hygiene. Power frequency electric fields. Permissible levels of field strength and requirements for control at workplaces.
MNS 0012.4.005:1985.	Device and method for protection from noise.
MNS 5003:2000.	General requirements for the measurements of noise.
MNS 5002:2000.	Occupational safety and health. Noise. Requirements for general safety.
MNS 12.1.016:1988.	Excessive noise. General safety requirements.
MNS 4990:2015.	Occupational safety and health. Occupational hygiene. Workplace environment. Requirement of hygiene.
MNS 4931:2000.	Personal protective equipment. Types and general requirements.
MNS 5621:2006.	Head protection equipment-Hard hat.
MNS 5388:2004.	Hearing protection equipment (ear plug, ear muff). General technical requirements.
MNS 5389:2004.	Eye protection equipment-Goggles.
MNS 5620:2006.	Respiratory protection equipment. (mask, respirator (filtering device), powered respirators).
MNS 5622:2011.	Safety gloves. General requirements.
MNS 5623:2006.	Foot protection equipment. Safety boots.
MNS 5566:2005.	Protection against fire. Fire protection instrument for building. Technical requirements.
MNS 4244:1994.	Fire safety. General requirements.
MNS 5390:2004.	Occupational safety and health. Fire safety of electricity. General requirements.
MNS 5344:2011.	General requirements for transportation of domestic waste.
MNS 5282:2003.	Fire safety of petroleum products. General requirements.
MNS 3629:1983.	Petroleum, petroleum product. Packaging, labelling and transportation.
MNS 4628:2013.	Fuel station. General technical requirements.
MNS 4596:2014.	Use of road signage, traffic light, protective bracket, and direction signs.
MNS 5342:2007.	Parking lot. Classification and general requirements.
MNS 4597:2014.	Road signs. General technical requirements.
MNS 6515:2015.	Passages for wild ungulates along the highways and railways in steppe and gobi areas. General requirements.
MNS 5645:2006.	Transportation of construction materials in pieces and bulk. Classification, transportation condition. General requirements.
MNS 12.3.004:1983.	Technical service and maintenance of vehicles. General safety requirements.
MNS 4598:2011.	General requirement for technical condition of vehicles.
MNS 4601:2011.	Vehicle maintenance and repair system, definitions.

3.3. Applicable International Conventions

Mongolia has adopted a number of international conventions with regard to environment, biodiversity, hazardous waste management and protection of the cultural heritage, whose requirements need to be taken into account during developing of the Project. A summary of the relevant environmental and cultural heritage conventions is provided in Table 3-3. It is noted that Mongolia is not a signatory to the Aarhus Convention, however that EBRD requires that relevant EU legislation is complied with, including this Convention.

Table 3-3. Applicability of international conventions signed by Mongolia

Convention	Year of Accession	Applicability / Comments
Biodiversity		
Convention on Biological Diversity	1993	This Convention is relevant to the Project, since natural ecosystems fall within the Project AoI.
Convention on International Trade in Endangered Species of Fauna and Flora (CITES)	1996	The aim of CITES is to ensure that international trade in endangered species of wild animals and plants does not threaten their survival. No endangered species of wild animals and plants have been identified during baseline survey. The Convention is, therefore, is considered to be of little or no relevance to the Project.
Convention on the Conservation of Migratory Species of Wild Animals	1999	This Convention is potentially relevant to the Project, since migratory animal routes may cross the AoI of the construction sites and the road.
Convention on the Protection of Wetlands of International Importance (Ramsar)	1998	There are no Ramsar (or candidate Ramsar) sites within the Project AoI. The Convention is, therefore, not applicable to the Project.
Climate Change and Ozone Depleting Substances		
UN Framework Convention on Climate Change (UNFCCC) Kyoto Protocol	1994 1999	The Project will result in an indirect increase in greenhouse gas emissions as a result of traffic increases due to the road expansion.
UN Convention to Combat Desertification	1996	Given that land take and earthworks are proposed during the road construction, there is potential for land degradation, and desertification. This Convention is, therefore, applicable to the Project.
Vienna Convention for the Protection of the Ozone Layer Montreal Protocol on Substances that Deplete the Ozone Layer	1996 1996	This Convention is not considered to be relevant to the Project, since it is unlikely that substances that deplete the ozone layer will be emitted during the construction and operation of the road.
Waste and Hazardous Substances		
Convention on the Transboundary Movement of Hazardous Waste (Basel)	1997	This Convention is considered to be of little or no relevance to the Project, since it is unexpected that considerable amount of hazardous waste will be accumulated during the construction and operation of the road.
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	2000	This Convention is not considered to be relevant to the Project.
Stockholm Convention on Persistent Organic Pollutants	2004	This Convention is not considered to be relevant to the Project.
Cultural Heritage		
Convention concerning the Protection of the World Cultural and Natural Heritage	1990	This Convention is relevant to the Project, since unidentified buried objects or features of cultural significance might potentially be found during the construction works.[5]

[5] Given that no detailed survey of the road has been undertaken as part of the Phase I or Phase II road works, the DEIA identifies the requirement for a detailed archaeological and paleontological survey by a professional organization prior to the start of construction. See Section 6.

3.4. Applicable International Labour Organisation Conventions

Mongolia has been a member of the International Labour Organisation (ILO) since 1968 and has ratified a range of ILO Conventions. The list of ratified Conventions is provided in Table 3-4.

Table 3-4. Conventions ratified by Mongolia

Convention Name	Ratification date by Mongolia
Freedom of association, collective bargaining, and industrial relations	
C087 – Freedom of Association and Protection of the Right to Organize Convention, 1948 (No.87)	03 June 1969
C098 – Right to Organize and Collective Bargaining Convention, 1949 (No.98)	03 June 1969
C135 – Workers' Representatives Convention, 1971 (No.135)	08 Oct 1996
Forced Labour	
C029 – Forced Labour Convention, 1930 (No.29)	15 Mar 2005
C105 – Abolition of Forced Labour Convention	15 Mar 2005
Elimination of child labor and protection of children and young persons	
C123 – Minimum Age (Underground Work) Convention, 1965 (No.123) Minimum age specified: 18 years,	03 Dec 1981
C138 – Minimum Age Convention, 1973 (No.138)	16 Dec 2002
C182 – Worst Forms of Child Labour Convention, 1999 (No.182)	26 Feb 2001
Equal opportunity and treatment	
C100 – Equal Remuneration Convention, 1951 (No.100)	03 Jun 1969
C111 – Discrimination (Employment and Occupation) Convention, 1958 (No.111)	03 Jun 1969
Employment policy and promotion	
C088 – Employment Service Convention, 1948 (No.88)	17 Apr 2015
C122 – Employment Policy Convention, 1964 (No.122)	24 Nov 1976
C159 – Vocational Rehabilitation and Employment (Disabled Persons) Convention, 1983 (No.159)	03 Feb 1998
C181 – Private Employment Agencies Convention, 1997 (No.181)	17 Apr 2015
Occupational safety and health	
C155 – Occupational Health and Safety Convention, 1981 (No.155)	03 Feb 1998
C176 - Safety and Health in Mines Convention, 1995 (No.176)	26 Nov 2015
Maternity protection	
C103 – Maternity Protection Convention, 1952 (No.103)	03 Jun 1969
Tripartite consultation	
C144 – Tripartite Consultation (International Labour Standards) Convention, 1976 (No.144)	10 Aug 1998

Source: ILO

3.5. EBRD Performance Requirements

Applicable EBRD PRs are provided in Table 3-5. PR 7 is not applicable as there are no indigenous people along the Project road. PR9 is not applicable as there are no financial intermediaries involved in this Project.

Table 3-5. Applicable EBRD Standards

EBRD Performance Requirements (PRs)	Applicability / Comments
PR1: Assessment and Management of Environmental and Social Impacts and Issues	This PR applies to all projects directly financed by the EBRD and defines the importance of a systematic approach to the management of the environmental and social impacts associated with project activities and operations.
PR2: Labour and Working Conditions	The construction phase will be in the order of 24 months. It is expected that during this period, short term direct employment opportunities will be created. It is expected that the number of construction workforce will be around 2,000 workers. It is likely that national workers/subcontractors may be used.
PR3: Resource Efficiency and Pollution Prevention and Control	The implementation of the Project will be associated with use of natural resource, i.e. soil and water for construction works, and potential air and noise pollution during the road construction and operation. The Project, must, therefore, meet good international practice (GIP) with regard to resource efficiency and pollution prevention and control, and identify project-related opportunities for energy, water and recourse efficiency improvements.
PR4: Health and Safety	A construction workforce will be required. The road route passes though several urban settlements and lies in an area that is used for grazing by herders. The requirements of this PR are, therefore, applicable for the Project in relation to identification and prevention of accidents, injury and diseases to workers and affected communities, training relating to health and safety hazards, risks, and protective and preventive measures.
PR5: Land Acquisition, Involuntary Resettlement and Economic Displacement	This PR is considered to be relevant to the Project, since economic displacement is likely to occur as a result of the Project. The location of assets within the footprint of the proposed works have been identified by the MRTD for both the Phase I and Phase II projects.
PR6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Temporary and permanent landtake, construction-associated noise, vibration and dust, construction activities near water bodies will result in disturbance and nuisance to terrestrial and aquatic flora and fauna.
PR8: Cultural Heritage	Liaison with the DEIA consultant indicates that there are six Ovoos that will need to be relocated within the EBRD project. The field visit along the road by the ESA team also identified two potential burial tomb/mound of unknown age. This PR is, therefore, applicable to the Project.
PR10: Information Disclosure and Stakeholder Engagement	The Project will require stakeholder engagement to promote and provide means for adequate engagement with affected communities, and to ensure that grievances from affected communities and other stakeholders are responded to and managed appropriately. Requirements covers engagement during project preparation and implementation, and external reporting.

4. Summary of Environmental and Social Impacts and Risks

4.1. Construction Phase

A summary of environmental and social impacts and risks during the construction phase as identified in the DEIA and supplementary ESIA is provided in Table 4-1.

Table 4-1. Summary of environmental and social impacts during the construction phase

Construction Activity / Sources of Impact	Potentially Sensitive Receptors	Potential Impacts
Air Quality		
Preparation and use of temporary haul roads Loading, transporting and unloading dust generating earth materials Blasting Concrete batching plant Onsite crushers for asphalt plant Construction and passenger vehicle movements Topsoil storage piles Rehabilitation of temporarily disturbed areas Gaseous and GHG emissions from road construction machinery Fumes containing small quantities of volatile organic compounds and poly-aromatic hydrocarbons from asphalt paving	Communities and businesses living and working in the main towns that the road crosses through, i.e. the 61st railway station, Bayanchandmani soum, Baruunkharaa soum, Khongor soum and Darkhan city Nomadic herders who camp near the road construction sites on a permanent or seasonal basis Flora and fauna, including livestock Agricultural crops Road construction workers and camp residents	Dust pollution (Particulate Matter, PM) Air pollution with gaseous emissions (CO, NOx and SO_2) and potential exceedance of standards Potential GHG emissions
Noise and Vibration		
Operation of vehicle engine and transmission mechanisms Excavation and reconstructing embankment, quarry/borrow pit activities Concreted mixers	Communities and businesses living and working in the main towns that the road crosses through, including the 61st railway station, Bayanchandmani soum, Baruunkharaa soum, Khongor soum and Darkhan city Nomadic herders who camp near the road construction sites on a permanent or seasonal basis Fauna, including livestock Road construction workers and camp residents	Noise and vibration disturbance and exceedance of standards
Soils		
Removal of soils during earthworks Clearance of vegetation Construction vehicle movements Temporary storage and access roads, if required Stockpiling Use of machinery and construction vehicles Construction wastes and wastewater Potentially contaminated land	Topsoil Local communities Construction workers Livestock Flora and fauna Agricultural crops Groundwater and surface water bodies	Loss and deterioration of soils Compaction of soils Potential contamination of soils and risk of encountering potentially contaminated soils

Construction Activity / Sources of Impact	Potentially Sensitive Receptors	Potential Impacts
Borrow sites and quarries		
Surface Water and Groundwater		
Surface Water Construction of bridge and culverts Digging of ditches and drainage Presence of construction camps Operation of equipment, such as asphalt plant Cleaning of road construction machinery / vehicles near surface water or in channels Accidental spills of fuels or chemicals from construction equipment and vehicles **Groundwater** Water demand for construction activities and workers Accidental release of fuel or chemicals from construction equipment and vehicles Accidental fuel contamination from spills or leaks during removal of elements (e.g. access roads) of petrol stations Cleaning of road construction machinery / vehicles near groundwater sources Accidental damage to above ground well infrastructure	Hydrology regime Communities that use surface water/groundwater Nomadic herders and their livestock, who use surface water/groundwater for drinking Road construction workers and camp residents	Surface water and groundwater resources depletion Changes of the natural drainage regime by altering natural sheet run-off and stream hydrology Changes of water channel continuity and the hydromorphology of the rivers Pollution of surface water and groundwater resources Flood risk
Material Use and Waste Management		
Earthworks including excavating, site clearance and land levelling Construction works, including construction equipment repair and maintenance Worker's accommodation camps Borrow pits and quarries	Construction workers Project and third-party waste facilities Local communities Flora and fauna (including livestock) Surface water bodies and ground water Soils	Depletion of material resources, including sand, water Accumulation of large volumes of excavated materials, construction wastes, municipal solid waste Potential environmental pollution with hazardous waste such as used oil, empty drums or replaced parts of the construction machinery
Flora		
Temporary and permanent landtake Road construction and increased traffic around road construction area Activities associated with quarries and borrow pits Construction activities near waterbodies	Terrestrial habitats and plants Aquatic flora	Habitat loss and degradation
Fauna		
Temporary and permanent landtake Movements of construction vehicles and equipment Increased human activities for example, construction workers and temporary construction camps Presence of the construction sites Use of equipment resulting in air and noise emissions Construction activities near waterbodies	Breeding and nesting birds Mammals Aquatic habitats and fish	Habitat loss and degradation Severance of wildlife corridors Road collisions e.g. livestock and wildlife Loss of life (hunting)

Construction Activity / Sources of Impact	Potentially Sensitive Receptors	Potential Impacts
Cultural Heritage		
All earthworks, including geotechnical investigations, land clearance, surface levelling and construction works Construction camps and other temporary facilities Movement of equipment and construction vehicles Construction workforce	Identified tangible cultural heritage (archaeological objects and sacred sites) Non-identified tangible cultural heritage (archaeological objects and sacred sites) Local communities in the AOI	Partial or total removal of a cultural heritage receptor Damage to a cultural heritage receptor from construction related vibration Burial of a receptor under spoil created by construction Disturbance to traditional lifestyles of nomadic herders
Socio-economics and Labour Conditions		
Construction works and demand for workers and products Footprint requirements of the project Works restricting access Construction sites resulting in temporary restrictions on access Demand for works and products Economic and physical displacement (see land tenure, land use and displacement above) Access to construction sites, increase in construction vehicle movements Influx of construction workers Movement of construction-related vehicles and equipment Use of power, water and local services e.g. health services Poor ethical conduct	National, regional and local government and administrations Communities and businesses living and working in the main towns that the road crosses through - these include the 61st railway station, Bayanchandmani soum, Baruunkharaa soum, Khongor soum and Darkhan city Roadside businesses and stall holders/road side sellers Nomadic herders who camp near the road construction sites on a permanent or seasonal basis and move around with their herds Livestock owners Women Tourists Vulnerable people including women Construction workers and camp residents	Positive impact on the national economy Employment opportunities for local people, both positive and negative if it causes local tensions Loss of pasture land close to the existing road and temporary loss of access to pasture by herders Loss of access, i.e. a mixture of statues, billboards, cultural heritage features (ovoos), roadside market stalls, petrol stations and restaurants Increase of the transferable skill base and future income generating prospects of Project workers Improved financial security, extended skills and experience, and enhanced self-esteem Access restrictions across the roads which will cause some general nuisance to local road users Elevated risks to public health as a result of increased construction traffic and equipment use, including, respiratory damage. Increases in noise levels Risk of injury from construction traffic Local discomfort and nuisance Potential conflicts with local people The risk of contracting HIV/AIDs or other Sexually Transmitted Diseases (STDs) Risks to workforce health and safety Demand for electricity, water and health facilities affecting use by local communities Differential impacts on vulnerable people and groups Conflict with local communities, in particular women and young girls

4.3. Operation Phase

A summary of environmental and social impacts during the operation phase as identified in the DEIA and supplementary ESIA is provided in Table 4-2.

Table 4-2. Summary of environmental and social impacts during the operation phase

Operation Activity / Sources of impact	Potentially Sensitive Receptor	Potential Impacts
Air Quality		
Combustion emissions from increased volume of road vehicles closer to properties due to road widening	Receptors that may be affected within 200m of the road: • Properties in the main towns that the road crosses through (61st railway station, Bayanchandmani soum, Baruunkharaa soum, Khongor soum and Darkhan city) • restaurants along the road • nomadic herders who camp near the road	Dust pollution and gaseous emissions of CO, NOx, SO_2, PM and VOCs from increased traffic volumes
Noise		
Increased volume of road vehicles closer to properties due to road widening	Receptors that may be affected within 100m of the road: • Properties in the main towns that the road crosses through (61st railway station, Bayanchandmani soum, Baruunkharaa soum, Khongor soum and Darkhan city) • restaurants along the road • nomadic herders who camp near the road	Increases in noise in exceedance of Mongolian standards
Surface Water and Groundwater		
Drainage from road O&M activities, including accidental release of fuel or chemicals	Hydrology regime, including rivers and groundwater Communities that use surface and ground water	Changes of natural drainage regime by altering natural sheet run-off and stream hydrology Potential water body pollution due to accidental leaks or spills during the maintenance of the drainage system Risk of flooding during periods of heavy rainfall and snow melting
Waste		
Road operation, repair and maintenance activities Waste generation at 13 stops proposed along the road	Workers Project and third-party waste facilities Local communities Flora and fauna (including livestock) Surface water bodies and ground water Soils	Accumulation of wastes generated as a result of maintenance/repair works, i.e. concrete, asphalt concrete materials, oil and lubricants, waste electrical and electronic equipment (WEEE) Accumulation of waste generated by maintenance staff, i.e. organic waste, paper, plastic, glass, metal, other hazardous and non-hazardous waste Possible cross contamination, wind-blown litter, and contamination of air, soil and water resources Indirect impact on human health due to cross contamination
Flora and Fauna		
The increase in road traffic	Livestock Red deer	Potential increased risk of collisions and RTAs involving animals (livestock / wildlife), resulting in

Operation Activity / Sources of impact	Potentially Sensitive Receptor	Potential Impacts
	Marmot	fatalities or injuries
Socio-economics		
Road design (signage, barriers, traffic calming measures) Operations and maintenance activities Increased road traffic Use of local health facilities (road traffic accidents)	National and regional government International trade Road users Communities and businesses living and working in the main towns that the road crosses through. These include the 61st railway station, Bayanchandmani soum, Baruunkharaa soum, Khongor soum and Darkhan city; and roadside businesses / stall holders / sellers Nomadic herders who camp near the road on a permanent or seasonal basis Livestock owners Tourists Vulnerable people / groups e.g. children, women	National, regional and local economic and employment Greater traffic movements, including of trade along the economic corridor between Mongolia, Russia and China Potential increase in investment and domestic tourism in the wider Project Area Development of road services, increase potential economic benefits for existing services along the road (e.g. restaurants and petrol stations) Potentially improve livelihoods of local small businesses like vegetable growers and herders who sell their produce in road side stalls Employment opportunities for local road maintenance companies Economic displacement of nomadic herders due to restriction of access by herders and their livestock Improved transport links between soums and improved health and safety from improved design at ten major accident blackspots Improved safety conditions

5. Organisational Structure

The broad role of each organisation involved in the Project is set out below; the detailed organisational structure for Phase II delivery shall be developed once the Supplementary Reports have been disclosed and once Construction contractors are appointed.

5.1. Lender

The EBRD will potentially finance this Project. Responsibility for Project delivery will be with the Project Owner; however, reports will be required to be submitted to EBRD on the status of the ESAP, resolution of grievances and ESHS Project performance.

5.2. Project Owner

The MRTD is responsible for transport sector policy and for planning, developing and regulating transport in the road, railway, and aviation sectors in Mongolia, and is the Project Proponent in the context of this Project. They have overall responsibility for the construction and operation of the Project.

5.3. Construction Phase Management

Construction contractors will be appointed for the construction of the works. The Phase II works have been divided into five Lots and therefore up to five separate contractors could be commissioned; though this may be reduced if the same Construction contractor wins more than one section.

In addition, separate commissions are in place for construction of the Phase I ADB funded works. It has been proposed that the Phase II contracts are to contain a provision that some sites cannot be started until the Phase I works are completed for example, where the Phase II road is online in restricted working areas e.g. urban areas. It is therefore possible that, at some sites, Phase I and II contractors could be out on site at the same time whereas for other sites, works may be sequential.

5.4. ESHS Management

Within the PIU, a person responsible for ESHS of the Phase II Project will be appointed. This individual will be responsible for developing this current ESMMP into the Project ESHS, ensuring adequate training of the PIU staff and, where necessary, contractor staff.

Contractors shall provide sufficient staffing to manage the ESHS performance of the Project, with ESHS staff to be approved by the PIU. Contractors will also be responsible for developing detailed Lot-specific Construction ESMMP for their Lot(s), for approval by the PIU.

Construction contractors will be expected to undertake monitoring and inspections of their compliance with the Project ESHS documentation, including the Lot-specific Construction ESMMPs, and the PIU will undertake regular inspections and audits of contractors to ensure compliance with the Project environmental and social mitigation measures.

Due to the large number of potential interfaces, it will be essential to ensure that the contractual relationships between the MRTD, PIU, ADB, EBRD and various contractors is clear.

5.5. Summary of Responsible Bodies

A summary of the relevant responsible bodies are summarised in Table 5-1.

Table 5-1. Project proponent and responsible organisations

Organisation	Project function	Report to
MRTD	Loan beneficiary, responsible for developing and implementing the Project Phases I and II. Responsible for all land acquisition. Also responsible for operation and maintenance activities.	Government EBRD
Road police	Responsible for road safety and will be required to approve the road safety measures that have been proposed.	Government
Local Provincial (aimag) governments	Support MRTD in all permanent and temporary acquisition of land for the Project. Liaise with local communities.	MRTD

Organisation	Project function	Report to
Regional Departments of various Ministries	Project approval, issue of permits for various construction works.	Ministries
MCPC	Mongolian road design engineering contractors.	MRTD
ADB	Funding Phase I works.	ADB Board
EBRD	Potentially funding Phase II works.	EBRD Board
PIU	General control of the Phase II project construction. Selection and control of contractor s in accordance with contract conditions and schedule.	EBRD, ADB, MRTD
Consultants	Surveys and studies.	MRTD, ADB, EBRD
Construction contractors	Responsible for constructing the road to tender specifications for each relevant lot they are commissioned for.	MRTD, PIU
Operation and maintenance (O&M) contractors	Contractor for various O&M activities.	MRTD

6. Environmental and Social Management

6.1. Introduction

The ESMMP forms part of the wider Project ESHS. The Project ESHS will provide a set of policies, procedures, tools and management plans to identify and manage environmental and social risks. An overview of the ESHS and management plans required for this Project is set out below, together with the mitigation and management measures required to be implemented as reported in the DEIA and the Supplementary ESIA. The Monitoring Plan is set out in Section 7.

6.2. Environmental, Social, Health and Safety Management System (ESHS)

An overarching Project ESHS will be prepared by the MRTD/PIU. The ESHS will provide the framework for the Construction contractors' management systems, thus enabling a common standard to be met by all contractors. The ESHS will also provide the framework for the development of O&M management plans.

The Project ESHS will cover the following:

- Policies and procedures;
- Project ESMMP;
- Permit Register;
- Project SEP;
- Project Land Acquisition and Resettlement Plan (LARP);
- Roles and roles and responsibilities; and
- Project schedule/programme.

The policies to be covered include:

- Environmental and social policy;
- Human resources policy (covering labour and working conditions and community health and safety);
- Contractor/Supplier policy; and
- Project Code of Conduct.

The management plans required as a minimum are set out below; and the monitoring plan in Section 7.

Relevant requirements during construction will be made the responsibility of Construction contractors, monitored by the PIU; and during operation the responsibility of the MRTD.

During construction, integration of the Project ESHS and Project ESMMP across Construction contractors and with the ADB Phase I project will be required at common interfaces.

6.3. Environmental and Social Management Plans

6.3.1. Overview of Required Measures and Management Plans

This document provides the MRTD/PIU and contractors with a framework for the development of a detailed Project ESHS and Lot-specific management plans.

During pre-construction, a number of additional surveys and measures have been identified that need to be addressed and incorporated into the Project ESMMP to be developed by the MRTD/PIU. This may also include updating mitigation measures defined in this ESMMP due to technical design changes or due to new survey data.

During construction, Construction contractors will be required to comply with all relevant Mongolian legislation and related standards as well as the measures set forth in the Project ESHS. Prior to the start of construction, Construction contractors will be required to prepare detailed Lot-specific Construction ESMMPs in line with the Project ESHS/ESMMP, to be approved by PIU.

Post-construction/pre-handover, Construction contractors will also be responsible for delivering any post-construction measures to the approval of the PIU.

During operation, the MRTD and any of their O&M contractors will be required to comply with all relevant Mongolian legislation and related standards as well as the Project ESHS. Prior to the start of operation, the MRTD should prepare the detailed O&M Plan.

The environmental and social management plans that need to be developed for the Project will contain:

- Roles and responsibilities;
- General measures to be employed;
- Site specific measures to be employed
- Inspection and monitoring requirements, including tools;
- Inspections, audits and reporting; and
- Non-conformance and Accident/Incident procedures.

6.3.1.1. Pre-construction phase

Detailed management plans and measures to be addressed during the pre-construction phase to be prepared by the MRTD/PIU include:

- Updated Project ESHS and Project ESMMP;
- Permit register;
- Project SEP;
- Archaeological and paleontological report; and
- Project Land Acquisition and Resettlement Plan (LARP).

Detailed management plans during the pre-construction phase to be prepared by the Construction contractor include:

- Pre-construction noise monitoring report (see Section 7);
- Pre-construction air quality report (see Section 7);
- Pre-construction surface water quality report (see Section 7);
- Pre-construction plant cover report (see Section 7);
- Lot-specific Construction ESMMP including a Site Construction Management Plan and Workers' Camp Management Plan;
- Lot-specific Construction SEP; and
- If required, Lot-specific LARP.

6.3.1.2. Construction phase

The Construction contractor will implement their detailed Construction ESMMP during the construction phase; it will include:

- Workers' Camp Management Plan
- Water Management Plan
- Materials use and Waste Management Plan (including quarries/borrow pits)
- Biodiversity Management Plan
- Emergency Preparedness and Response Plan
- Spill Prevention and Response Plan
- Traffic Management Plan
- Community Health and Safety Management Plan
- Labour Management Plan

- Occupational Health and Safety (OHS) Plan
- Cultural Heritage Management Plan and Chance Finds Procedure
- Soil Management Plan
- Noise and Vibration Management Plan
- Air Quality Management Plan
- Training Plan
- Security
- Grievance Mechanisms

6.3.1.3. Post-construction/pre-handover phase

A Reinstatement Plan will be prepared for the post-construction phase, prior to site handover, for adequate and effective rehabilitation of borrow pits and all land disturbed during construction.

6.3.1.4. Operation and maintenance phase

The operational ESMMP (the O&M Plan) will contain the measures for implementing activities provided in this document for the operational phase.

6.3.2. Stakeholder Engagement Plan

A Supplementary SEP has been prepared as part of the ESA. The SEP is a living document, so will be updated throughout the construction and operational phases of the Project. During construction, the MRTD/PIU will manage the overall implementation of the stakeholder engagement process, including development of a Project SEP to provide an overarching approach to engagement consistent across all contractors.

The Project SEP will be developed by the individual Construction contractors (Lot-specific Construction SEP) for implementation prior to and during construction for their specific Lots.

During operation, the Project SEP will be the responsibility of the MRTD.

6.3.3. Land Acquisition and Resettlement Framework

A Land Acquisition and Resettlement Framework (LARF) has been prepared as part of the ESA. The MRTD is responsible for the preparation of a land acquisition and resettlement plan (LARP) in accordance with the LARF to demonstrate that the land is available for the road.

Construction contractors will be responsible for ensuring that they have identified and secured all temporary land requirements (e.g. construction camps, borrow pits, haul roads, etc) and that where these will result in temporary or permanent physical and/or economic displacement, the sites are secured in accordance with the LARF. Where required, Construction contractors will need to prepare a LARP; in liaison with and for approval by the PIU.

6.4. Environmental and Social Management Measures

The aim of the ESMMP is to specify and combine all topic-related commitments, actions and legal, including permit and licence, requirements. This ESMMP is set out for each stage of the Project, i.e. pre-construction, construction, post-construction/pre-handover, and operation in Tables 6-1 to 6-4, respectively and cover the following:

- Mitigation measures;
- Source of commitment, i.e. DEIA or Supplementary ESIA;
- Regulation if available, i.e. MNS or Mongolian laws;
- Responsible party;
- Management Plan, if applicable;
- Verification method/Compliance monitoring; and
- Reporting format.

Table 6-1. Pre-construction phase environmental and social mitigation management measures

Mitigation Measure	Source	Regulation (if available)	Responsible party	Management Plan, if applicable	Verification Method / Monitoring of compliance	Reporting format
Detailed ESHS and ESMMP						
Preparation of detailed Project ESHS including policies and ESMMP, following implementation of PIU and completion of pre-construction surveys. The Project ESMMP should cover: • Roles and responsibilities • General measures to be employed • Site specific measures to be employed • Inspection and monitoring requirements, including tools • Inspections, audits and reporting • Non-conformance and Accident/Incident procedures The ESMMP should include results of additional surveys to be undertaken prior to start of construction on site.	Supplementary ESIA, ESAP, ESMMP		MRTD/PIU	ESHS, ESMMP	Availability of Project ESHS, policies, ESMMP	Inspection records
Develop Project policies and Code of Conduct within ESHS, covering as minimum: • Environmental and Social policy • Human resources policy (covering labour and working conditions and community health and safety) • Contractor/Supplier policy • Code of Conduct	Supplementary ESIA, ESAP, ESMMP		MRTD/PIU	ESHS, ESMMP	Availability of Project ESHS, policies, ESMMP	Inspection records
Adoption of Project ESHS and preparation of detailed lot-specific ESMMP. This should cover: • Workers' Camp Management Plan • Water Management Plan • Material Use and Waste Management Plan (including quarries/borrow pits) • Biodiversity Management Plan • Emergency Preparedness and Response Plan • Spill Prevention and Response Plan • Traffic Management Plan • Community Health and Safety Management Plan • Labour Management Plan • Supply chain management • Occupational Health and Safety Plan • Cultural Heritage Management Plan Chance Finds Procedure • Soil Management Plan • Noise Management Plan • Air Quality Management Plan • Grievance mechanisms	Supplementary ESIA, ESAP, ESMMP		Construction contractor	ESHS, ESMMP	Adoption of Project ESHS and availability of lot-specific Construction ESMMP.	Inspection records

Mitigation Measure	Source	Regulation (if available)	Responsible party	Management Plan, if applicable	Verification Method / Monitoring of compliance	Reporting format
• Training Plan • Security Development of detailed Lot-Specific Construction ESMMPs.						
Permits						
Permit register to be developed and provided to contractors. Permit register to include as a minimum: • Water permit - well drilling permissions from the local soum authorities and water use permission from the basin administration. • Access. Haul road permissions from relevant authority. • Waste. Permission for waste disposal from relevant authority • Waste. Ensure that contractors transporting waste have relevant approvals by the authorities.	Supplementary ESIA, ESAP		MRTD/PIU	ESHS	Permit Register	Permit Register
All necessary permits to be in place prior to the start of permitted activities (e.g. water abstraction permit batching plant, construction camps, borrow pits, etc.).	Supplementary ESIA, ESAP		Construction contractor	ESHS	Permit obtained	Permit documentation
Stakeholder engagement						
Development of Supplementary SEP to provide an overarching (Project SEP) approach to construction stakeholder engagement that manages interfaces related to delivery of stakeholder engagement between Phase I/II projects and contractors in different Lots.	Supplementary SEP, ESAP		MRTD/PIU	Project SEP	Availability of Project SEP, Grievance Mechanism and Grievance Register	Project Construction SEP Grievance mechanism
Ensure early notice to villages and residents prior to major project activities that could affect them.	Supplementary SEP, ESAP		MRTD/PIU	Project SEP	Notices displayed	Engagement register Minutes of meetings
Develop detailed construction SEPs for relevant Lot, for approval by PIU.	Supplementary SEP, ESAP		Construction contractor	Lot-specific Construction SEP	Appointment of Community liaison officer or equivalent Availability of Lot-specific Construction SEP, Grievance Mechanism and Grievance Register	Engagement register Minutes of meetings
Undertake public education/awareness raising sessions in high risk areas (i.e. construction near population centres, schools, etc.) and with high risk groups (e.g. herders, for example, encourage herders not to leave small livestock unattended).	Supplementary SEP, ESAP		Construction contractor	Lot-specific Construction SEP	Meetings held and recorded Number of grievances recorded	Lot-specific Construction SEP Grievance mechanism
Cultural Heritage						
Hire professional organization to conduct archaeological and paleontological survey and, as necessary, incorporate mitigation measures into ESMMP.	DEIA	Law on Protection of Cultural	MRTD/PIU		Professional certificate verification Archaeological and	Archaeological and paleontological survey report

Mitigation Measure	Source	Regulation (if available)	Responsible party	Management Plan, if applicable	Verification Method / Monitoring of compliance	Reporting format
		Heritage, 2001			palaeontological survey program	
Permanent land acquisition						
Gaps identified in the LARF will need to be addressed by the MRTD in accordance with EBRD PR5 through the preparation of a LARP.	LARF, ESAP		MRTD/PIU	LARF	LARP which covers LARF requirements	LARP / document evidence
Flood Risk						
Capacity of the receiving water body at key discharge points should be assessed.	Supplementary ESIA		Design Consultant		Technical report capacity of the receiving water body	Technical report
Temporary land acquisition						
Contractors to identify all temporary site requirements. Contractors will be required to select temporary site requirements on the basis of minimal environmental and social impacts, and assess final sites chosen so that, where necessary, additional mitigation measures can be applied to reduce adverse impacts.	Supplementary ESIA		Construction contractor	Site Construction Management Plan	Maps with worker camp locations (include camp lay out, welfare facilities, and first aid kit locations), haul roads, construction lay down areas including location of fuel storage areas.	Inspection reports
Contractors who require additional temporary land should undertake this in a manner to avoid economic and physical displacement. Where involuntary displacement is not possible, a LARP must be prepared and implemented in accordance with the LARF.	LARF, ESAP		Construction contractor	LARF	LARP which covers LARF requirements	LARP
Worker camps will be established in accordance with EBRD/IFC guidance: Workers' accommodation: processes and standards[6]. Plan to be prepared for approval by PIU a Camp Management Plan prior to construction.	Supplementary ESIA, ESAP		Construction contractor	ESMMP	Availability of Camp Management Plan that covers EBRD requirements, approved by PIU. Details of a) sewage treatment system for camp sanitation, b) fire fighting equipment c) first aid equipment d) code of conduct for staff, e) accommodation facilities - separate sleeping areas and toilets for male and female workers f) code of conduct for staff.	Inspection reports

[6] EBRD/IFC (August 2009), Workers' accommodation: processes and standards. A guidance note by IFC and EBRD. Available at: https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_gpn_workersaccommodation

Mitigation Measure	Source	Regulation (if available)	Responsible party	Management Plan, if applicable	Verification Method / Monitoring of compliance	Reporting format
Flora and fauna						
Assess the potential for invasive species risks once the road construction contractors are selected through tendering.	Supplementary ESIA		MRTD/PIU	Biodiversity Management Plan	Availability of invasive species risk report once the road construction contractors are selected	Invasive species risk report

Table 6-2. Construction phase environmental and social mitigation management measures

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Air Quality, Dust						
Comply with Mongolian dust emission standard (MNS 4585: 2007).	DEIA	MNS 4585:2007	Construction contractor	Air Quality Management Plan	Monthly analysis	Monitoring records
Regular dust suppression (watering based on 2-4 litres/m^2) along roads and the earthwork sites.	DEIA	MNS 4585:2007	Construction contractor	Air Quality Management Plan	Daily visual inspection	Inspection records
Crusher site and mixing plants shall be located at a distance of at least 500 m to 1 km downwind from sensitive receptors. Crusher site will be cleaned on regular basis to remove fine dust.	DEIA		Construction contractor	Air Quality Management Plan	Daily visual inspection	Inspection records
Enforce speed limits for all construction vehicles of no more than 20 km/h.	DEIA		Construction contractor	Traffic Management Plan	Availability of Traffic Management Plan Continuous control	Inspection records
Earth material transporting trucks shall be covered with tarpaulin.	DEIA		Construction contractor	Air Quality Management Plan	Daily visual inspections/checks	Inspection records
PPE will be provided to workers exposed to dust.	DEIA		Construction contractor	OHS Management Plan	Daily visual inspection	Inspection records
Construction vehicles will strictly follow approved deviation routes to avoid creating multiple earth tracks. Erect visible signs informing site road traffic of permissible routes. Parked construction vehicles and equipment will not be located in proximity to sensitive receptors (e.g. health centres, schools).	DEIA Supplementary ESIA	MNS 4596:2007	Construction contractor	Traffic Management Plan	Availability of Traffic Management Plan Daily visual inspection	Inspection records
Soil stripping during windy periods will be prohibited where this does not constrain the construction programme; or water dousing will be employed.	DEIA		Construction contractor	Soil Management Plan	Availability of the Reinstatement Management Plan Inspections during soil stripping	Inspection records

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
					prior to the start of construction	
Blasting activities will be restricted during windy conditions.	Supplementary ESIA		Construction contractor	Air Quality Management Plan	Daily inspections Continuous control	Inspection records
Inform communities and stakeholders of blasting and construction schedule in advance activities.	Supplementary ESIA	Law on Environmental Protection MNS 4585:2007	MRTD/PIU	Lot-specific Construction SEP	Availability of Lot-specific Construction SEP Number of grievances	Consultation records
All project staff including drivers to be inducted for environmental awareness and site procedures, for example vehicle speed, use of designated roads.	Supplementary ESIA		Construction contractor	Air Quality Management Plan	Availability of environmental awareness and site procedures Check the training records	Training records
Where practicable, implement a wheel washing system to dislodge accumulated dust and mud prior to leaving the sites.	Supplementary ESIA		Construction contractor	Air Quality Management Plan	Check wheel washing system is in place Weekly visual inspections	Inspection records
Rehabilitate disturbed areas as soon as practicable.	Supplementary ESIA		Construction contractor	Soil Management Plan	Visual inspection of the status/conditions of each construction site/disturbed land plot at the end of use of site	Inspection records
Air Quality, Gaseous Emissions						
Regular inspection and maintenance of machinery and equipment. Vehicles and machinery that meets the emission standard only shall be allowed to operate. Inspection of construction vehicles at start of construction and regularly to ensure the vehicles meet relevant emission standards.	DEIA	Law on Air MNS 4585:2007 MNS 5885:2008	Construction contractor	Air Quality Management Plan	Inspection of the construction vehicles before the start of the construction Monthly inspection	Machinery and equipment inspection records Construction vehicle inspection records
Prohibit burning of flammable materials.	DEIA		Construction contractor	Air Quality Management Plan	Visual inspection Continuous control	Inspection records of any evidence of flammable materials burning
Prohibit idling of road construction machinery.	Supplementary ESIA		Construction Contractor	Air Quality Management Plan	Daily inspection Continuous control	Inspection records
Noise and vibration						
Specify, purchase and use the construction machinery and equipment that produce such level of noise and vibration that are within permissible level of relevant standards, or that are equipped with noise reduction devices.	DEIA	Law on Environmental Protection Law on	Construction contractor	Noise and Vibration Management Plan	Review of the technical specifications of the machinery and equipment	Technical report Noise monitoring records

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Ensure noise emission levels of vehicles and machinery comply with national standards.		Occupational Safety MNS 4585:2007			Monthly monitoring Number of grievances	Grievance register
Position construction plant and activities to minimise noise at sensitive locations. Restrict working hours if noise exceeds guidance at NSRs.	DEIA, Supplementary ESIA	Law on Environmental Protection MNS 4585:2007	Construction contractor	Noise and Vibration Management Plan	Monthly inspection Number of grievances	Inspection records Grievance register
Regular inspection of vehicle noise emission and timely maintenance. Ensure through preventive inspections and planned maintenance that construction plant are maintained in good condition with regards to minimising environmental noise and vibration as well as workers exposure to harmful noise and vibration. Noise-generating devices should be maintained in good operating condition with regular maintenance.	DEIA, Supplementary ESIA	Law on Environmental Protection Law on Occupational Safety MNS 4585:2007	Construction contractor	Noise and Vibration Management Plan	Monthly inspection	Inspection records Vehicle maintenance records
Advance warning to local community regarding construction activities (e.g. blasting and construction schedule in advance activities). Ensure community grievance mechanism is in place. Notify nearby residents of blasting works in advance.	DEIA, Supplementary ESIA	Law on Environmental Protection MNS 4585:2007	Construction contractor	Lot-specific Construction SEP	Availability of Lot-specific Construction SEP Number of grievances	Consultation records
Ensure that noise levels do not exceed 55 dBA during the daytime and 45 dBA at night time.	DEIA	Law on Environmental Protection MNS 4585:2007	Construction contractor	Noise and Vibration Management Plan	Daily and night noise monitoring	Noise monitoring records
No noise generating activities from 10 pm to 6 am. However, if night-time works are unavoidable, noisy activities should not be carried out during the core sleep hours, and shoulder periods should preferably be utilised at the beginning and end of the night period.	DEIA, Supplementary ESIA	Law on Environmental Protection MNS 4585:2007	Construction contractor	Noise and Vibration Management Plan	Continuous control Number of grievances	Inspection records Grievance register
Maximum speed limit for all construction vehicles is 20 km/h.	DEIA		Construction contractor	Traffic Management Plan	Continuous control	Daily inspection records
The following measures should be taken to protect employees during construction: a. Do not work more than 8 hours per day in a noisy environment with more than 55 dB level without using	DEIA	Law on Occupational Safety MNS	Construction contractor	OHS Plan	Daily health and safety inspections Daily noise monitoring at workplace	Inspection records

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
ear protective devices. b. Ensure earphones are used regularly. c. Ensure that noise levels not exceeding 55 dBA at any workplaces.		0012.4.005:1985. MNS 5002:2000 MNS 12.1.016:1988				
Avoid unnecessary revving of engines and switch off equipment when not required.	Supplementary ESIA		Construction contractor	Noise and Vibration Management Plan	Daily inspections Continuous control	Inspection records
Start-up plant and vehicles sequentially rather than all together.	Supplementary ESIA		Construction contractor	Noise and Vibration Management Plan	Availability of the construction works schedule/construction management plan Daily inspection Continuous control	Construction works schedule Inspection records
Where necessary and feasible, design and use of site hoardings and screens to provide acoustic screening.	Supplementary ESIA		MRTD/PIU	Noise and Vibration Management Plan	Noise monitoring Visual assessment of the proximity of the nearest residential areas/settlements Number of grievances	Noise monitoring results Grievance register
Ensure the workers camps are located at least 300 m from construction sites and at least 25 m from NSRs such as houses.	Supplementary ESIA		MRTD/PIU Construction contractor	Workers' Camp Management Plan	Availability of the workers camps management plan Visual observations	Workers' Camp Management Plan Visual observation records
Soils – General						
Maintenance of machinery and equipment used in road construction shall be conducted in a designated area where the conditions are not adverse to the soil and the environment.	DEIA		Construction contractor	Soil Management Plan Construction Site Management Plan	Availability of Construction Site Management Plan Weekly inspection	Inspection records
Construction sites should be properly organized. This will reduce the amount of size of degradation area.	DEIA		Construction contractor	Construction Site Management Plan	Availability of Construction Site Management Plan Inspection of the construction site before the start of construction works, and regularly thereafter	Inspection records

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Soil stripping and stockpiling						
Topsoil shall be stripped and stored in accordance with relevant standards and protect against windshield, flood, silt, rocks, construction and other wastes, including: • separately stored in topsoil stockpiles. • stored in a manner that is less susceptible to wind to enable re-use of topsoil for rehabilitation.	DEIA	MNS 5916:2008 MNS 5850:2008	Construction contractor	Soil Management Plan	Availability of Soil Management Plan Weekly visual inspections	Inspection records
Ensure that the following parameters have been met for topsoil stock piles: • maximum height is 2 m, • length is 30-50 m; • lateral slopes shall not exceed 20 degrees, and • the top compacted.	DEIA	MNS 5916:2008	Construction contractor	Soil Management Plan	Availability of Soil Management Plan Weekly visual inspections	Inspection records
Compaction of soils						
Prevent construction vehicles driving on unauthorised/ unplanned areas. Erect signs on deviation and access roads to ensure that heavy duty trucks strictly follow approved deviation tracks to avoid creating multiple earth trucks.	DEIA, Supplementary ESIA	MNS 4596:2007	MRTD/PIU	Traffic Management Plan	Availability of Traffic Management Plan Weekly visual inspections	Inspection records
Soil Contamination						
Develop and implement detailed Spill Prevention and Response Plan for the management of all chemicals, fuels and oils used during the Project, including the septic tanks and diesel generator.	Supplementary ESIA		Construction contractor	Spill Prevention and Response Plan	Availability of Spill Prevention and Response Plan Weekly inspections of the oil storage areas	Inspection records
Spill kits shall be kept in accessible locations at all times during construction, and On-site environmental and safety staff shall be trained with oil spill neutralization skills and their use and disposal.	Supplementary ESIA, DEIA	MNS 5850-2008	Construction contractor	Spill Prevention and Response Plan Training Plan	Availability of Spill Prevention and Response Plan Availability of Training Plan and records of completed training Weekly inspections of the oil and chemicals storage areas	Inspection records Training records
Use of sawdust, sand, cloth or special synthetic absorbent material (TSSW50W) to avoid spreading of soil contamination in the event of an oil spill event.	DEIA	MNS 5850-2008	Construction contractor	Spill Prevention and Response Plan	Availability of Spill Prevention and Response Plan Weekly inspections of the oil storage areas	Inspection records
Procedures for handling, storage, transportation and transfer of waste will be implemented. Designated collection points will be created for, including temporary sites for collection and storage of, domestic and hazardous waste. Construction materials and domestic wastes	DEIA, Supplementary ESIA	Road construction norm БНбД 32-02-00". Clause 109.	Construction contractor	Materials and Waste Management Plan	Availability of Materials and Waste Management Plan and procedures for handling, storage, transportation and transfer of waste	Inspection records Waste transfer notes

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
should be disposed to at approved places. All bulk materials used and wastes generated during the construction activities that have the potential to pollute will be stored within appropriate storage facilities, that are bunded and provided with secondary containment).		MNS 3297:1991 Law on Soil Protection and Prevention from Desertification			Weekly inspections of bulk materials and waste points	
Oil storage and distribution activities shall adhere to the relevant domestic standards such as "Petroleum product supply technology and operating procedures MNS 4633: 2006" and "General technical requirements for Petrol Station and equipment MNS 4633: 2006".	DEIA	MNS 4633: 2006 MNS 4633: 2006	Construction contractor	Spill Prevention and Response Plan	Weekly inspections of oil storage and distribution areas	Inspection records
Maintenance of machinery and equipment used in road construction shall be conducted in a designated area where the conditions are not adverse to the soil and the environment.	DEIA		Construction contractor	Construction Site Management Plan	Availability of Construction Site Management Plan Weekly inspections of machinery and equipment maintenance areas Continuous control	Inspection records
Strict procedures will be followed when refuelling to minimise the risk of spills to the environment.	Supplementary ESIA		Construction contractor	Spill Prevention and Response Plan	Availability of safe working procedure for refuelling activities Weekly inspections of refuelling areas	Inspection records
To mitigate the potential risks to the health of construction workers from existing soil contamination and refuse appropriate PPE will be used, and hygiene facilities made available to all workers.	Supplementary ESIA		Construction contractor	Soil Management Plan	Availability of Soil Management Plan Daily inspections	Inspection records PPE records
Surface water and groundwater						
Implement best practice working methods to be employed for working within and in close proximity to water channels. This includes: • Fuel storage and vehicle wash areas shall be located at a distance of at least 100 m from surface water and drainage channels. • Fuel recharge activities shall be prohibited nearby water protection zones and fuel recharge vehicles shall carry oil absorbing mat.	DEIA, Supplementary ESIA		Construction contractor	Water Management Plan Spill Prevention and Response Plan	Availability of Water Management Plan and Spill Prevention and Response Plan Monthly inspection of implementation of Water Management Plan Weekly inspections of fuel storage and vehicles wash areas Weekly inspection of recharge vehicles	Inspection records
Installation of culverts to avoid channelling and erosion on downstream side of streams/rivers.	Supplementary ESIA		Construction contractor	Water Management	Check that culverts have been installed	Inspection records

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
				Plan		
Avoid site runoff of water or mud from site compounds by providing appropriate temporary drainage.	Supplementary ESIA		Construction contractor	Water Management Plan	Check temporary drainage constructions Weekly visual inspections	Inspection records
Removal of any construction debris from wet or dry ephemeral or permanent streams or drainage channels.	Supplementary ESIA		Construction contractor	Water Management Plan	Monthly inspection of wet and dry ephemeral or permanent streams and drainage channels with regard to the presence of construction debris	Inspection records
Timing of construction activities related to crossings where possible to be undertaken during the dry months, when surface water features are dry or flow is minimal.	Supplementary ESIA		Construction contractor	Water Management Plan	Availability of Water Management Plan Weekly visual observations of construction activities at crossings	Observation/ Inspection records
Rehabilitation of water channel undertaken as soon as practicable following construction of the culvert/bridge.	Supplementary ESIA		Construction contractor	Water Management Plan	Availability of Water Management Plan Visual inspection of water channel crossings after completion of the construction of culverts/bridges	Inspection records
Establish special water protection zone around the crossing points of Kharaa, Saikhan and Bayangol rivers and Bornuur lake with 50 m radius. Within this zone, prevent construction workforce washing vehicles or throwing waste.	DEIA	Law on Water	Construction contractor	Water Management Plan	Availability of Water Management Plan Weekly visual inspection of the special water protection zones to ensure that they are in place and functioning	Inspection records
Establish water protection zone at the crossing points nearby Kharaa, Saikhan and Bayangol rivers and Bornuur lake with 200m radius. Within this zone, it will be prohibited to: establish worker camps, use quarry and borrow sites, use crushing plant and concrete batching plant, implement a waste disposal site or erect toilets.	DEIA	Law on Water	Construction contractor	Water Management Plan	Availability of Water Management Plan Weekly visual inspection of water protection zones to ensure that they are in place and functioning	Inspection records
Develop and implement Spill Management Plan and ensure compliance with safe handling rules for fuels and lubricants. Fuel trucks to carry spill kits. Train all fuel and chemicals handling staff to use spill kits work according to the emergency preparedness and response plan.	DEIA, Supplementary ESIA		Construction contractor	Spill Prevention and Response Plan Emergency Preparedness and Response Plan	Availability of procedures for safe handling of fuels and lubricants Availability of Emergency Preparedness and Response Plan Weekly inspections of machinery/equipment maintenance and repair areas	Inspection records Training records

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
				Training Plan		
Fuels and chemicals to be stored in designated containers with accidental spill control measures including storage on impermeable surface, clear labels, bonding in an area that can contain 110% of the largest container volume. Maintenance points shall have concrete pavement.	DEIA, Supplementary ESIA		Construction Contractor	Materials and Waste Management Plan	Availability of Materials and Waste Management Plan Weekly inspections of fuel and oil products storage areas	Inspection records
Wastewater management as follows: • Vehicle and equipment wash to be undertaken at designated areas where all wastewater can be collected and disposed of by an approved contractor. No direct or indirect discharge to the site or surface water features is permitted. • Wastewater treatment to be implemented in construction camps	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Availability of Materials and Waste Management Plan Wastewater collection license Weekly inspections of the vehicle and equipment wash areas	Inspection records
In the event that previously unidentified contamination is observed during construction, works in the affected area will cease and appropriate mitigation measures designed, or an appropriate disposal process identified.	Supplementary ESIA		Construction contractor	Soil Management Plan	Availability of contaminated land emergency procedure in place Continuous control	Report on identified soil contamination Contaminated land emergency procedure report
All construction wells shall have a well house to protect groundwater quality from pollution.	DEIA		Construction contractor	Water Management Plan	Availability of Water Management Plan Visual inspection of construction wells	Inspection records
Water demand						
Undertake a detailed water needs and supply assessment; and obtain necessary permits from the basin administration. No surface or groundwater to be used without prior permissions in place. Construction workers to be provided with potable water from approved sources.	Supplementary ESIA		Construction contractor	Water Management Plan	Availability of Water Management Plan Availability of water supply licence/ permit	Inspection records
Promote water efficiency through training.	DEIA		Construction contractor	Water Management Plan Training Plan	Availability of Water Management Plan Check whether the workers have received water efficiency training	Water efficiency training program Training records
Monitor water use / extraction from any groundwater wells used.	Supplementary ESIA		Construction contractor	Water Management Plan	Availability of the Water Management Plan Monitor water use / extraction from any groundwater well on monthly basis	Water use/extraction volumes

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Map local herder wells within Project footprint and/or adjacent Project works. Any local herders' wells adjacent to construction works should be demarcated and protected from damage. Any loss of wells by local herders to be replaced.	Supplementary ESIA		Construction contractor	Water Management Plan	Identification of herders' wells Inspection of the herders' wells adjacent to the construction site Inspection of the local herders' wells after the completion of the construction works each construction site	Map with locations of herders' wells Inspection records
Flood risk						
Flood protection trenches (construction drainage) will be installed around all sites liable to be subject to surface water and/or flooding, including the crusher and concrete batching sites and workers' campsites.	DEIA, Supplementary ESIA		Construction contractor	Construction Site Management Plan Water Management Plan	Availability of Construction Site Management Plan and Water Management Plan Inspection of the construction sites liable to be subject to surface water/flooding	Inspection records
Waste Management and Disposal – Non-Hazardous Waste						
Dispose of domestic and construction waste without a permit shall be prohibited.	DEIA		Construction contractor	Materials and Waste Management Plan	Availability of waste permitting documentation	Waste permit
Dispose of waste in environmentally-friendly ways, recycle potential waste and minimize waste at the source.	DEIA		Construction contractor	Materials and Waste Management Plan	Availability of the Materials and Waste Management Plan	Materials and Waste Management Plan
Construction materials and domestic wastes should be disposed to at approved places. Prohibit disposing of domestic and construction waste at non specified places and conduct hygiene disinfection at waste collection points regularly.	DEIA		Construction contractor	Materials and Waste Management Plan	Availability of waste permitting documentation/ licences of the companies responsible for waste disposal Availability of disinfectants	Waste permit Waste transfer note Inspection records: waste collection points, availability of disinfectants Cleaning/disinfection records
Build temporary sites for collection and storage of waste.	DEIA		Construction contractor	Materials and Waste Management Plan	Check the availability of the Materials and Waste Management Plan Weekly visual inspections of the temporary sites for collection and storage of waste	Construction Site Management Plan Materials and Waste Management Plan Inspection records

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Food waste shall be disposed to a designate collection points protected with fencing in order to prevent from animal poisoning.	DEIA		Construction contractor	Materials and Waste Management Plan	Weekly visual inspections of the waste collection and storage areas, including food waste collection points	Inspection results
Materials that generate unpleasant smells should be stored and transported in designated containers.	DEIA		Construction contractor	Materials and Waste Management Plan	Weekly inspections of the domestic waste collection points	Inspection records
Burning of waste prohibited.	DEIA		Construction contractor	Materials and Waste Management Plan Training Plan	Continuous control Weekly inspections of waste collection points - evidence of waste burning (if it took place) Waste training program/ environmental awareness program in place	Inspection records Waste management/ environmental awareness training records
Prepare and implement a detailed Materials and Waste Management Plan. The waste hierarchy shall be applied in project planning to ensure efficient use and management of resources so that priority is to prevent generation of waste at source (i.e.: smart purchase approach by estimating the amount correctly and efficient use of materials so that no surplus material that might end up as a waste) and facilitate waste recovery wherever possible.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Availability of Materials and Waste Management Plan Waste hierarchy included in the Plan	Inspection records Evidence/records of recycling and re use
Pre-determine types and amount of hazardous, non-hazardous and inert waste to be generated as much as possible in order to enable planning of management actions effectively prior to construction (i.e.: define location and volume of waste dumpsites, storage, transportation and disposal of hazardous waste, and waste disposal methods etc)	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Check the availability and the content of the Materials and Waste Management Plan	Inspection records
Provide project employees with training on waste management to improve knowledge and awareness on reducing waste generation, waste types and their classification, and project waste management rules.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan Training Plan	Check that waste training program/environmental awareness program is in place and training records	Waste management/ environmental awareness training records
Provide all vehicles/drivers waste collection sacks to prevent any unauthorized waste disposal.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Weekly visual inspections of vehicles	Inspection records
Equip construction areas with containers for collection of domestic and construction waste and spent fuel and lubricants. Each designated waste storage area will be equipped with waste skips, containers or bins for temporary storage before recycling,	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Weekly visual inspections of storage areas of domestic and construction waste and spent fuel and lubricants.	Inspection records

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
treatment or disposal off site.						
The designated waste storage area will be located away from surface water drains and areas which discharge directly to the water environment.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Availability of Materials and Waste Management Plan Inspection of the waste storage areas	Waste storage areas inspection records
Temporary storage areas for inert and non-hazardous waste will: a. be placed in areas with minimum fire and explosions risks; b. be easily identifiable and clearly signed; c. have periodic inspections and findings documented.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Availability of Materials and Waste Management Plan Weekly inspections of the temporary storage areas for inert and non-hazardous waste	Inspection records
Waste storage containers will be: d. clearly labelled – to describe the contents using the appropriate waste labels which shall be completed e. old labels shall be removed to avoid confusion f. appropriate to the waste they contain g. appropriately sealed (e.g. with a lid or cover) h. not emitting any harmful gases or generating heat	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Availability of Materials and Waste Management Plan Weekly inspections of waste storage containers	Inspection records
Waste Management and Disposal – Hazardous Waste						
For spills, once the sand absorbs oil, it shall be disposed at designated waste disposal area. Before removing contaminated soils, take special containers or plastic bags to avoid pollution.	Supplementary ESIA		Construction contractor	Spill Prevention and Response Plan	Availability of the Spill Prevention and Response Plan, waste permitting documentation in relation to disposal of sand contaminated by oil Waste permitting documentation/ licenses	Inspection records
Hazardous waste transportation will comply with the relevant legislation.	Supplementary ESIA	Regulation on Classification, Collection, Packing, Temporary Placement, Transport, Safety, and Completion of Hazardous Wastes (2012) Law on Waste	Construction contractor	Materials and Waste Management Plan	Availability of Materials and Waste Management Plan Check that the companies responsible for hazardous waste transportation have required licenses	Inspection records

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Waste will be stored in a manner that: • prevents a contact between incompatible wastes, and • allows for inspection between containers to monitor leaks or spills.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Availability of Materials and Waste Management Plan Weekly inspections of hazardous waste storage areas	Inspection records
Hazardous waste will be stored in closed containers away from direct sunlight, wind and rain.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Availability of Materials and Waste Management Plan Weekly inspections of hazardous waste storage areas	Inspection records
Secondary containment systems will be constructed with materials appropriate for the wastes being contained and adequate to prevent loss to the environment. Secondary containment is included wherever liquid wastes are stored in volumes greater than 220 litres. The available volume of secondary containment will be at least 110% of the total storage capacity, or 25% of the total storage capacity.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Availability of Materials and Waste Management Plan Visual inspection of the secondary containment systems	Inspection records
Adequate ventilation will be provided where volatile wastes are stored.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Availability of Materials and Waste Management Plan Weekly inspections of the waste storage areas	Inspection records
Readily available information on chemical compatibility to employees will be provided, including labelling each container to identify its contents.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Weekly inspections of the chemicals and hazardous waste storage areas to check the availability of the information on chemical compatibility and labelling	Inspection records
The hazardous waste storage area will be clearly identified and demarcated, including on a facility map or site plan. Access to hazardous waste storage areas will be limited to employees who have received proper training.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan Training Plan	Availability of Materials and Waste Management Plan and site map Weekly inspections of the hazardous waste storage areas Review of the hazardous waste handling training records	Hazardous waste handling training records Inspection records
Periodic inspections of hazardous waste storage areas will be conducted; inspection findings will be documented.	Supplementary ESIA		Construction contractor		Weekly inspections of the hazardous waste storage areas	Inspection schedule and records
Spill response and emergency plans will be prepared to address accidental releases.	Supplementary ESIA		Construction contractor	Spill Prevention and Response Plan Emergency Preparedness and Response	Availability of the spill response and emergency plans	Accident and emergency records

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
				Plan		
Storage areas will be provided with fire extinguishers, spill kits according to the type and quantity of stored hazardous waste.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Check the Materials and Waste Management Plan Weekly inspection of waste storage areas – check the availability of fire extinguishers and spill kits	Materials and Waste Management Plan Inspection records
Waste containers will be secured and labelled with the contents and associated hazards, be properly loaded on the transport vehicles and be accompanied by a shipping paper with the description of the load and its associated hazards.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Weekly inspection of waste containers Review of hazardous waste loading process as necessary	Inspection records Shipping paper
Hazardous waste will be transported from the construction site to appropriately licenced/permitted facilities for treatment, recycling, re-use or disposal.	Supplementary ESIA		Construction contractor	Materials and Waste Management Plan	Availability of waste licenses/permitting documentation	Inspection records
Flora						
Earthworks shall be executed only within the boundaries of permitted [work] areas. Delineate road camp site access areas and restrict equipment and vehicle movement beyond boundaries.	DEIA, Supplementary ESIA		Construction contractor	Biodiversity Management Plan Traffic Management Plan	Availability of Biodiversity Management Plan and Traffic Management Plan Daily inspection of the construction site and routes Continuous control	Inspection records
Plant monitoring should be conducted twice a year.	DEIA		MRTD/PIU	Biodiversity Management Plan	Review of the monitoring plan and results	Monitoring plan results
Removal / loss of semi-natural habitat will be minimised throughout. Where removal is not possible, it will be necessary for a suitably qualified ecologist / biodiversity specialist to undertake a walkover of these areas in order to inform more detailed mitigation proposals to compensate for losses. If trees are removed, they shall be relocated by professional organizations on the basis of permission from local authorities. Replanting of lost trees on a ratio of at least 1:1.	DEIA, Supplementary ESIA		Construction contractor	Biodiversity Management Plan Reinstatement Plan	Availability of Biodiversity Management Plan and Reinstatement Plan Continuous control Visual inspection of the construction site in relation to presence of trees debris Permission from local authorities for tree removal Check that the company responsible for trees removal has appropriate certificate/licence	Ecology/ Translocation report

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Special attention shall be paid to protection of plant species in water protection zones.	DEIA		Construction contractor	Biodiversity Management Plan Water Management Plan	Availability of Biodiversity Management Plan and Water Management Plan Water protection zones inspections	Inspection records
Harvesting and damaging of plants shall be prohibited and staff shall receive appropriate training.	DEIA		Construction contractor	Biodiversity Management Plan	Continuous control Check program of environmental awareness training with regard to flora protection Check training records	Inspection records Training records
All affected areas will be rehabilitated.	DEIA	MNS 5918:2008 Road construction norm БНбД 32-02-00” Law on Plant Protection. Clause 7.2, 7.5, 7.6-р зүйл. Law on Environmental Protection. Clause 31.	Construction contractor	Reinstatement Plan	Availability of Reinstatement Plan Inspection of the construction site once the construction works are completed	Reinstatement report
Measures should be taken to prevent fire.	DEIA		Construction contractor	Biodiversity Management Plan	Availability of Biodiversity Management Plan	Inspection records
Employ GIP when working in or near watercourses to avoid adverse effects on aquatic flora.	Supplementary ESIA		Construction contractor	Water Management Plan	Availability of Water Management Plan in relation to protection of flora near water courses Weekly inspection of the water protection zones	Inspection records
Fauna						
Hire professional organization to conduct wildlife movement and distribution survey to identify needs of wildlife crossings.	DEIA	Law on Environmental Protection	MRTD/PIU		Check whether the professional organisation/wildlife specialist has	Wildlife movement and distribution

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
		Law on Fauna			been hired Availability of wildlife movement and distribution survey report Measures proposed incorporated into Construction ESMMP	survey report
Construction workforce will be trained on animal protection, in collaboration with police and local environmental departments. Strictly prohibit illegal hunting practices by the construction workforce and provide training awareness to the workforce.	DEIA		Construction contractor	Biodiversity Management Plan Training Plan	Availability and content of Biodiversity Management Plan Environmental awareness training program and training records Continuous control	Environmental awareness training records
Strictly prohibit construction workforce from purchasing illegally hunted meat e.g. marmot from local residents.	DEIA		Construction contractor	Biodiversity Management Plan	Availability and content of Biodiversity Management Plan Continuous control	Inspection records
Collaborate with local governments, environmental departments and specialists on regional biodiversity conservation and assist as needed.	DEIA		MRTD/PIU	Biodiversity Management Plan	Evidence of communication with authorities in relation to biodiversity conservation	Official letters, emails, recommendations
All borrow pits shall be fenced.	DEIA		Construction contractor	Construction Site Management Plan	Weekly visual inspection of the borrow pits	Inspection records
Record and report all wildlife sightings. Provision of awareness training including communication to workforce of high activity/fauna strikes.	DEIA, Supplementary ESIA		Construction contractor	Biodiversity Management Plan Training Plan	Reporting documentation (registers, notes) on wildlife sightings	Register of wildlife sightings Training records
Food waste will be collected in designated containers to prevent wildlife access.	DEIA		Construction contractor	Materials and Waste Management Plan	Weekly visual inspections of the waste collection and storage areas, including food waste collection points	Inspection results
Any vegetation clearance (for Phase I or Phase II works) should be programmed to be completed outside the nesting and breeding bird season. Where this is not possible, it will be necessary for a pre-clearance walkover to be completed by a suitably qualified ecologist to check for the presence of active bird nests. Should any nests be identified, it is recommended that these are excluded from works until such time that the young birds have fledged the nest - detailed advice in this regard should be sought from the ecologist upon completion of survey.	Supplementary ESIA		Construction contractor	Biodiversity Management Plan Site Construction Management Plan	Availability and the content of the Site Construction Management Plan and Biodiversity Management Plan Pre-clearance walkover Check timing of vegetation clearance, and reports/recommendation given by the qualified ecologist	Reports/ recommendations from the qualified ecologist

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
A survey of marmot holes shall be undertaken by a specialist within any project landtake areas. If active marmot holes i.e. holes with resident marmot, are found within the construction area of disturbance, then professional conservation organisations should be involved to capture the animals and relocate to other suitable areas. Note that location of marmot should be kept restricted to avoid hunting of animals.	Supplementary ESIA		Construction contractor	Biodiversity Management Plan	Availability of marmot survey reports. Supporting documentation on the capture and relocation of the marmot organised by the professional conservation organisations	Marmot Survey Report
Avoid creating unnecessary tracks by using only approved routes for materials supply and access roads. Erect clear signs and implement traffic management plan. This should include speed limits for known fauna corridors. Restrict driving /machinery operation activities during periods of peak fauna activity e.g. dawn/dusk.	Supplementary ESIA		Construction contractor	Traffic Management Plan	Availability of Traffic Management Plan Visual inspection of signs indicating speed limits in known fauna corridors	Inspection records
Clean carcasses of dead animals near roads to prevent scavengers coming close to roads.	Supplementary ESIA		Construction contractor	Biodiversity Management Plan	Weekly inspections of the roads	Inspection records
Timely rehabilitation of disturbed areas.	Supplementary ESIA		Construction contractor	Reinstatement Plan	Availability of Reinstatement Plan Inspection of construction sites once the construction works are completed	Reinstatement report
Cultural Heritage						
Hire professional organization to conduct archaeological and paleontological survey prior to construction, including of the two potential burial mounds.	DEIA, Supplementary ESIA		PIU		Availability of archaeological and palaeontological survey report Mitigation measure incorporated into Construction ESMMP	Archaeological and palaeontological survey report
If chance finds occur construction works shall be stopped immediately, and the project administration shall notify the soum, district Governor, the police and the relevant authorities; and hire professionals to identify the finding.	DEIA		Construction contractor	Chance Finds Procedure	Availability of Cultural Heritage Chance Finds Procedure, and chance finds register/reports (if applicable)	Chance finds register
Organize training among construction workers and supervisors to raise awareness on cultural heritage and implementation of the Chance Finds Procedure.	DEIA, Supplementary ESIA		PIU	Training Plan	Availability of cultural heritage awareness training program, and training records Check that Cultural Heritage Chance Finds Procedure is in place	Cultural heritage awareness training records
Workers to be accommodated in worker camps to minimize potential for interference with cultural heritage.	Supplementary ESIA		Construction contractor	Workers' Camp Management	Availability of the Workers Accommodation Management Plan	Inspection reports

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
				Plan	Inspection of the workers movements outside the camps in areas of sensitive cultural heritage	
Clearly fence off any areas that require protection during construction works, with access provided for locals where applicable.	Supplementary ESIA		Construction contractor	Cultural Heritage Management Plan	Availability and content of Cultural Heritage Management Plan, and maps of the construction sites with identified accesses for locals	Inspection reports
Establish Code of Conduct prohibiting worker interaction with cultural heritage.	Supplementary ESIA		Construction contractor	Code of conduct Grievance mechanism	Availability of the Code of Conduct Number of grievances recorded in relation to cultural heritage	Inspection records Grievance register
Minimise publication of details on known cultural heritage resources to prevent theft or damage to sites, unless based on the advice of specialists.	Supplementary ESIA		PIU	Cultural Heritage Management Plan	No damage to known cultural heritage resources	Inspection records
Employment and Economy						
Collaborate with local authorities to reduce discrimination against local workers in the community.	DEIA		Construction contractor	Labour Management Plan Grievance mechanism	Check that the collaboration with local authorities took place Evidence of collaboration/ meetings with local authorities, meeting notes etc	Meeting notes and records Labour Grievance Form and Register
Contractors shall ensure their recruitment process is fully disclosed to the public and open to all people locally of working age and ability, including women. The process should be based on appointment by merit rather than by any political, clan, or class affiliation but should be affirmative with regard to promoting opportunities to less advantaged and more vulnerable people locally.	Supplementary ESIA		Construction contractor	Labour Management Plan Grievance mechanism	Review the job advertising and recruitment process Review the Community Grievance Forms and Registers	Inspection records Community Grievance Form and Register
Contractors shall procure goods locally wherever possible, including perishable goods provided by stall holders who could adversely affected by the Project.	Supplementary ESIA		Construction contractor	Labour Management Plan	Availability of Supply Chain Management procedure	Inspection records
Livelihood, Community Health and Safety						
Contractors shall ensure employment and training of the local workforce.	Supplementary ESIA		Construction contractor	Labour Management Plan Grievance mechanism	Availability and disclosure of Labour Management Plan Review the job advertising and recruitment process Review the Community Grievance Forms and Registers	Labour/recruitment reports Community Grievance Form and Register

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Sufficient access points during construction shall be provided by contractors across works areas to allow people to access both sides of the road. These access points should be identified in liaison with local communities and herders and should include provision for vulnerable people e.g. disabled. Publication of details on temporary crossing locations to the local communities.	Supplementary ESIA		Construction contractor	Construction Site Management Plan Lot-specific Construction SEP Grievance mechanism	Availability of SEP and Construction Site Management Plan Check the presence of access points and whether main movements of herders along the route are mapped out Review the Community Grievance Forms and Registers	Inspection records Community Grievance Form and Register
Transport and accessibility, Community Health, Safety and Security, Vulnerable people and groups						
Wherever possible, the new road should be used as the haul road, with no new haul roads installed.	Supplementary ESIA		Construction contractor	Traffic Management Plan	Weekly inspections of the construction site haul roads used	Inspection records
Construction vehicles to keep to agreed access routes, minimise risk and disruption to project affected communities and other road users and adhere to speed limits. Appropriate ingress/egress required where construction traffic requires to move to/from the haul road to the public road.	DEIA, Supplementary ESIA		Construction contractor	Traffic Management Plan	Check availability and nature of ingress/egress	Inspection records Incidents and Accidents Form and Register
Place warning signs at each intersection/ exit/ entrance junctions Provide temporary signs along any deviation roads.	DEIA, Supplementary ESIA		Construction contractor	Traffic Management Plan	Check during weekly inspections of any deviation roads for the presence of the temporary signs	Inspection records
Coordination and liaison with Phase I contractors where working in the same area.	Supplementary ESIA		Construction contractor	-	Check the availability of the Site Construction Management Plan Check whether the works at the same areas have been coordinated with Phase I contractors	Minutes of meetings
Conduct training for construction workforce on traffic safety procedures.	DEIA		Construction contractor	Traffic Management Plan	Availability of traffic safety procedures Availability of the training register/records	Training register / training records
Appropriate management of interaction of construction traffic with public road users, such as use of traffic marshals/flagmen. Complex traffic control to be coordinated in liaison with the Road Police.	Supplementary ESIA		MRTD/PIU	Traffic Management Plan	Availability and the content Traffic Management Plan	Inspection records Incidents and Accidents Form and Register

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Speed limits shall be imposed on construction traffic to minimise risk of accidents, especially where construction traffic is using the public road and at entrance/egress points onto the public road.	Supplementary ESIA		Construction contractor	Traffic Management Plan	Weekly inspection of the availability of the signs indicating speed limits on construction traffic whether it using the public road and at entrance/egress points onto the public road	Inspection records Incidents and Accidents Form and Register
Implement "5 second stop rule" at limited visibility areas.	DEIA		Construction contractor	Traffic Management Plan	Check the implementation of '5 second stop rule' at limited visibility areas	Inspection records Incidents and Accidents Form and Register
Provide detailed information on construction progress and environmental protection activities to local communities.	DEIA		Construction contractor	Construction SEP Grievance mechanism	Availability of the Construction SEP Availability of posters with information on construction process and environmental protection activities	Minutes of meetings Evidence of presence of posters (photos) Grievance form and register
Collaboration with local police on exchange of information to prevent legal misconduct.	DEIA		Construction contractor	Community Health and Safety Management Plan	Availability of meeting notes / evidence of communication/exchange of information with local police	Minutes of meetings
Alcoholic drinks shall be prohibited at workplaces.	DEIA		Construction contractor	Community Health and Safety Management Plan	Number of grievances Presence of alcoholic drinks	Inspection records Grievance form and register
Training for construction staff and provide regulations, prevention measures on HIV / AIDS and other infectious diseases in collaboration with local hospitals.	DEIA		Construction contractor	Community Health and Safety Management Plan Training Plan	Availability of Training Plan, check that it covers HIV/AIDS and other infectious diseases prevention measures Check training register/records	Training register/ records
Contractors shall undertake community liaison in advance of works to ensure that the local community and road users are aware of the risks associated with construction sites.	Supplementary ESIA		Construction contractor	SEP	Availability of Construction SEP and evidence of meetings held	Minutes of meetings
Community awareness and responsibility training (that includes instruction on sexual harassment, conduct, and health, gender and local culture and traditions) will be included as part of the induction programme for all Project contractors and their workforce.	Supplementary ESIA		Construction contractor	Community Health and Safety Management	Availability and content of community awareness and responsibility training, and training records/register	Training records/register Grievance form and register

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
All contractors/workforce employees and subcontractors will be issued with a Code of Conduct addressing expectations and punitive measures concerning their discipline and behaviour (including for inappropriate sexual fraternisation) in project-affected communities.				Plan Training Plan Code of Conduct Project/ Construction SEP	Availability of Code of Conduct Check whether training has been included in induction training Number of community grievances	
Develop and implement a fully coordinated stakeholder grievance mechanism, which represents a simple complaints and reporting procedure. This shall be widely publicised to and accessible to community members at Project sites to support the reporting and redress of any transgressions, sexual or otherwise as well as other Project grievances. Reporting of grievances and resolutions proposed to be reported to PIU as a minimum in monthly reports.	Supplementary ESIA		MRTD/PIU	Project/ Construction SEP	Check whether stakeholder grievance mechanism has been disclosed and implemented Number and type of grievances Check that the grievances and resolutions are reported to PIU on monthly basis	Grievance form and register
Contractors will be required to undertake a due diligence investigation for all security personnel and organisations to be used.	Supplementary ESIA		Construction contractor	Labour Management Plan	Check whether the due diligence investigation has been undertaken	Due diligence record for security personnel and organisations
Labour and working conditions - labour conditions						
HR policy and Labour Management Plan will be readily available and understandable to all employees, and set out its approach to managing employees, including rights under Mongolian labour and employment law, and employee rights to join worker organisations and bargain collectively.	Supplementary ESIA		Construction contractor	Labour Management Plan	Availability of HR policy and Labour Management Plan Availability of Employee Grievance Mechanism	Inspection record Employee Grievance Form and Register
Formal Project and contractor Project labour grievance mechanism to be set up and maintained. Reporting of grievances and resolutions proposed to be reported to PIU as a minimum in monthly reports.	Supplementary ESIA		Construction contractor	Labour Management Plan	Availability of Employee Grievance Mechanism Number of grievances Check that the grievances and resolutions are reported to PIU on monthly basis	Employee Grievance Form and Register
Security shall be hired to guard camps and shall be available for prompt communication with workers.	DEIA		Construction contractor	Labour Management Plan	Check that security staff is hired and available	Inspection record
Establish regulations to ensure discipline.	DEIA		Construction contractor	Labour Management Plan Code of Conduct	Availability of Code of Conduct, and register of misconduct/breach of discipline	Register of misconduct/ breach of discipline

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Ensure food safety, drinking water quality and hygiene and impose regular control.	DEIA		Construction contractor	Labour Management Plan	Check that the food and potable water have been supplied by licensed organisations Check documentation confirming that the potable water meets potable water standards Check that the hygiene	Inspection record
Worker camps will be established in accordance with EBRD/IFC guidance: Workers' accommodation: processes and standards[7]. Prepare for approval by PIU a Camp Management Plan prior to construction. Code of Conduct to include measures for construction camp living.	Supplementary ESIA		Construction contractor	Workers' Camp Management Plan Code of Conduct Labour Management Plan	Availability of Workers' Camp Management Plan and Code of Conduct Availability of Employee Grievance Mechanism Number of grievances	Inspection record Employee Grievance Form and Register
Labour and working conditions - Occupational Health and Safety						
Contractor management systems to follow the Project ESHS and be aligned with international standard OHSAS 18001 and developed in alignment with EBRD PR2 – Labour and Working conditions.	Supplementary ESIA		Construction contractor	Labour Management Plan	Check that the management systems meets the Project ESHS and is aligned with ISO 45001 and EBRD PR2 and PR4	Inspection records
Provide, implement and disseminate a detailed OHS plan. Requirements to include (but not to be limited to): • Site Rules • Job and task specific hazard analysis and controls for all activities. • Requirements for and enforcement of PPE use. • Safety training for personnel. • Develop and implement an emergency response procedure. • Oversight of contractor OHS development / implementation, including mandatory reporting to PIU. • Maintain statistics of total work hours, lost time, incidents, injuries, near misses etc. • Toolbox talks to share information on risks, accident prevention, etc. • Ensure no prohibited materials such as asbestos containing materials (e.g. pipes) are procured or used.	Supplementary ESIA		Construction contractor	OHS Plan	Availability and content of the OHS plan	Inspection records Incidents and Accidents Form and Register

[7] EBRD/IFC (August 2009), Workers' accommodation: processes and standards. A guidance note by IFC and EBRD. Available at: https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_gpn_workersaccommodation

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Conduct regular safety training for operators.	DEIA		Construction contractor	Labour Management Plan	Check that the operators receive safety training	Training records/register
Do not allow employees to work in extreme weather conditions. Provide workers with proper rest and breaks.	DEIA		Construction contractor	OHS Plan	Daily check of weather conditions and work schedule Check of worker conditions	Inspection records Grievances
Undertake staff health checks – periodic physical checks for all construction staff.	DEIA		Construction contractor	OHS Plan	Check the schedule of medical records	Schedule of medical records
Workers to not work more than 8 hours per day in a noisy environment; and not to work in more than 55 dB without using ear protection. Provide workers with noise protection equipment.	DEIA	Law on Occupational Safety MNS 0012.4.005:1985. MNS 5002:2000 MNS 12.1.016:1988	Construction contractor	OHS Plan	Check that workers have been provided PPE Daily noise monitoring at workplace	Inspection records Monitoring records
Labour and working conditions - Emergency Preparedness						
Provide, implement and disseminate a detailed Emergency Preparedness and Response Plan detailing preventative measures for all types of incidents covered in the plan. It should include as a minimum: ○ Identification of potential emergencies and risk assessments e.g. spills, fires, collisions, worker injury ○ Roles and responsibilities ○ Development of procedures to respond to identified emergencies ○ Equipment required e.g. first aid facilities, firefighting equipment, etc. ○ Testing and inspection regimes for emergency equipment ○ Muster points. evacuation routes ○ Training requirements ○ Communication protocols to workers, public and other affected parties ○ Location of nearest medical facilities ○ Update and review cycle ○ Mitigation measures for flooding from snow melt, accidents and natural disasters (fire flood, lightening, earthquake)	DEIA, Supplementary ESIA		Construction contractor	Emergency Preparedness and Response Plan	Availability of the Emergency Preparedness and Response Plan	Inspection records Incidents and Accidents Form and Register

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
This plan should be developed and implemented in liaison with local community members, authorities and emergency services, and cover the requirements of PR4. This Plan be in place prior to construction commences on site.						
Establish spill management plan.	DEIA		Construction contractor	Spill Prevention and Response Plan	Availability of Spill Prevention and Response Plan and procedures	Incidents and Accidents Form and Register
Use sawdust or synthetic absorbent material (TSSW50W) at the oil product storage places, vehicle wash and maintenance areas.	DEIA	MNS 5850-2008	Construction contractor	Spill Prevention and Response Plan	Availability of Spill Prevention and Response Plan Weekly inspections of oil storage areas	Inspection records
Prompt vehicle maintenance.	DEIA		Construction contractor	Traffic Management Plan	Check schedule of vehicle maintenance works Inspect daily construction vehicle and plant records	Vehicle and plant inspection records
Oil storage/distribution to follow national standards “Petroleum product supply technology and operating procedures MNS 4633:2006” and “General technical requirements for Petrol Station and equipment MNS 4633: 2006.	DEIA	MNS 4633: 2006 MNS 4633: 2006	Construction contractor	Spill Prevention and Response Plan	Availability of Spill Prevention and Response Plan Weekly inspections of the oil storage and distribution areas	Inspection records
Infrastructure and Services						
Provide details on resource use and efficiency and include within Construction ESMMP. This should identify sources of energy and water. Liaise will suppliers as necessary to avoid impacts on local provision.	Supplementary ESIA		Construction contractor	Lot-specific Construction ESMMP	Availability of information on efficient use of resources	Inspection records
As part of the Emergency Preparedness and Response Plan, identify suitable health facilities for workers in liaison with local health facilities to ensure demand is not to detriment of local users. Requirements for local health facilities will be carefully coordinated.	Supplementary ESIA		Construction contractor	Emergency Preparedness and Response Plan	Check that local health facilities have been identified, and capacity of health facilities has been estimated	Inspection records
Gender						
Provide equal opportunities for women in line with HR policy and Labour Management Plan (see above).	Supplementary ESIA		Construction contractor	Labour Management Plan	Availability of HR policy and Labour Management Plan Number of women employed as % of construction workforce	Inspection records

Table 6-3. Post-construction and pre-handover environmental and social mitigation management measures

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Rehabilitation of soils						
Execute site cleaning and technical rehabilitation at deviation and access roads, campsites and at the borrow and quarry sites. All affected areas, including embankment sides, shall be rehabilitated and revegetated. All wastes shall be removed from the project corridor, all ancillary sites and any other locations the contractor has stored waste. Waste to be disposed of in permitted sites.	DEIA		Construction contractor	Reinstatement Plan Materials and Waste Management Plan	Availability of the Reinstatement Plan and Materials and Waste Management Plan Inspection of deviation and access roads, campsites and borrow and quarry sites Inspection of the affected areas including embankment sides	Inspection records
Rehabilitation conducted in accordance with DEIA Section 6.2 (see Appendix A). This includes: • Selecting seeds for biological rehabilitation that fits to the future land use. • Areas to be revegetated shall be covered with fertile soil. • Aftercare of planted seeds. • Surfaces shall be re-contoured in line with the planned future use of the rehabilitated area. • Special areas for small animals, rodents and insects shall be considered as part of the biological rehabilitation. • Recontour all borrow pits in accordance with DEIA requirements.	DEIA		Construction contractor	Reinstatement Plan	Availability of the Reinstatement Plan Inspection of the rehabilitated sites	Inspection records/reports
Undertake revegetation only with native species; soum to advise.	Supplementary ESIA	Road construction norm БНбД 32-02-00” Law on Plant Protection. Clause 7.2, 7.5, 7.6-р зүйл. Law on Environmental Protection. Clause 31.	Construction contractor	Reinstatement Plan	Availability and content of Reinstatement Plan	Communication protocols Inspection records
Natural run-off routes must be rehabilitated as soon as possible and as close as possible to original state.	DEIA		Construction contractor	Reinstatement Plan	Availability of Reinstatement Plan Detailed description of natural run-off routes before start of the	Inspection records

Mitigation Measure	Source	Regulation	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
					construction works Inspection of the rehabilitated areas with regard to run-off routes	
Hand over the wells created for road construction to local authorities in good condition.	DEIA		Construction contractor	Water Management Plan	Inspection of well condition before transfer to local authority Availability of documentation confirming that wells have been accepted by local authority	Inspection records

Table 6-4. Operation phase environmental and social mitigation management measures

Mitigation measure	Source	Regulation (if applicable)	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Surface water and groundwater contamination						
During O&M activities, spill kits shall be kept in accessible locations at all times, and employees trained in their use and disposal; implementation of the Spill Prevention and Response Plan in the event of a spill.	Supplementary ESIA		Operation and maintenance (O&M) contractors	Spill Prevention and Response Plan	Availability of: Spill Prevention and Response Plan and related training program Check availability of the spill kits	Training records Inspection records
Flood risk						
Regular maintenance/cleaning of culverts to remove debris.	DEIA		MRTD/ O&M contractors	O&M Plan	Monthly operation/maintenance inspections of the culverts	Inspection records
At points where road culverts are not installed, flood flows shall be directed to the nearest culvert points with well planned drainages or trenches. Inspection and reinstatement following major flood event.	DEIA		MRTD/ O&M contractors	O&M Plan	Inspection of system for performance Visual inspections after intensive rains and snow melting	Inspection records
Drainage system, sediment and erosion controls, including appropriate drainage systems, will be routinely inspected and maintained to manage runoff. Adequate discharge of drainage will be provided from the central median of the road.	Supplementary ESIA		MRTD/ O&M contractors	O&M Plan	Inspection of system for performance	Inspection records
Operation and maintenance wastes						
Development and implementation of an O&M Plan that addresses waste management from maintenance activities. Waste management procedures for operation and maintenance should include: ○ provision of regular training for staff on recycling and waste reduction and the practices necessary to	Supplementary ESIA		MRTD	Waste Management in O&M Plan	Availability of O&M Plan Inspection of waste management along road	Inspection records Waste records

Mitigation measure	Source	Regulation (if applicable)	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
minimise waste and facilitate good practice waste management. ○ Provision of a dedicated area for the storage of hazardous waste arisings (including clinical waste, batteries and WEEE). ○ Recycling of vehicle and plant maintenance waste i.e. oil or grease contaminated filters and recycling or re-use of empty chemical containers or bags. ○ Removal of remaining hazardous waste by a specialist licensed company.						
Dedicated budget from the relevant authority to supply and service waste collection bins and signage for the public at all locations; this is a requirement of the Mongolian Law on Waste and is the responsibility of the Soum authorities.	Supplementary ESIA	Mongolian Law on Waste	Operation and maintenance (O&M) contractors	O&M Plan	Twice yearly check the availability of waste collection bins and signage at public locations	Inspection records
MSW waste should be gathered on a regular basis and stored in closed containers until recycled or disposed of as per the local legal requirements.	Supplementary ESIA		Operation and maintenance (O&M) contractors	Waste Management in O&M Plan	Monthly inspection of the MSW storage areas Check the availability of waste permits/licences of the companies responsible for waste disposal	Inspection records Waste permits/licenses
Noise						
Ensure noise mitigation measures (e.g. noise barriers) are incorporated into the design in for the locations, where the noise levels above established limits, resulting from the road widening and increased traffic – this applies to noise sensitive receptors (e.g. residential properties) that are not subject to current or future resettlement. Undertake post-construction noise monitoring in the residential areas at noise sensitive receptors and, in case of the noise level exceedances, provide additional noise mitigation measures (e.g. barriers).	Supplementary ESIA		MRTD	O&M Plan Grievance Mechanism	Evidence of noise mitigation measures Number of grievances	Inspection records Grievance Form and Register
Air quality						
If necessary, undertake post-construction air quality monitoring in the residential areas to confirm no exceedances of legislation as a result of increased traffic. Implement mitigation as necessary, should exceedances be recorded.	Supplementary ESIA		MRTD	O&M Plan Grievance Mechanism	Evidence of air quality mitigation measures Number of grievances	Inspection records Grievance Form and Register
Fauna						

Mitigation measure	Source	Regulation (if applicable)	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Additional signs should be placed warning motorists of potential collision risk and speed restrictions applied to known fauna corridors (based on the advice of the wildlife survey expert).	Supplementary ESIA		MRTD	O&M Plan	Check whether known fauna corridoes are mapped out and signs are in place indicating speed limits in known fauna corridors	Inspection records
Spring time inspection and maintenance of road corridor fencing.	Supplementary ESIA		MRTD	O&M Plan	Check whether fencing is in tact	Inspection records
Community Health, Safety and Security, Livelihoods						
Collaboration with local police on exchange of information to prevent legal misconduct.	DEIA		MRTD	Community Health and Safety Plan	Availability of Community Health and Safety Plan and meeting notes Evidence of communication/ exchange of information with local police	Meeting notes
Appropriate signage on approach to animal crossing and use of reflective collars on large livestock (e.g. cows)	DEIA		MRTD	Community Health and Safety Plan	Inspection of the signage on approach to animal crossing	Appropriate signage
Provision of appropriate road restraint systems that protect errant vehicles from drops, ditches and unprotected roadside objects such as signs and heating pipelines. This is especially relevant given the intended dual carriageway layout as vehicles will likely be maintaining 100 kph speed limit for longer periods than under the existing single carriageway layout.	Supplementary ESIA		MRTD	Community Health and Safety Plan	Check that appropriate road restraint systems are in place and monitor their performance / accident black spots	Inspection report Accident records
Appropriate inspection and maintenance regime implemented upon completion of construction.	Supplementary ESIA		MRTD	Community Health and Safety Plan	Check schedule and results of the inspection and maintenance works in relation to road surface resistance to extreme temperatures	Inspection and maintenance records
Educational meetings with local communities and media adverts in relation to driver behaviour and speed limits and also locally, to help make drivers aware of the new road layout when complete. Educational meetings in relation to livestock use of the road, in particular herder households should be informed about potential collusions and penalties imposed by relevant law.	Supplementary ESIA		MRTD	Project SEP	Availability of O&M SEP and meeting notes	Meeting notes
Monitor for adequate design for pedestrian crossings (including vulnerable people) and traffic calming measures in urban areas, and provision of shelters, protective barriers, pavements and street lighting along all high pedestrian use road sections.	Supplementary ESIA		MRTD	Community Health and Safety Plan	Inspection of pedestrian crossings and availability of signs indicating speed limits in urban areas	Inspection records Accident records
Provision of grate drain covers over drains to prevent the risk of accidents and the ingress of rubbish into the drains which then cause blockages and flooding.	Supplementary ESIA		MRTD	O&M Plan	Check availability of the grate drain covers	Inspection records

Mitigation measure	Source	Regulation (if applicable)	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Ensure appropriate vehicle containment measures are provided at bridge parapets and culverts (and any other proposed structures) within the proposed design.	Supplementary ESIA		MRTD	O&M Plan	Check availability and performance of the vehicle containment measures at bridge parapets	Inspection report
Ongoing maintenance and repairs, including maintenance of drainage channels for the enhancement of road longevity and to maintain community health and safety e.g. filling subsidence voids and cracks, and levelling obtrusions on affected road and pavement sections to avoid risk of accidents.	Supplementary ESIA		MRTD/ O&M contractors	O&M Plan	Check schedule and results of O&M works	Inspection records
Labour and working conditions - *Labour conditions*						
Prepare and implement a detailed O&M Plan incorporating OHS and emergency preparedness and response.	Supplementary ESIA		MRTD	O&M Plan Emergency Preparedness and Response	Availability of detailed O&M Plan incorporating OHS and emergency preparedness and response	Inspection records
Operational HR policy and Labour Management Plan to be readily available and understandable to all employees, and set out its approach to managing employees, including rights under Mongolian labour and employment law, and employee rights to join worker organisations and bargain collectively.	Supplementary ESIA		MRTD/ O&M contractors	Labour Management Plan	Check the availability of the HR policy and Labour Management Plan	Inspection records
Formal labour grievance mechanism to be set up and maintained.	Supplementary ESIA		MRTD/ O&M contractors	Project SEP	Check implementation of labour grievance mechanism	Grievance form and register
Infrastructure and Services						
Review provision of health services and budget for serious RTAs along the road.	Supplementary ESIA		MRTD	O&M Plan	Check availability of health care facilities and budget	Inspection report
Gender						
Provide equal opportunities for women in line with HR policy and Labour Management Plan.	Supplementary ESIA		MRTD/ O&M contractors	Labour Management Plan	Check that equal opportunities for women has been covered in HR Policy and Labour Management Plan % of women in the workforce	Inspection records
Adequate policing to reduce the risk of unwanted social behaviour from increased truckers along the route on the local community in particular women and young girls.	Supplementary ESIA		MRTD	O&M Plan covering Community Health and Safety Grievance mechanism	Check the register of grievances	Community Grievance Form and Register

Mitigation measure	Source	Regulation (if applicable)	Responsible party	Management Plan, if applicable	Verification method / Monitoring of compliance	Reporting format
Traffic Road Safety						
Develop and implement a program of road safety audits to assess safety performance along the alignment and village access roads, and to identify any unsafe conditions. This should include a Road Safety Audit at Pre-Opening/Post Construction to confirm recommendations accepted during the design stage Road Safety Audit have been implemented. A further Road Safety Audit should be undertaken 12 months post opening and then periodically every 3 years to assess road traffic collisions along the road and identify any trends/blackspots that required remedial actions.	Supplementary ESIA / Road Safety Report		**MRTD**	**O&M Plan**	Pre-opening/Post construction Road Safety Audit Road Safety Audit After 12 months of opening. Road Safety Audit every 3 years thereafter.	Road Safety Audit Reports

7. Environmental Monitoring

7.1. Introduction

Through the ESMMP, the MRTD/PIU and Construction contractors will establish an Environmental and Social Monitoring Programme. Monitoring of Project activities will be undertaken in order to:

- Ensure the Project is implemented in compliance with national requirements and EBRD PRs;
- Monitor changes to baseline conditions during construction;
- Assess the efficiency of mitigation actions;
- Provide information on environmental and social performance to Lenders and permitting authorities as required; and
- Implement corrective actions, if required, if proposed mitigation measures are unable to eliminate/reduce potential construction related impacts.

7.2. Monitoring Plan

A detailed monitoring plan will be prepared by the Construction contractor with specified targets for each indicator, which will be tailored to each Lot. Monitoring should cover the following topics:

- Air quality;
- Noise;
- Surface water;
- Groundwater;
- Soil Quality;
- Plant cover; and
- Road Safety.

Monitoring requirements are presented in Table 7-1.

Table 7-1. Environmental monitoring plan

Project Phase	Parameters	Location	Periodicity	MNS
Air Quality	SO_2, CO, NO_2	At sensitive receptors along the route, including within the towns.	Once, prior to construction	MNS 4585:2007 MNS 5013:2001
		At a minimum of 20 spots in the project area to correlate with the baseline locations monitored.	Monthly	
		Active construction spots	Monthly	
	Dust emission PM_{10}, $PM_{2.5}$	At sensitive receptors along the route, including within the towns.	Once, prior to construction	
		At 20 spots in the project area	Monthly	
Noise	Noise and vibration levels in ambient air	At sensitive receptors along the route, including within the towns.	Once, prior to construction	MNS 4585:2007 MNS 5002:2000
		At sensitive receptors along the route, including within the towns.	Monthly	
		At sensitive receptors along the route, including within the towns.	1 year after project operation and every 5 years thereafter	
	Noise emission levels of equipment and machinery	All construction vehicles	Regularly	

Project Phase	Parameters	Location	Periodicity	MNS
Surface Water	Surface water quality: chemical and heavy metals analysis	Bornuur lake, Kharaa river, Saikhan river, Bayangol river	Monthly	MNS (ISO) 4867:1999 MNS (ISO) 5667-1:2002
Groundwater	Detailed chemical and heavy metals testing	Nearby water wells	Quarterly	MNS 0900:2005 MNS 6148:2010 MNS (ISO) 4867:1999 MNS (ISO) 5667 11:2000 MNS (ISO) 5667-1:2002
Soil Quality	Heavy metals contamination analysis	Up to 28 points along the road corridor	Prior to start of construction for baseline Quarterly	MNS 5850:2008 MNS 3298:1991
Plant Cover Monitoring	Number and composition of species, biomass, growth rate and density	Up to 28 points along the road corridor	Prior to start of construction for baseline Once a year	N/A
	Percent (%) of pastureland species and change Percent of anthropogenic species (%) Plant productivity change (%)	Nearby grazing areas	Prior to start of construction for baseline Once a year	MNS 5546:2005
Road Safety	Road safety as required for road safety audits to identify any unsafe conditions	Safety performance along the road alignment and village access roads	Road Safety Audit at Pre-Opening/Post Construction to confirm recommendations accepted during the design stage Road Safety Audit have been implemented. A further Road Safety Audit should be undertaken 12 months post opening and then periodically every 3 years to assess road traffic collisions along the road and identify.	N/A

8. Training and Awareness

8.1. Introduction

A key component of the success of the ESMMP depends on effective capacity building and the training of all Project employees, including sub-contractors.

8.2. Code of Conduct

A Project Code of Conduct will be prepared by the MRTD/PIU. This will be applicable to all contractors, subcontractors and site visitors.

8.3. Construction Phase Training

8.3.1. Training Plan

ESHS training sessions will be organised in accordance with a Training Plan developed by the Construction contractor and approved by the MRTD/PIU. The Plan will outline training requirements, topics and areas of capacity building, and the staff who require on the job training. The initial training plan will be prepared and approved prior to the commencement of construction works. Training will be reviewed monthly, annually and on a needs basis.

During construction, the contractor ESHS Manager will update and implement the Training Plan. Training records will be maintained for each employee, to provide evidence for auditing/inspection purposes.

8.3.2. Induction Training

The Construction contractor will ensure that all workers have been inducted. All new employees will receive site induction to appraise them of ESHS aspects on site, the basic rules of work on site and the use of PPE and the prevention of injury to fellow employs.

Induction will also cover the following topics:

- ESHS Policies
- Project Standards
- Code of Conduct
- Environmental and social risks and impacts of Project activities
- ESHS instructions and ESMMP
- Emergency Preparedness and Response Plan

After Induction, Project personnel will receive an Employee Handbook that contains information on employee training, emergency telephone numbers and basis ESHS requirements.

Personnel required to visit the construction site must also complete the site induction. Generic induction will consist of basic hazard awareness, safe work practices, and emergency procedures for fire, evacuation, etc.

8.3.3. Project Training

8.3.3.1. ESHS and ESMMP

All those involved in the management and implementation of any aspect of the Project ESHS and Project/Lot-specific Construction ESMMPs will be adequately trained. Training should include:

- Why the environment needs to be protected and conserved;
- How construction activities can impact on the environment;
- What can be done to mitigate such impacts;
- Awareness of the ESMMP;

- Awareness of the emergency preparedness and response plans; and
- Social responsibility during construction e.g. being considerate to local residents.

8.3.3.2. Job-specific

Prior to commencement of new assignments all workers will receive adequate training and information covering:

- Knowledge of materials, equipment, and tools;
- Potential risks to health;
- Precautions to prevent exposure to potential health risks;
- Hygiene requirements;
- Use of task specific PPE; and
- Appropriate response to operational incidents and accidents.

Where necessary, training will be provided for employees carrying out specific job functions to educate and train them on topics, such as PPE use, safe driving, working in confined spaces, handling hazardous materials, etc.

8.3.3.3. Toolbox Talks

Toolbox talks will be held as necessary to address specific issues before commencing work. For specific situations, where necessary external training experts will be invited to provide technical support.

8.4. Operation Phase

The requirements for training during O&M will be determined by the MRTD and included in the O&M Plan.

9. Monitoring of Compliance, Auditing and Reporting

9.1. Requirements for Compliance Monitoring

All controls, inspections, audits and reporting will be undertaken in accordance with the Project ESHS requirements and procedures. These requirements should be reflected in the Construction contractor Lot-specific Construction ESMMP.

9.2. Inspections and Internal Audits

During construction, site inspection/monitoring will be undertaken by the Construction contractor to ensure that works are being undertaken in conformance with the requirements of the Project ESHS and Lot-specific Construction ESMMP. These inspections will be undertaken on a daily, weekly and monthly basis by the roles identified in the Lot-specific Construction ESMMP, and will be recorded using Checklists, Forms and Registers. Any non-conformances will be recorded, and appropriate corrective measures undertaken by the Construction contractor.

Internal audits will be conducted by the Construction contractor ESHS Manager on the Lot-specific Construction ESMMP to assess its effectiveness and relevance as follows:

- A full annual review:
- Following a reportable incident, or a significant non-compliance; and
- Following an addition, up-date or change order to the ESMMP.

9.3. External Audit Reporting requirements

During construction the Construction contractor will report to the MRTD/PIU. The format for reporting will be agreed between the MRTD/PIU and Construction contractor, however Table 7-1 provides an overview of the ESHS reporting, responsible party and frequency of submissions. The reporting format will be reviewed at least semi-annually.

Table 9-1. ESHS reporting requirements

Type of report	Report	Responsibility	Frequency	Submit to
Checklists	Inspection records	Construction contractor ESHS Lead	As required	MRTD/PIU
Forms and registers	Waste management and disposal documentation	Construction contractor ESHS Lead	As required	MRTD/PIU
	Non-conformances/ Accidents/ Incidents Forms and Registers	Construction contractor ESHS Lead	As required	MRTD/PIU
	Chance Finds Form	Construction contractor ESHS Lead	As required	MRTD/PIU
	Community Grievance Forms and Registers	Construction contractor ESHS Lead	As required / Monthly	MRTD/PIU
	Labour Grievance Forms and Registers	Construction contractor ESHS Lead	As required	MRTD/PIU
Project Reports	Pre-Construction Report	Construction contractor ESHS Lead	Once	MRTD/PIU
	Project Performance Report	Construction contractor ESHS Lead	Monthly or as agreed	MRTD/PIU
	Post-construction Restoration Report	Construction contractor ESHS Lead	Once	MRTD/PIU
	Project Performance Report to EBRD	MRTD/PIU ESHS Lead	Monthly or as agreed	EBRD

9.4. Accidents, Incidents and Non-conformances

During construction, the Construction contractor will implement a Non-Conformance and Corrective Action Procedure to ensure that all non-conformances are identified and recorded, and that appropriate corrective action is taken to rectify all identified non-conformances, preventing their reoccurrence in the future.

During construction, the Construction contractor will also implement an Accident, Incident and Near Miss Procedure to ensure that environmental incidences and health and safety incidences and accidents, including near-misses, are identified and recorded, and that appropriate corrective action is taken to prevent reoccurrence in the future.

During operation, the MRTD will follow a similar procedure, in accordance with their existing internal practices and as agreed with EBRD.

9.4.1. Non-conformance procedures

A non-conformance is a deviation from:

- Project policies and procedures;
- Project permits/licenses; and
- Project requirements as set out in ESMMP.

Non-conformances may be identified through the following activities:

- Daily/weekly/monthly site inspections/monitoring, and recorded in the Checklists/Inspection records;
- Third party audit findings;
- Accidents, Incidents and Near-misses;
- Meetings notes;
- Performance reviews; and
- Grievances (internal or external).

Where necessary, a Corrective Action will be identified to address a Non-conformance. The Corrective Action can be a remedial action to address the immediate problem and, where necessary, further action to understand the root cause of the problem and identify further action required to address the root cause.

All Non-conformances and Corrective Actions will be reported in a Non-conformance and Corrective Action Form and Register.

9.4.2. Accident/Incident procedures

All accidents and incidents (including accidents, spills, work-related illnesses, damages, near misses, etc) will be reported in the Accident and Incidences Form and Register.

The following procedure will be followed:

- If an accident/incident/near miss occurs, the Site Manager must be alerted immediately, and immediate action must be taken to minimise the impact or the potential impact. Depending on the nature of the accident or incident, the following will need to be employed:
    - Emergency preparedness and response plan and procedure
    - Spill emergency response procedure
- Once the immediate accident/incident/near miss has been addressed, the Site Manager must advise the ESHS Manager.
- MRTD/PIU should also be informed of the accident/incident, in accordance with procedures agreed within the Construction contractor.
- The Site Manager will complete as far as possible an Accident, Incident and Near Miss Form, which will be submitted to the ESHS Manager.
- The ESHS Manager will review and complete the Form.
- The ESHS Manager will maintain a Register of all Accidents, Incidents and Near Misses.

- The ESHS Manager and Site Manager and other nominated persons as necessary, will determine what further action or investigation is required, and record this on the Accident, Incident and Near Miss Form.
- Subsequent investigation and verification activities will be undertaken by the nominated person(s) to determine the root cause(s) of the incident or accident.
- Once the cause is identified, the corrective action is to be documented in a Corrective Action Form. The Corrective Action Form will identify the corrective action required and the person responsible for delivering the action, together with an agreed timeframe for implementation. The Corrective Action Form reference number is to be added to the Accident, Incident and Near Miss Form by the ESHS Manager.
- Following implementation of the corrective action, a review of the effectiveness of the corrective action will be undertaken by the ESHS Manager or nominated representative.
- Where investigation indicates that the accident/incident/near miss arose as a result of a non-conformance, this will also be logged by the ESHS Manager in the Non-Conformance and Corrective Action Register.
- On the successful closure of the implementation of corrective actions, the Corrective Action Form will be signed off by the ESHS Manager and Site Manager, and the updated to “action closed”. The Accident, Incident and Near Miss Register and, as necessary, Non-Conformance and Corrective Action Register will be updated by the ESHS Manager.

For any serious accidents or incidents, the Construction contractor will complete an Accident Report within two weeks for submission to the MRTD/PIU.

10. Implementation Schedule

Table 10-1 provides a summary of the main actions and implementation schedule for the development of the ESMMP by the MRTD/PIU and Construction contractor.

Table 10-1. Summary of main actions for implementation

Action	Responsibility	Time
Ste up PIU and identify ESHS lead	MRTD	Prior to construction
Develop and implement an integrated Project ESHS. This will include: • Policies • Project ESMMP, covering plans and procedures • Permit register • Project SEP • Project LARP • Roles and roles and responsibilities (including clear management of interfaces) • Project schedule/programme	MRTD/PIU	Prior to construction
Undertake pre-construction surveys – archaeology and ecology	MRTD/PIU	Prior to construction
Develop Project SEP	MRTD/PIU	Prior to construction
Provide LARP	MRTD/PIU	Prior to construction
Implement Project SEP	MRTD/PIU	Prior to and during construction
Develop detailed Lot-specific Construction ESMMP	Construction contractors	Prior to construction
Develop Training Plan	Construction contractors	Prior to construction
Identify ESHS Lead and team	Construction contractors	Prior to construction
Undertake pre-construction baseline monitoring and prepare pre-construction report	Construction contractors	Prior to construction
Prepare Lot-specific Construction SEP	Construction contractors	Prior to construction
LARP, if required	Construction contractors	Prior to construction
Maintain permit register and obtain permits	Construction contractors	Prior to construction
Implement Lot-specific Construction ESMMP	Construction contractors	During construction
Implement Lot-specific Construction SEP	Construction contractors	Prior to and during construction
Implement Training Plan	Construction contractors	Prior to and during construction
Inspections and monitoring	Construction contractors	During construction
Construction performance reporting	Construction Contractors to MRTD/PIU	During construction
	MRTD/PIU to EBRD	During construction
Post-construction rehabilitation and Reinstatement Report	Construction contractors	Post-construction and prior to handover
Develop O&M Plan	MRTD/PIU	Prior to operation
Implement Project SEP	MRTD/PIU	During operation
Implement Training Plan	MRTD/PIU	During operation
Implement O&M Plan	MRTD/PIU	During operation
O&M performance reporting	MRTD/PIU to EBRD	During operation

Appendices

Appendix A. Rehabilitation program

6.0 Rehabilitation

This section provides rehabilitation methodology, relevant standards, norms and regulations as well as rehabilitation budget estimations for the “4 Lane UB-Darkhan road construction” project. As stated in the Law on Environmental Protection, the Law on Minerals, the Law on Environmental Impact Assessment, and other legislative acts, road construction entity shall execute rehabilitation of damaged land sites in accordance with national standards MNS 5915: 2008, MNS 5916: 2008, MNS 5917: 2008. Reclamation costs are calculated in accordance with the "Methodology for estimating the rehabilitation work” which was endorsed as attachment to the A-138 Order of the Minister of Environment and Tourism on March 30, 2015.

6.1 Bill of quantity for the road upgrade works

Within the construction of the 4 lane Ulaanbaatar-Darkhan road, 221.79 hectares of land will be damaged due to borrow and quarry operation works and various other earthworks during the construction phase. After completion of the construction work, technical and biological reclamation will be undertaken at the damaged or degraded sites.

Table 6-1. Size of areas affected by the construction works

№	Description	Quantity and dimension	Size of affected area, hectares
1	Deviation road (temporary road for passengers)	7m wide x 149.7 km long	104.79 ha
2	Access and temporary road for construction vehicles	2-4km distance between the road alignment and the 11 borrow sites, 1-2km distance between worker campsites and the road alignment.	30.1 ha
3	Borrow pits and quarry sites	11 borrow sites with each site occupies 4 hectares of land	44 ha
4	Rehabilitation of worker campsites	5 main camp sites, each has up to 1 hectares of area, 5 sub-camps, each with up to 0.5 hectares of land	7.5 ha
5	Rehabilitation at mixing plants, crushers sites and batch plants	Each site occupies 1 hectares of area	4 ha
6	Rehabilitation of topsoil stockpile spots		31.4 ha
	Нийт дүн		**221.79 га**

6.2 Methodology of the rehabilitation works

Rehabilitation and revegetation of the affected land sites thereby allowing public use in the future are the key purposes of rehabilitation works for the project.

Rehabilitation will be undertaken in three phases: pre-construction, construction and post-construction. The following steps for rehabilitation of the project are as follows: These include:

- **During the pre-construction phase**
- Deviation road to be selected in a way as less amount of topsoil as possible to be stripped off.
- Make arrangements with local authorities on temporary deviation roads
- Identify exact boundaries of topsoil stripping areas and amount of topsoil to be stripped.
- Make map of topsoil stripping areas.
- Develop a rehabilitation program based on the above studies.
- **Road construction phase**
- To topsoil stockpile which will later be used for rehabilitation
- Take measures to protect the stockpiled topsoil.
- Begin technical reclamation at sites where construction is completed
- **Post-construction phase**

Execute technical rehabilitation in affected areas

- Relocation of equipment and camps
- Select plant seeds for biological rehabilitation
- Re-vegetation that fits to the future land use /grazing area or settlement area/
- Nursing planted seed and watering

Evening of surfaces in line with the planned future use of the rehabilitated area.

- Cover with fertile soils

6.2.1 Topsoil stripping

The construction of the road will start with the removal of fertile soil. The stripped fertile soil will be used for later rehabilitation of the area, so it is important to carry out the activity in accordance with the technological procedures. Therefore, the removal of fertile soils and stockpiling will need to be in line with following principles. Strip the fertile layer of soil to separate the fertile layer and the subsoil layer.

The fertile layer of soil is used for biological reclamation purposes, for the improvement of fertile soil fertility and for technical reclamation purposes to re-fill the borrow pits. Prior to soil stripping, soil dehydration measures should be taken, and the waste and stone should be thoroughly cleaned.

Thickness of fertile layer shall be determined by the level of fertility at the bottom of the substrate (above the level of fertility of the low fertile land required to improve its fertility) the

fertility. Depending on the peculiarities of soil types and subtypes in the geographic area of the project area, usually a thickness of 20-30 cm is required to be stored in fertile soil stockpiles.

The precautionary measures should be taken in order to remove topsoil and store stockpiles for decay (to mix or contaminate with other rocks). Therefore, if stockpiles are stored for more than one year, they need to take measures to protect them from erosion and to preserve the micro-organisms by planting the surface of the perennial plant by seeding.

Once re-vegetated, fertile soil layers stored in stockpiles can be stored for up long term. Stripping shall be carried out during warm season. The topsoil and base soils can be transported by bulldozers and loaders to the stockpile area.

The spacing between the field of land-stripping work and the stockpile of topsoil and droplets, and the capacity of the machine required for the job, will be placed in stable storage area, without overloading the stockpiles. If the stockpile is located on the slopes or ravines, it will be flooded with rain and flood, thus the stockpile will be constructed to drain hydro-technical facilities, drainage channels or discharge into the water.

The topsoil stockpile should not be placed in windy locations. Because of the impact of the extraction process, large amounts of dust emerge as a result of polluting the air, limiting the visibility, and suppressing the surrounding soil. The topsoil shall be 5-10 m, not more than 2 m in height, 30-50 m in length, lateral slopes shall not exceed 20 degrees, and the top of the crown shall be compacted to a small dump.

Stockpiles shall be in 5-8 m the distance from each other to allow free movement of vehicles. Removal of topsoil will be done by bulldozer and loader.

Figure 6-1. Topsoil stripping with bulldozers

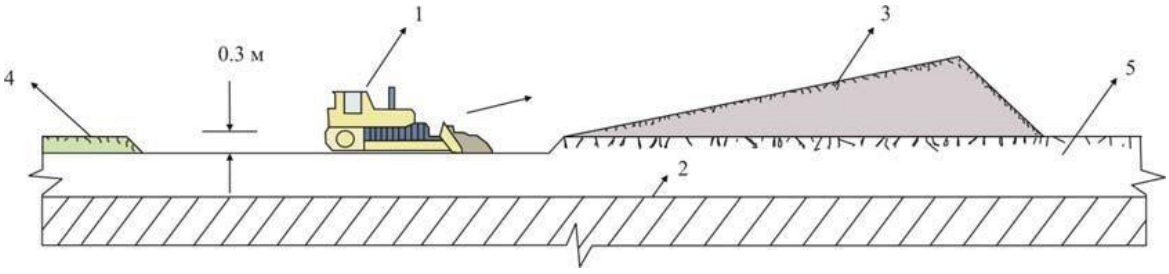


Table 6-2. Topsoil stripping mechanics

Stripping	Stockpiling
Stripping or digging with bulldozers.	Removing and stockpiling with loaders.

Topsoil storage: Topsoil topsoil will be stripped to 0.3 m thick and will be collected in topsoil stockpiles. Because topsoil is stored for more than two years, vegetation and slope of the

stockpile and lateral slopes will be vegetated by planting perennial plants in order to prevent MNS 5916: 2008 in topsoil handling and storage.

Use the irrigation method to vegetate the slope of the heap. Select the height of the topsoil stockpile depending on the size of the pile.

6.2.2 Creating topsoil stockpiles

Different layers of soil such as fertile layer, humus layers and humus accumulation layers shall be separately stockpiled. However, after removing the soil from humus accumulation, it is necessary to dispose of the humus accumulation layer at the bottom of the stockpile. The stockpiles are 5-10 m in height, not more than 2 m in length, 30-50 m in length, side slopes not more than 20 degrees, and the tops are compacted to a small dump. Stockpiles shall be in 5-8 m the distance from each other to allow free movement of vehicles..

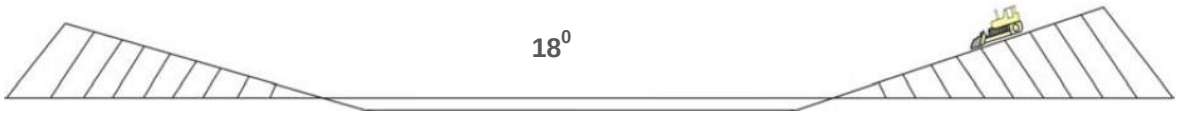
6.2.3 Pit slope

When executing technical rehabilitation, slopes of borrow pits shall be no more than 18^0. Limit the distance between the incline slopes to the slope angle. The distance of the slope angle between slopes should be as specified in the table below.

Table 6-3. Slope angles for pits

Slope angles, ^{0}	Maximum width, meters
7-9	100
9-11	80
11-13	50
13-15	30
15-20	15
20-25	8
Above 25	5

Figure 6-2. Rehabilitation of borrow pits



6.2.4 Reshaping of borrow pits

Shape the entire pit with consideration of the land use purpose for future.

Table 6-4. Slope angles for reshaping

Future land use types after rehabilitation	Required slope angle, ^{0}
Agricultural use, crop planting, grazing area	0-18

- In forming, create a slope angle as close as possible to the approximate land area, taking into account the landscape (landscape).
- Use the bulldozer, the extruder, the grinder and the scraper from the road technology machinery to be used in the form of queue.
- The surface of the formulated area, especially the slope, is sloped to the depth of 30-

50 cm as a bulldozer or gradient derivative. This protects against the leakage of topsoil over the sloping surface of the topsoil.

- Form the surface of the formulated area to prevent the movement of human and animals.

Table 6-5. Rehabilitation layers

Future land use type	Layers of rehabilitation (from top to bottom)
Agricultural use	▪Fertile soil layer ▪Typical soil layer ▪ Rock fill-up layer

Prior to the rehabilitation phase, the structural layer of biological rehabilitation in the chemical composition of the rehabilitation layer shall be covered with a layers or capillary-interrupted layers on the leveled surfaces. The thickness of the stalk layer can be approximate within the following range. These include:

- Clay (compacted) - 0.4 + 0.5 m;
- Sand - 0.5 + 1.0 m; peat - 0.5 + 0.8 m;
- Gravel pebbles - 0.4 + 1.0 m;
- Sandy loam soil - 1.0 + 1.5 m;
- Clay soil - 1.5 to 3.0 m.

Whenever possible, soil removal measures (such as plaster or plaster fertilizers) should be carried out in the top layer of the harmful rock layer if the materials are not available. Generally, the layers of 0.2- 0.3 m thickness of the bedrock are fertilized. If stockpiles are to be disposed of toxic rocks from soil stripping, they will be placed on the top of the stockpile to allow loose or flammable toxic rocks to be plated and covered with fertile soils. In the absence of shiny soils, it is best to use poor, non-toxic rocks with mineral fertilizers in biological rehabilitation.

6.2.5 Covering with fertile topsoil

Rehabilitation land sites need to be covered with topsoil once the shaping stage is complete. The physical and chemical properties of the topsoil will be predetermined and will require the use of soil fertilizers and mineral fertilizers if quality is not met. The covering topsoil shall have the following physical and chemical properties.

Table 6-6. Required ingredients for topsoil to be used for rehabilitation

№	Ingradients		Required contents
1	Humus / % /		2<
2	pH level	Acidity	> 5
		Neutral	6,5 – 7,8
		Alkaline	8 >
3	Mechanical contents /mud 10 – 75%/		Sand and mud contents

Metamorphic, effusive, rocky and sedimentary rocks that are not eroded with wind are suitable for use in reclamation and cannot be covered with rocks on restored surfaces. On

top of the rocks, the rocks will be covered with fertile soil after the layer is formed with a suitable rock to cover the base.

When fertile soil has high level of mechanical composition or dust, it affects vegetative growth. Sandy mud and sandy loam mechanics are ideal for rehabilitation. The covering topsoil is required to be dark brown or dark soil with a high concentration of organic matter content of 6.5 to 7.8 pH solution. If the soil solution is highly acidic or alkaline, take a neutralizing action to reduce it.

Density of covering topsoil shall be approximately 22-27 kg/cm2, and if the topsoil density is above 30 kg / cm2, it is necessary to make improvements. Covering with topsoil is suitable to be executed late spring after the strong windy period is over. The thickness of the pavement will depend on the soil reserve and vegetation that has been removed. Grassroots roots are 15-20 cm long, bushy plants are 30 to 40cm, and the trees are spread from 50 to 100 cm deep. Therefore, covering the soil with 25-30 cm thick soil and 15-20 cm thickness of topsoil. Another requirement for a fertile soils for pavement shall be free of chemical, radioactive and poisonous bacteria contaminations.

Table 6-7. Technical parameters for topsoil to be used for rehabilitation

Rock contents degree	Suitability
I	Most suitable
II	Suitable
III	Need to be improved
IV	Not suitable

6.2.6 Selection of plant seed for re-vegetation

Perennial pasture plants are usually considered as significantly effective plants that are suitable for the rehabilitation of damaged land sites. The roots of the perennial rhizomes are very important in the development of the environment and are well adapted to their environment. The legume plants enrich the soil with nitrogen and increase the productivity of the soil in the damaged area.

Biological rehabilitation plants should be planted with oysters, barley, and old-age plants with high energy intensity. Because the plants are capable of accumulating seeds and biomass, they are important for the protection of the basic and perennial plants of the reclamation, balancing soil moisture and heat regimes and shading from the sun. Effective rehabilitation activities should be in line with the 4-year regime of the year, in accordance with the conditions of the vegetation propagation period. This period varies with different geographical regions. The basis for biological reclamation is the diversity of natural, geographical, and ecosystems. Therefore, there are different technological choices in different dimensions.

Table 6-8.Recommended plant species for biological rehabilitation

Natural zone	Perennial species		Cover species (both annual and perennial)
	Lettuce	Leguminous plants	

Steppes and mountainous forest steppes	Yerhug Ulungu Stipa Botuuli Daagan suul	Tsargas Hoshoon Hoshoongor Hargana	Ovyos Budargana Luuli

The indigenious plants shown in above table are most suitable for biological rehabilitation in the UB-Darkhan road corridor.

Planting period: Planting period is determined according to the conditions of the selected plant species depending on the agrotechnical condition, in accordance with the natural and climatic conditions of the area. The duration of the planting season in the project area is as follows:

- Between 20-30 of May with irrigation
- In the first 10 days of May on the eve of rainfall in non-irrigation condition

Seed norm: It is estimated that an average of 20-25 grams of seeds per is 0.01 hectares of area. Depending on seed germination and seed purification, the norms for planting will be calculated to grow from 10,000 to 15,000 plants per 0.01 hectare area. Plain and leguminous blends should be taken in equal measure.

Planting method: It is best to use fertilizer to increase soil fertility in the rehabilitation area. Use of abundant manure, other organic matter (sawdust, food waste, biofloc) in different steppe and high altitude areas of different fertile soils shall be applied to not less than 30 tonnes per 1.0 hectares.

The seeds of the perennial plants require a lot of moisture, so the seeds should be pushed to a depth of 2-3 cm in the direction of the prevailing wind direction of the local area. Between 2-3 years between the technical and biological stages should be improved. In the first year, leguminous plants should be mixed with the same size. Nitrogen fertilizers can be made with 200 kg / ha inputs. Plant can be planted by manual or by techniques in seed rehabilitation areas. If the seed is planted manually, the seeds should be distributed as much as possible and should be fed after the removal. If the plant is technically planted, the depth of seeding will not exceed 3 cm, and the sowing line will be selected in the local dominant wind direction. After growing the plant, it is necessary to observe the growth and growth periodically and, if necessary, some agrotechnical procedures. To do this, irrigate the plants planted until they are able to grow independently.

In the biological reclamation, 60% of the survival rate 2 years after planting was done, can be considered that the rehabilitation is successful.

Table 6-9. Agro-technical requirements

Soil improvement	Methods
Preparing plant seeds	In case of irrigation is available, according to the standards
Fertilizing the soil	Fertilizers 10 – 20 ton/ha Bio-humus 10 – 20 kg/ha
Plantation period	2d half of May
Wind factor for seeding	Along the predominant wind direction
Selection of cover plant species	Use pre-planted seeds in case of irrigation, or use species that can bear drought in case of no irrigation. 0.8 – 1,5 million pcs of seeds per hectare.
Irrigation norm	200 – 400 tons
Irrigation frequency	At least 5 times per day

The seed norm is expressed in million units per hectare, based on 1000 seed weight by the method of transferring seed norms of agricultural crops.