

Darbaza–Maktaaral Railway Expansion Project

Non-Technical Summary

Supplementary Environmental and Social Impact Assessment

Draft, September 30, 2026



**ҚАЗАҚСТАН
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Report Control

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Acronyms and Abbreviations

Acronym	Meaning
ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
BAP	Biodiversity Action Plan
CAREC	Central Asia Regional Economic Cooperation
CESMP	Construction Environmental and Social Management Plan
CLO	Community Liaison Officer
EPC	Engineering, Procurement and Construction
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
GBVH	Gender-Based Violence and Harassment
GRM	Grievance Redress Mechanism
IBA	Important Bird and Biodiversity Area
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
KTZ	Kazakhstan Temir Zholy JSC
KZT	Kazakhstan Tenge
LARP	Land Acquisition and Resettlement Plan
NTS	Non-Technical Summary
OVOS	National Environmental Impact Assessment (Kazakhstan)
SEP	Stakeholder Engagement Plan
USD	United States Dollar

Purpose of the Document

This document is the Non-Technical Summary (NTS) of the Supplementary Environmental and Social Impact Assessment (ESIA) prepared for the Darbaza–Maktaaral Railway Expansion Project (the Project) in the Turkistan Region of the Republic of Kazakhstan. It has been prepared to give residents, land users, local officials and other interested parties a clear, plain-language explanation of the Project, the main environmental and social impacts that have been identified, and the measures that will be taken to avoid, reduce and manage those impacts.

The NTS is a public document. It has been prepared in accordance with the information disclosure and stakeholder engagement requirements of the Asian Development Bank (ADB), the International Finance Corporation (IFC) and the Asian Infrastructure Investment Bank (AIIB), which are considering financing for the Project, and with the requirements of the legislation of the Republic of Kazakhstan. The Project is classified as Category A by ADB and is being assessed as a high-risk project requiring comprehensive environmental and social assessment under the applicable requirements of ADB, AIIB and IFC.

Construction of the Project began in 2024, before the Supplementary ESIA was prepared. The assessment is therefore forward-looking: it concentrates on the remaining construction works, on the long-term operation of the railway and on the corrective actions needed where impacts have already occurred. The NTS will be made available in English, Kazakh and Russian.

1. Overview of the Project

1.1 Background

Kazakhstan Temir Zholy JSC (KTZ), the national railway company of Kazakhstan, is building a new railway line in the south of the country between Darbaza, near the town of Saryagash, and Maktaaral, close to the border with the Republic of Uzbekistan. The Project is being prepared for financing by ADB, IFC and AIIB (together, the Lenders), with Kazakhstan Temir Zholy JSC (KTZ) acting as the borrower. Construction is being carried out by the Engineering, Procurement and Construction (EPC) contractor, Integra Construction KZ LLP (Integra), supported by around ten subcontractors.

At present, most rail freight moving between Kazakhstan and the countries of Central Asia uses the existing Arys–Saryagash–Tashkent line, which crosses the border into Uzbekistan in the urban area between Saryagash and Tashkent. This corridor has carried around 22 million tonnes of freight per year and is operating at close to full capacity. Saryagash station and the Tashkent rail junction are the main bottlenecks, and both are surrounded by dense urban development, which makes expansion on the existing route very difficult.

The new line creates a direct route across Kazakh territory towards the border with Uzbekistan, bypassing the Saryagash and Tashkent rail junctions. It is identified by KTZ and the Government of Kazakhstan as a national strategic priority and forms part of the country's plans to develop its transport and transit potential, in line with the regional objectives of the Central Asia Regional Economic Cooperation (CAREC) programme.

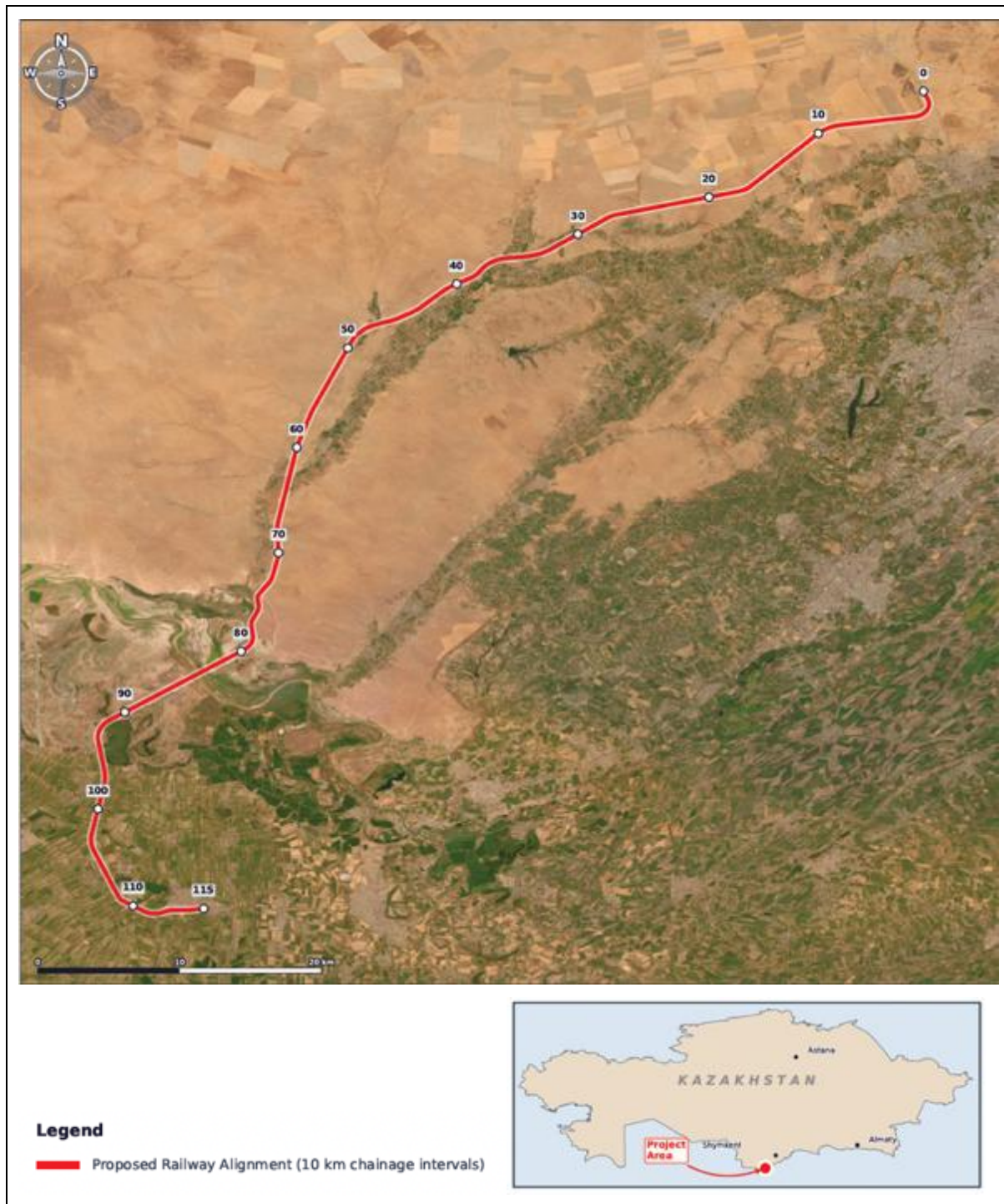
1.2 Project Description

The Project is a new (greenfield) single-track railway of approximately 115 km, with an additional 45 km of sidings and passing loops. It passes through five districts of Turkistan Region, which from north to south are Saryagash, Keles, Shardara, Zhetysay and Maktaaral.

The line begins at the new Yerdaut station (also known locally as Erdaulet or Erdaut), built on the site of a former passing loop near Darbaza, where it connects with the existing national rail network. It runs south through the steppe, pasture and farmland of Saryagash and Keles districts, crosses the Syr Darya River on a bridge of approximately 500 m, and then runs for approximately 16 km on a raised embankment across the eastern edge of the Shardara Reservoir. South of the reservoir, the line passes through the intensively irrigated cotton-growing land of Zhetysay and Maktaaral districts to the reconstructed Maktaaral station, from where trains continue to the state border.

The railway is not electrified and trains will be hauled by diesel locomotives. At full operation the line will carry approximately 46 trains per day (23 in each direction), 24 hours a day throughout the year. Most trains will carry freight such as coal, chemicals, fertilisers and containers; one passenger train will run in each direction each day.

Figure 1: Project Location



Source: KTZ / VISTA Environment AB

The main components of the Project are:

- The main railway line, including earthworks and embankments, track bed, sleepers and rails. Much of the line is built on embankment, requiring approximately 4.5 million m³ of imported fill material from permitted borrow pits.
- Three stations (Yerdaut, Intermediate and Maktaaral) and two passing loops, with associated depots, maintenance and servicing facilities. Yerdaut will be the main operational depot, where locomotives are serviced and refuelled.

- 33 major structures crossing the railway, comprising bridges (including the Syr Darya bridge and additional bridge openings within the Shardara Reservoir crossing), road and railway overpasses and one tunnel, together with approximately 130 culverts.
- Crossings for people, livestock and farm vehicles, including seven dedicated cattle underpasses, five agricultural underpasses, around 40 large box culverts that livestock can use, and nine agricultural level crossings.
- Two 10 kV overhead power lines running alongside the railway to supply signalling, communications and station services, including across the Shardara Reservoir.
- Temporary construction facilities, including approximately ten worker accommodation camps, concrete batching plants, fuel storage, material storage and laydown areas, access roads and borrow pits.

Construction is well advanced. By September 2026, more than 100 km of the route had been levelled and approximately 90 km of track laid, and works were under way at the stations, the sidings and the Syr Darya bridge. Approximately 800 workers and 350 items of heavy machinery are currently engaged on the Project. Construction is planned to be completed around the end of 2026 or early 2027, after which the railway will be operated by KTZ.

Table 1: Key Project Facts

Project Name	Darbaza–Maktaaral Railway Expansion Project
Location	Turkistan Region, southern Kazakhstan; Saryagash, Keles, Shardara, Zhetysay and Maktaaral districts
Railway Length	Approximately 115 km of new single-track railway, plus approximately 45 km of sidings and passing loops
Stations	Three stations (Yerdaut, Intermediate and Maktaaral) and two passing loops
Major Structures	33 major crossing structures, including the approximately 500 m Syr Darya bridge, road and railway overpasses and one tunnel; approximately 130 culverts
Traction	Diesel locomotives; the line is not electrified
Train Traffic	Approximately 46 trains per day (23 in each direction), mainly freight, operating 24 hours a day
Project Implementer	Kazakhstan Temir Zholy JSC (KTZ)
Borrower	Kazakhstan Temir Zholy JSC (KTZ)
EPC Contractor	Integra Construction KZ LLP
Prospective Lenders	Asian Development Bank (ADB), International Finance Corporation (IFC) and Asian Infrastructure Investment Bank (AIIB)
ESIA Category	Category A (ADB, IFC and AIIB) — highest category, requiring a full ESIA
Construction Period	Started in 2024; completion planned for the end of 2026 or early 2027
Construction Workforce	Approximately 800 workers at present, housed in approximately ten camps

1.3 ESIA Process

The Supplementary ESIA has been prepared by an independent consultant team led by VISTA Environment AB on behalf of KTZ. It builds on the national environmental impact assessment completed for the Project and adds the studies needed to meet the Lenders' standards. These include bird and wildlife surveys carried out between February 2025 and May 2026, an assessment of internationally important (Critical) habitat, noise and vibration modelling, a construction dust assessment, a climate risk assessment, socio-economic surveys of affected households and a programme of community consultations.

Because construction started before the Supplementary ESIA was prepared, a separate environmental and social compliance audit has reviewed the works carried out to date and identified corrective actions. Land acquisition and compensation are addressed in a dedicated Land Acquisition and Resettlement Plan (LARP) prepared at the same time as the ESIA.

1.3.1 Applicable standards and permitting

The Project must comply with the national legislation of Kazakhstan, including the Environmental Code (2021), the Land Code, the Water Code, the Labour Code and the law on the protection of historical and cultural heritage. The national environmental impact assessment for the Project (known as the OVOS) has been prepared in accordance with the Environmental Code. Specific permits are required for activities such as water abstraction, borrow pits, tree cutting and emissions; three borrow pit permits have been issued and one further permit is awaiting approval, and no material may be extracted from any borrow pit without a valid permit.

The Project must also meet the requirements of the Lenders: the ADB Safeguard Policy Statement (2009), the IFC Performance Standards (2012) and the AIIB Environmental and Social Framework (2024), together with the World Bank Group Environmental, Health and Safety Guidelines, including those for railways. These cover environmental assessment, labour and working conditions, pollution prevention, community health and safety, land acquisition, biodiversity and cultural heritage. Where national and Lender requirements differ, the Project applies the stricter requirement. Screening has confirmed that no Indigenous Peoples, as defined by the Lenders, are present in the Project area.

1.3.2 Stakeholder Engagement and Consultation

Public hearings on the national environmental assessment were held in 2023. At a hearing in Abay village (Keles District) in April 2023, residents objected to the proposed route through the Keles River valley close to their homes. In response, the route in Keles District was redesigned to bypass the valley between Abay and Kyzylasker villages, and the revised route was confirmed at public hearings held in Saryagash, Keles, Shardara/Zhetysay and Maktaaral districts in July 2023.

During design development, further site meetings were held with residents, local authorities and KTZ on livestock and farm access across the railway, including meetings in March 2026. These led to larger livestock passages being provided at several locations used by large herds.

Between 19 and 21 May 2026, the ESIA team held six community meetings in Erdauit, Akuy, Oshakty, Birlik (Keles District), Birlik (Zhetysay District) and Atakent, attended by 90 people. The meetings presented the preliminary ESIA findings, the land acquisition plan and the grievance mechanism, and participants received information brochures in Kazakh and Russian. The main issues raised were:

- dust, noise and child safety concerns linked to 24-hour construction work near homes;
- the size, number and practical usability of underpasses for livestock and farm vehicles;
- damage to irrigation channels and loss of harvests on land affected by construction;
- cracking reported in houses near the works, which residents link to vibration;
- whether the areas of land acquired match those stated in official decisions;

- the effect of the railway’s sanitary protection zone on a kindergarten in Erdaut;
- the use of diesel rather than electric locomotives and the effect of exhaust emissions; and
- fencing to prevent livestock straying onto the railway, and the handling of construction waste.

Engagement will continue throughout construction and operation, and the ESIA and associated documents will be publicly disclosed for comment in line with Lender requirements.

1.4 Why is the Project Needed?

The existing Saryagash–Tashkent crossing is the main rail link between Kazakhstan and Central Asia and is close to full capacity. Because the railway passes through built-up areas in both Saryagash and Tashkent, expanding the existing route would require large-scale acquisition of homes and businesses. Without a new route, freight traffic would continue to face delays and trains would continue to depend on transit through Uzbekistan.

The Project provides a shorter, direct route from southern Turkistan Region to Uzbekistan, Afghanistan and beyond, and releases capacity on the wider network for future growth. It is expected to create direct and indirect employment in southern Kazakhstan, to reduce transport costs for goods in the region and to improve local mobility through the new passenger service.

The Project also brings an environmental benefit by moving freight from road to rail. For the freight expected on this route, rail transport produces roughly nine times less carbon dioxide per tonne-kilometre than road transport, reducing the number of heavy lorries on the region’s roads.

2. Environmental and Social Baseline

2.1 Landscape and Geography

The railway crosses the south-eastern edge of the Turan Lowland, a wide plain that covers much of southern Kazakhstan. The terrain is flat to gently rolling throughout. Ground levels fall from approximately 409 m above sea level at Darbaza in the north to approximately 248 m at the Syr Darya crossing, and the route does not enter any mountainous areas.

The landscape changes from north to south. Saryagash and northern Keles districts have open steppe, pasture and intensively farmed land with polytunnels, orchards and vegetable plots. Southern Keles and Shardara districts are dominated by open, unfenced steppe used for grazing sheep, cattle and horses. The central section crosses the Syr Darya floodplain and the reedbeds and wetlands at the edge of the Shardara Reservoir. Zhetysay and Maktaaral districts in the south form part of the Mirzachoel (“Hungry Steppe”) plain, a flat landscape of cotton fields and irrigation canals.

Soils are mainly loess-type soils, which can lose strength when wet, and river-deposited soils that are locally salty, particularly in the south and around the reservoir. The landscape is not formally designated for its scenic value and already contains roads, power lines, irrigation canals, polytunnels and agricultural buildings.

Outside towns and villages, the area is quiet and rural. Noise measurements taken before construction showed low background noise levels at most locations, with higher levels only near existing roads and in Saryagash town. Air quality is influenced mainly by wind-blown dust, farming activity, local traffic and household heating.

2.2 Climate and Natural Hazards

The region has a dry continental climate with hot summers and cold winters. Summer temperatures regularly exceed 35 °C and can exceed 40 °C, while winter temperatures fall below freezing. Annual rainfall is low (approximately 230 to 295 mm), falling mostly between February and May, with almost no rain from July to September. Dust storms, heat waves and short, intense spring rainstorms are the main weather-related hazards.

Kazakhstan is warming faster than the global average, and further warming of more than 2 °C is projected over the long design life of the railway. A climate risk screening rated the overall climate risk to the Project as High. The main risks are river flooding at the Syr Darya crossing, rainfall-induced slope failure on embankments next to the Shardara Reservoir and rising temperatures, which can cause rails to buckle and create heat stress for workers. Drought, water shortage and wildfire are rated as moderate risks.

2.3 Water Resources

The Project lies within the Syr Darya basin, a large river system shared by Kyrgyzstan, Tajikistan, Uzbekistan and Kazakhstan. The river is fed mainly by snowmelt from the Tien Shan mountains, and the basin is recognised as being under chronic water stress, with most water used for irrigation.

The Shardara Reservoir, created by damming the Syr Darya in the 1960s, is approximately 80 km long and covers up to around 900 km². It provides water for irrigation, hydropower and water supply and is managed by the regional water authority. Water levels in the reservoir vary by up to 11 m during the year, exposing mudflats and floodplain in summer.

Across the southern districts, farming depends on a dense network of irrigation canals, ditches and drains. The railway crosses this network at many points, and design records identify 79 structures that carry irrigation and drainage water beneath the line. Groundwater is shallow and often salty in the southern districts.

2.4 Ecology and Biodiversity

Around 80% of the route passes through land that has been heavily modified by farming, grazing and settlement and has limited value for wildlife. Biodiversity value is concentrated where the railway crosses the eastern end of the Shardara Reservoir and the Syr Darya floodplain.

The Shardara Reservoir is internationally recognised as an Important Bird and Biodiversity Area (IBA) and a Key Biodiversity Area (KBA), although it has no formal protection under national law. It lies on a major bird migration route and is one of the most important wintering sites for waterbirds in Central Asia, with counts of up to 150,000 birds in some winters. Its wetland habitats include open water, extensive reedbeds, riverside tugai woodland of Euphrates poplar and tamarisk, and seasonally flooded grassland.

The Critical Habitat Assessment carried out for the Project concluded that the reservoir area qualifies as Critical Habitat, the highest level of biodiversity importance under the Lenders' standards, because of three species:

- **Dalmatian pelican** (*Pelecanus crispus*) — the reservoir is a globally important wintering site, having held up to around 4% of the world population of this species at its historical peak.
- **Pygmy cormorant** (*Microcarbo pygmaeus*) — a large mixed breeding colony of waterbirds, including approximately 1,500 pairs of pygmy cormorant, 1,000 pairs of glossy ibis and several hundred pairs of little egret, was discovered in June 2025 in reedbeds near Azattyk village, approximately 1.2 km from the railway.
- **Syr Darya shovelnose sturgeon** (*Pseudoscaphirhynchus fedtschenkoi*) — a Critically Endangered fish found only in the Syr Darya system. It has not been confirmed for decades, but reliable local sightings mean it must be treated as potentially present.

Other important species include the Lesser White-fronted Goose, the Aral barbel (a threatened fish), steppe eagle and white-tailed eagle. The steppe and semi-desert sections support goitered gazelle, marbled polecat and the Central Asian tortoise, all listed as Vulnerable by the International Union for Conservation of Nature (IUCN), and nationally protected plants such as *Salvia korolkowii* and *Eminium lehmannii*.

There are no nationally protected areas in the immediate Project area. The nearest formally protected area, the Ugam-Chatkal National Park in Uzbekistan, is approximately 45 km away, and the Aydar-Arnasay Lakes wetland in Uzbekistan is not expected to be affected.

2.5 Communities and Livelihood

Turkistan Region is one of the most populous regions of Kazakhstan, with approximately 2.1 million people, three quarters of whom live in rural areas. The five Project districts have a combined population of approximately 770,000, and the rural districts and settlements closest to the railway are home to approximately 194,000 people. Atakent is the only predominantly urban settlement close to the route.

Livelihoods depend mainly on agriculture. In the north, livestock grazing (mainly sheep) and mixed farming with polytunnels, orchards and vegetables are important. In the south, irrigated cotton is the main crop, alongside wheat, alfalfa, melons and other crops. Among households directly affected by land acquisition, around 72% earn income from farming or livestock, and many also rely on pensions and social allowances.

The population is mainly Kazakh, with large Uzbek communities and, particularly in Zhetysay and Maktaaral districts, Tajik, Azeri and other groups. Turkistan Region has the highest proportion of people living below the national subsistence minimum in Kazakhstan, and rural poverty is around 10%.

Many working-age men migrate for work elsewhere, which increases the role of women, older people and remaining household members in farming.

Vulnerable groups in the Project area include low-income households, older people without family support, people with disabilities, large families and households headed by women. Women generally have fewer opportunities to take part in public meetings and decision-making, which the Project's engagement arrangements are designed to address.

3. Alternatives Considered

The ESIA examined the alternatives considered during the planning of the Project to check whether environmental and social impacts were taken into account and whether the selected option is the best way of meeting the Project's objectives.

3.1 The “Without Project” alternative

Without the Project, no new line would be built and freight would continue to depend on the congested Saryagash–Tashkent route and on transit through Uzbekistan. This would avoid the impacts of construction and operation, particularly on the Shardara Reservoir and on agricultural land, but would lose the transport, economic and regional connectivity benefits of the Project and the environmental benefit of moving freight from road to rail. This alternative was therefore not taken forward.

3.2 Route Alternatives

In the southern section, the route follows an existing railway formation between Maktaaral and Zhetysay, and the position of the Syr Darya crossing was fixed by the existing road bridge, so there was no practical alternative. Route options were therefore considered for the northern section:

- **Variant A**, connecting to the existing network at Zhilga station, would have been about 31 km longer and about one third more expensive. It would have passed further from settlements and crossed less irrigated farmland, but its greater length would have created land-take and biodiversity impacts along a longer corridor and higher diesel emissions over the life of the railway.
- **Variant B**, connecting at a former passing loop near Darbaza (now Yerdaut station), was selected. It passes closer to villages and crosses more irrigated land, and these impacts are addressed through land acquisition and compensation, crossing structures and noise and vibration controls.
- **Variant C**, running via Shardara town, was rejected because it was longer, would have crossed the Shardara Reservoir over a much greater distance and closer to its centre, and would have had greater impacts on birds and wetland habitats.

Within the selected route, the alignment in Keles District was changed in 2023 following objections from local residents, moving the railway away from the Keles River valley and the villages of Abay and Kyzylasker.

3.3 Traction and Power Supply Alternatives

Electric trains would have produced no exhaust emissions along the route. However, the regional electricity company confirmed in 2023 that the regional grid did not have the capacity to supply an electrified railway, and southern Turkistan Region is short of power. Diesel traction was therefore selected, and the design for future electrification has been retained so that the line can be electrified when sufficient power becomes available.

Three options were considered for the 10 kV power lines where they cross the Shardara Reservoir: two overhead lines, two buried cables, or a single buried cable. Burying the cables would remove the risk of birds colliding with the lines, and the ESIA team identified a single buried cable as the preferred option. KTZ has indicated that the overhead option will be used for cost reasons. As a result, the Project is committed to fitting the lines with bird flight diverters and bird-safe pole designs, to monitoring bird deaths and to compensating for any residual losses through its biodiversity programme.

3.4 Design Choices to Reduce Impacts

Within the selected route, a number of design choices have been made to reduce environmental and social impacts:

- The railway formation has been narrowed across the Shardara Reservoir, limiting the permanent footprint within the IBA/KBA to approximately 150 ha.
- Four additional bridge structures have been included within the reservoir crossing, in addition to the main Syr Darya bridge, to keep water flowing freely across the floodplain.
- Livestock passages measuring 4.0×2.5 m have been included in the design at KM 22.9, KM 42.8 and KM 55.1, where residents identified established routes used by large herds.
- Dedicated agricultural and cattle underpasses, large box culverts and agricultural level crossings maintain access between villages, fields and pasture.
- The capacity of bridges, culverts and drainage is being checked against projected future flood flows, and rail installation temperatures are being adjusted for future higher temperatures.
- All public road level crossings will be fully automated, with barriers and audible and visual warnings.
- Noise barriers will be installed at Maktaaral and Yerdaut stations, where the railway is closest to homes.

4. Potential Impacts and Mitigation Measures

Most construction impacts, such as dust, noise, soil disturbance and temporary disruption to access and irrigation, are temporary, local and reversible. The table below summarises the key impacts and their significance after mitigation measures have been applied. Detailed measures are set out in the Environmental and Social Management Plan (ESMP).

Table 2: Summary of Key Impacts, Mitigation and Residual Significance

Impact Topic	Phase	Residual Significance	Key Mitigation Measures
Permanent loss of habitat in the Shardara IBA/KBA (approx. 150 ha)	Construction / Operation	High	Footprint narrowed; four additional bridge openings; restoration of all temporary works areas; Biodiversity Action Plan with offsets to achieve no net loss and a net gain for Critical Habitat species.
Construction disturbance and temporary disruption of water flow in the IBA/KBA	Construction	Medium	Seasonal and lighting controls; bridge openings opened as early as possible; pre-clearance surveys; spill and sediment controls; restoration monitored for at least two growing seasons.
Threatened fish, including Syr Darya shovelnose sturgeon, during in-river works	Construction	High (conditional)	No in-river works during the fish spawning period; fish monitoring; timing and methods of in-river works agreed with the relevant authorities and reviewed if sturgeon are confirmed; sediment and spill controls; conservation actions under the Biodiversity Action Plan.
Bird collision and electrocution on the 10 kV power lines	Operation	Low; potentially High for Dalmatian pelican until confirmed by monitoring	Bird flight diverters within the IBA/KBA and 1 km beyond; bird-safe pole design; bird fatality monitoring; additional measures within 90 days if threatened species are affected.
Severance of farmland and livestock routes	Operation	Low	Underpasses, box culverts and level crossings; site verification of all crossings with land users before operation; corrective measures where access is inadequate.
Damage to or interruption of irrigation and drainage	Construction / Operation	Low	14 days' notice of canal interruptions; no interruption over 72 hours without alternative supply; repair of damaged channels; regular inspection and maintenance of crossings.
Land acquisition and loss of livelihoods	Pre-construction / Construction	Medium (land); Low (livelihoods)	Compensation at full replacement cost; relocation and transition allowances; extra support for severely affected and vulnerable households; livelihood restoration programme.

Impact Topic	Phase	Residual Significance	Key Mitigation Measures
Railway noise near homes	Operation	Medium	Noise barriers at Maktaaral and Yerdaut; detailed modelling at four further locations; limits on horn use and locomotive idling.
Vibration and risk of building damage	Construction / Operation	Low (construction); Medium (operation, pending detailed assessment)	Building condition surveys; real-time vibration monitoring with action levels; detailed operational assessment and track-based mitigation at Maktaaral and Ushagash.
Dust and air emissions	Construction / Operation	Low	Full dust control measures; water spraying; maintenance of plant and locomotives; air quality monitoring at Akuy village.
Community safety (traffic, trespass, level crossings)	Construction / Operation	Low; Medium for crossing and fencing design	Fencing and signage in Kazakh and Russian; traffic management; automated level crossings; safety awareness in schools and villages.
Accident involving hazardous cargo	Operation	Medium	Emergency response plan for the Shardara crossing; pre-positioned spill equipment; no unstabilised hazardous bulk liquids across the reservoir; spill-holding systems in track drainage.
Archaeological sites and chance finds	Design / Construction	Medium (direct effects on known sites, pending site-by-site verification); Low (effects on setting)	Protection zones treated as no-go areas; site-by-site verification; archaeological investigation where required; chance finds procedure.
Worker health, safety and labour conditions	Construction	Low	Permits for high-risk work; supervision with stop-work authority; heat action plan; worker grievance mechanism; accommodation standards; Code of Conduct.
Climate change risks to the railway	Operation	Moderate	Flood capacity checks for bridges and culverts; temperature-adjusted rail design; speed restrictions in extreme heat; embankment inspections.
Greenhouse gas emissions	Construction / Operation	Medium	Efficient locomotive operation and maintenance; annual emissions reporting; review of reduction options; future electrification retained.
Landscape and views	Operation	Medium	Planting with native species at stations, sidings and bridges; control of external lighting; minimised embankment heights.

Note: 'High' indicates a residual impact that remains significant even after mitigation and requires additional measures such as biodiversity offsets; 'Medium' indicates a manageable residual impact with targeted controls in place; 'Low' indicates that the impact is adequately controlled by the proposed measures. 'Conditional' means the rating depends on further surveys or on implementation of the Biodiversity Action Plan.

4.1 Biodiversity: Shardara Reservoir IBA/KBA and Protected Species

The crossing of the Shardara Reservoir IBA/KBA is the most sensitive part of the Project. The permanent railway embankment occupies approximately 150 ha of habitat within the IBA/KBA, mainly river channels and floodplain grassland (about 130 ha) and tugai scrub, reedbed and mudflat (about 20 ha). Although this is only about 0.15% of the whole IBA/KBA, it is habitat used by Dalmatian pelican, wintering and migrating waterbirds and breeding birds, and the loss is permanent. This is the only impact of the Project that is assessed as remaining High after mitigation in all circumstances. The effects of in-river works on threatened fish, and the risk of Dalmatian pelicans colliding with the power lines, may also remain High until further surveys, monitoring and implementation of the Biodiversity Action Plan confirm otherwise.

During construction, noise, lighting, machinery and people can disturb birds up to several hundred metres from the works, and building the embankment can temporarily restrict water movement across the floodplain. In-river works at the Syr Darya bridge could disturb threatened fish or affect water quality through sediment or spills. During operation, the main risk to birds is collision with or electrocution on the two 10 kV overhead power lines.

The key measures to address these impacts are:

- Keeping the permanent footprint to the minimum and including four additional bridge openings so that water can flow across the reservoir margin.
- Pre-clearance ecological surveys before any further vegetation clearance, with translocation of protected species such as tortoises where needed, and avoidance of clearance during the bird breeding season (April to August) unless surveys confirm there are no active nests.
- Directional, low-intensity lighting at work sites and no lighting outside active work areas within the IBA/KBA.
- Restoring all temporary work areas in the IBA/KBA to their original habitat type, with monitoring for at least two growing seasons.
- No in-river works during the spring spawning period of the Syr Darya shovelnose sturgeon and Aral barbel, with the exact period confirmed with the national fisheries authorities; fish monitoring during in-river works, with the timing and methods of the remaining works agreed with the relevant authorities and reviewed if the Syr Darya shovelnose sturgeon is confirmed nearby.
- Fitting bird flight diverters on the power lines through the IBA/KBA and for 1 km beyond, and using bird-safe pole designs that prevent electrocution.
- Limiting train speeds to 50 km/h and prohibiting horn use within the IBA/KBA during the breeding season (April to August).
- Monitoring bird deaths along the line for at least three years within the IBA/KBA, repeated every five years, with additional measures within 90 days if globally threatened species are affected.
- A Biodiversity Action Plan, including the development and implementation of appropriate biodiversity offsets with national conservation organisations, with the objective of achieving no net loss of biodiversity within the IBA/KBA and the required net gain for Critical Habitat values, including the pelican, pygmy cormorant and sturgeon.

4.2 Water Resources, Irrigation and Drainage

The railway crosses the Syr Darya, the edge of the Shardara Reservoir and many irrigation canals and drains. Construction can affect water quality through sediment and fuel or chemical spills, and embankments can obstruct surface water flow, cause local flooding or interrupt irrigation supplies. Construction also uses water in a region that is already water-stressed.

Some irrigation infrastructure has already been affected. A damaged water pipe at KM 25.9 has been repaired and access for maintenance restored. Restoration of a concrete irrigation channel (known locally as a LOTOK) at Ushagash is under way, and a similar channel at Atakent is being relocated. During the land survey, users of 141 farm plots raised concerns about possible irrigation disruption. The key measures are:

- scheduling canal interruptions outside the main irrigation season (May to September) wherever possible;
- giving at least 14 days' written notice of any interruption to an active canal, and providing temporary bypasses so that no interruption lasts longer than 72 hours without an alternative supply;
- repairing irrigation infrastructure damaged during construction, and checking that all irrigation and drainage crossings work properly before the railway is handed over;
- inspecting irrigation and drainage crossings every three months during the first three years of operation and after major floods;
- checking the capacity of bridges and culverts against projected future flood flows;
- preventing pollution through spill kits, bunded fuel storage and sediment controls; and
- managing construction water use carefully, using permitted sources and coordinating with the basin water authority, particularly during the irrigation season.

4.3 Agriculture, Livestock Access and Severance

The railway forms a new permanent barrier across farmland and pasture. Without adequate crossings, it could separate villages from their fields, grazing land and water, and lengthen journeys for farmers and herders. This is a particular concern in the northern districts, where large numbers of livestock move daily between villages and pasture.

The Project provides extensive crossing points, including dedicated cattle and agricultural underpasses, large box culverts and agricultural level crossings. Following requests from residents, 4.0 × 2.5 m livestock passages have been included in the design at KM 22.9, KM 42.8 and KM 55.1. At KM 55.1, technical constraints may limit the clear height to about 2 m, and the final dimensions will be checked on site before operation. A request for an additional crossing at KM 44.8 was not accepted on design grounds, and the crossing at KM 42.8, approximately 2 km away, has been identified as the alternative. Residents in Oshakty raised concerns that some underpasses are too small, too long or too dark for livestock to use.

Before the railway starts operating, KTZ and Integra will check the completed crossing arrangements on site against actual agricultural and livestock access requirements, informed by consultation with affected farmers, herders and local Akimats. Where a crossing is found to be inadequate, practical corrective measures will be put in place before operations begin. These may include improving access to an existing crossing, adapting a structure or, where necessary and technically feasible, providing an additional crossing. Stock-proof fencing and signage will reduce the risk of livestock straying onto the line.

4.4 Noise and Vibration

For most of the route, the railway passes through open steppe and farmland with no nearby homes. Noise modelling predicts that railway noise will exceed international guideline values for daytime and night-time noise at six locations where the line passes close to villages or stations: Maktaaral, Yerdaut, Kurish, Ushagash, Saryzhylga–Bereke and Shyryldak–Zhabaitobe. The largest numbers of affected homes are near Maktaaral and Yerdaut stations, where noise from horns, idling locomotives and station activity is greatest.

Noise barriers are committed at Maktaaral and Yerdaut stations. At the other four locations, more detailed noise modelling will confirm the measures needed. Rules will limit horn use and locomotive idling near homes. Affected communities will be consulted on the results and the proposed measures.

Vibration from passing trains may exceed guideline levels at 18 buildings (homes and businesses) in Maktaaral and Ushagash. A detailed vibration assessment will be carried out at these locations, and measures such as vibration-reducing track will be installed where needed. During construction, 142 buildings lie within 100 m of the works, including 35 within 30 m. Building condition surveys will be carried out before further heavy works near homes, and vibration will be monitored continuously, with works adjusted if agreed action levels are approached. Reports of cracking in houses at Ushagash will be investigated.

4.5 Air Quality, Climate Change and Greenhouse Gases

Construction dust from earthworks, haul roads and material stockpiles can affect nearby homes and crops, including polytunnels. The construction dust risk was assessed as high, and the full set of recommended dust control measures will be applied, including water spraying, covering loads and stockpiles, speed limits on unpaved roads and regular maintenance of machinery. With these measures, residual effects are assessed as low. During operation, diesel locomotives will emit exhaust gases. Air quality will be monitored annually at sensitive locations, including Akuy village, where residents raised concerns, and corrective action will be taken if standards are exceeded.

The Project is estimated to produce approximately 58,000 tonnes of carbon dioxide equivalent each year during operation, mainly from diesel locomotives. This is above the level at which the Lenders require emissions to be reported annually and options for reducing them to be reviewed. At the same time, moving this freight by rail instead of road avoids a much larger quantity of emissions from lorries.

To protect the railway against climate change, the design of bridges, culverts and drainage is being checked against future flood flows, rails are being installed to withstand higher temperatures, and embankments will be inspected regularly. Temporary speed restrictions will be applied during extreme heat. With these measures, the climate risk to the Project is expected to fall from High to Moderate.

4.6 Communities: Access, Health and Safety

The main risks to communities during construction are road accidents involving construction vehicles, people (particularly children) entering work sites, disruption of local roads and tracks, and nuisance from 24-hour working. Once the railway is operating, the main risks are trespass onto the line, accidents at level crossings and livestock straying onto the track. Key measures include:

- fencing of active work sites and storage areas, with controlled access and warning signs in Kazakh and Russian;
- a traffic management plan for construction vehicles, including agreed routes, speed limits and safe crossing points near schools and villages;
- at least 48 hours' notice in Kazakh and Russian before high-impact construction activities, and identification of safe alternative routes where access is temporarily restricted;

- community liaison cover during night-time working and stronger supervision of subcontractors;
- full automation of all public road level crossings, with barriers and warning systems, and fencing and signage to discourage trespass;
- emergency response arrangements for construction and operation, including a specific plan for the Shardara Reservoir crossing, with spill equipment kept ready and no unstabilised hazardous bulk liquids carried across the reservoir; and
- a grievance mechanism through which residents can raise concerns at any time.

4.7 Gender and Vulnerable Groups

The Project recognises that women, older people, people with disabilities and low-income households may be affected differently and may find it harder to take part in consultation or to raise concerns. A largely male workforce, partly from outside the area, also brings a risk of gender-based violence and harassment (GBVH). Specific measures include:

- women-only and small-group meetings, held at times that fit around farm work and seasonal migration;
- information provided in Kazakh, Russian and Uzbek, in plain language and in pictures where needed;
- a mandatory Code of Conduct for all workers, with zero tolerance of GBVH and disciplinary action including dismissal;
- a confidential, survivor-centred reporting channel for GBVH, with trained female focal points at work sites, the Project office and the KTZ regional office in Turkistan;
- additional assistance for vulnerable households affected by land acquisition; and
- monitoring of the use of the grievance mechanism by women and vulnerable groups, so that barriers can be identified and addressed.

4.8 Cultural Heritage

Southern Kazakhstan has a long history of settlement, and archaeological surveys along the route have identified ancient settlement sites and burial grounds. A 2022 survey recorded nine sites, including four ancient settlements and five burial sites. A later survey of the final route recorded 33 individual burial mounds in eight groups near Birlik, some of which lie within a few metres of the railway.

Protection zones have been set for the known sites, and plans have been prepared for their protection. For the remaining works, known sites and their protection zones will be treated as no-go areas unless the required investigation and approvals are in place. Each known site will be checked against the completed works to confirm whether it has been avoided or affected, and any measures required by the national heritage authorities will be carried out.

A chance finds procedure applies to all earthworks. If any object of possible archaeological importance is found, work in that area must stop immediately, the find must be protected and the heritage authorities must be informed before work can resume. Mosques, cemeteries and other places of community importance will be protected from disturbance and access to them maintained. No intangible cultural heritage has been identified that would be lost as a result of the Project.

4.9 Labour and Working Conditions

The construction workforce of approximately 800 people is employed by Integra and around ten subcontractors across four construction lots. Skilled roles such as rail laying, welding and bridge work are mainly filled by specialists from outside the area, while semi-skilled and unskilled roles offer the

main opportunities for local people. The Project must comply with the labour laws of Kazakhstan, the core conventions of the International Labour Organization and the Lenders' labour standards. The Contractor and all subcontractors must, as a minimum:

- provide written employment contracts in a language workers understand, with fair wages, working hours and conditions;
- prevent child labour and forced labour, including in the supply chain, and ensure non-discrimination and equal opportunity;
- respect workers' right to join workers' organisations;
- maximise the employment of local people where the required skills are available, and report the share of local hire;
- house workers in camps that meet international standards for accommodation, sanitation, water, catering and welfare;
- require all workers to sign the Project Code of Conduct; and
- provide a workers' grievance mechanism, including anonymous complaints and protection against retaliation, with acknowledgement within 3 working days and a response within 10 working days.

4.10 Health and Safety

Railway construction includes high-risk activities. All workers, including subcontractor staff, must receive health and safety training before starting work, and the Contractor must implement an occupational health and safety management plan throughout construction. Specific risks include:

- working at height and lifting operations, particularly at bridges and stations;
- deep excavations and bridge construction over and in the Syr Darya;
- working close to operating trains on sections already in use;
- extreme summer heat, which is treated as a high risk and managed through a Heat Action Plan with adjusted working hours, rest breaks, shade and drinking water; and
- the remote location of many work sites, requiring first aid and emergency equipment at every active work front.

Controls include work permits for high-risk activities, site supervisors with authority to stop unsafe work, weekly safety talks, enforcement of personal protective equipment and the recording and investigation of all incidents. During operation, KTZ will apply the same principles to maintenance workers, including those working on the track, the power lines and at the Yerdaut depot.

4.11 Landscape and Visual Amenity

The embankments, bridges, stations and moving trains will be visible over long distances across the flat, open landscape, particularly in the steppe sections and near villages. This change cannot be fully avoided. To reduce it, stations, sidings and bridge approaches will be planted with native species, external lighting will be limited to what is needed for safety and designed to avoid light spill, and embankment heights have been kept to the minimum required for flood protection.

4.12 Cumulative Impacts

The ESIA also considered the combined effects of the Project with other existing and planned developments, including the existing rail and road network, the Shardara dam and irrigation systems and possible later stages of the railway. With the Project's measures in place, the combined effect on the Syr Darya water regime is Low. Combined effects on waterbirds at the Shardara Reservoir, on air

quality during construction, on community safety and on agricultural livelihoods are Medium. KTZ will coordinate with government bodies and the Akimats on construction traffic, workforce and biodiversity monitoring, and will include these topics in its regular reporting to the Lenders.

4.13 Project Benefits

The Project's main purpose is to improve rail connectivity in southern Kazakhstan and across Central Asia. Its benefits extend from the construction period through the long-term operation of the railway.

Transport and connectivity. The new line relieves the congested Saryagash–Tashkent corridor, provides a shorter and more direct route to Uzbekistan and beyond, and allows KTZ trains to reach the border without transiting a neighbouring country. The daily passenger service will also improve travel options for communities along the route.

Local economy and employment. Construction provides jobs for local people, particularly in semi-skilled and unskilled roles, and creates demand for local goods and services. In the longer term, lower transport costs and better access to markets are expected to support economic development in Turkistan Region, one of the poorest regions of Kazakhstan.

Environmental benefits. Moving freight from road to rail reduces the number of heavy lorries on the region's roads and the associated emissions, noise and road accidents. For this route, rail freight produces roughly nine times less carbon dioxide per tonne-kilometre than road transport. The design also allows for future electrification of the line.

Biodiversity knowledge and conservation. The surveys carried out for the Project have added significantly to what is known about the Shardara Reservoir, including the discovery of a previously unrecorded breeding colony of pygmy cormorants and other waterbirds. The Biodiversity Action Plan will include measures intended to achieve no net loss within the IBA/KBA and net gain for the Critical Habitat-triggering species.

5. Environmental and Social Impacts Management

The Project's environmental and social management framework consists of a set of linked management documents prepared to meet the requirements of the Lenders. These set out the measures, responsibilities, monitoring requirements and reporting arrangements for managing all identified risks and impacts.

KTZ has overall responsibility for implementing these measures, for monitoring and reporting and for operating the grievance mechanism. Integra is responsible for delivering the construction-phase commitments, supported by specialist staff, including a health and safety specialist, a labour officer, community liaison staff, an ecologist and a cultural heritage monitor. Subcontractors must meet the same standards. KTZ will also appoint an independent environmental and social consultant to monitor implementation.

Table 3: Key Management Documents

Environmental and Social Management Plan (ESMP)	The main management document covering all environmental and social risks, organised into design and pre-construction, construction and operation and maintenance.
Construction Environmental and Social Management Plan (CESMP)	The Contractor's site-specific version of the ESMP, with topic plans covering pollution, dust, noise, vibration, soils, traffic, workforce, camps, biodiversity, chance finds, irrigation and heat stress.
Biodiversity Action Plan (BAP)	Sets out how the Project will achieve no net loss of biodiversity in the Shardara Reservoir IBA/KBA and a net gain for Critical Habitat species, including offsets and monitoring.
Land Acquisition and Resettlement Plan (LARP)	Compensation, relocation and livelihood restoration for all people affected by land acquisition, with its own grievance process.
Stakeholder Engagement Plan (SEP)	How the Project will communicate with and involve communities and other stakeholders during construction and operation.
Labour Management Procedures	Management of workers' rights, working conditions, accommodation and workforce-related risks, including the workers' grievance mechanism.
Corrective Action Plan	Time-bound actions to correct the shortcomings identified by the compliance audit of the construction works carried out before the ESIA.

5.1 Stakeholder Engagement Plan

5.1.1 Engagement with Communities

KTZ is responsible for stakeholder engagement, supported during construction by Integra. Community Liaison Officers are the main day-to-day contact for residents. Planned engagement activities include:

- meetings with affected communities before high-impact works, with advance notice in Kazakh and Russian of any road closure or access restriction;
- consultation at the six locations where railway noise is predicted to exceed guideline values, once detailed noise and vibration assessments are complete;
- site visits with farmers, herders and local Akimats to check every livestock and farm crossing before the railway starts operating;

- follow-up with land users on the repair of irrigation channels, field access roads and other farm infrastructure;
- women-only and small-group meetings, and targeted outreach to vulnerable households;
- consultation with conservation organisations, fishing and herding communities and government bodies on the Biodiversity Action Plan; and
- public disclosure of project documents at KTZ offices, the Integra site office, district Akimats and online, in Kazakh, Russian and English.

5.1.2 Grievance Redress Mechanism (GRM)

The Project has established a Grievance Redress Mechanism (GRM) to receive and resolve concerns, complaints and questions from anyone affected by the Project. The GRM covers issues such as dust, noise and vibration, construction traffic, community safety, access to fields and pasture, irrigation and damage to property. It is free of charge, available throughout construction and operation, and complaints can be made anonymously. Grievances can be submitted in Kazakh, Russian or Uzbek through any of the following channels:

- **In person** — to the Community Liaison Officer, at KTZ or Integra offices, or at the district Akimat;
- **In writing** — through grievance boxes at Yerdaut, Intermediate and Maktaaral stations and at village and district Akimat offices;
- **By telephone or email** — to the Community Liaison Officer, Laura Isaeva, on +7 778 616 0179 or at laura0479@mail.ru;
- **Directly to KTZ** - Branch of NC KTZ JSC - Mainline Network Directorate;
- **Through the district Akimats** — Land Relations Departments of Saryagash District (+7 702 369 8385), Keles District (+7 705 772 7664), Zhetysay District (+7 771 695 3354) and Maktaaral District (+7 708 007 9707); and
- **Through trusted intermediaries** — such as village elders or female focal points, for people who prefer not to raise an issue themselves.

All grievances are recorded and tracked until they are resolved. Receipt is acknowledged within one week, and the Community Liaison Officer will aim to resolve the grievance within two weeks. If it cannot be resolved at this level, it is referred to a Grievance Redress Committee at the district Akimat (Level 1), which has a further two weeks, and then to a regional Grievance Redress Committee in Turkistan Region (Level 2), which has one month. In total, a grievance should be resolved within about eight weeks. Responses to anonymous grievances are displayed on the information board of the office where the grievance was submitted.

Complaints about gender-based violence or harassment are handled separately through a confidential, survivor-centred process with trained female focal points. Complaints about land acquisition and compensation are handled through the grievance process of the Land Acquisition and Resettlement Plan. The GRM does not replace other legal remedies: complainants may use the national E-Otinish complaints system or the courts at any time, and may also contact the independent accountability mechanisms of the Lenders: the ADB Accountability Mechanism, the IFC Compliance Advisor Ombudsman (CAO) and the AIIB Project-affected People's Mechanism. Retaliation against anyone who raises a grievance is prohibited. KTZ will publish a summary of grievances received and resolved every three months.

5.2 Land Acquisition and Resettlement

Land acquisition for the Project is carried out by the Turkistan Region and district Akimats in accordance with national law, with KTZ coordinating and financing the process. A Land Acquisition and Resettlement Plan (LARP) has been prepared to meet the Lenders' requirements. Because construction started before this plan was prepared, it covers both land that has already been acquired and land still to be acquired.

The Project permanently affects 371 land plots (48 privately owned and 323 leased) covering approximately 417 ha, most of it leased agricultural land. These plots are used by 308 households and 23 legal entities, with an estimated 1,744 affected people. A total of 138 affected parties are classified as severely affected and 93 households as vulnerable. The Project also affects 101 buildings and structures on 25 plots, and 14 households and one business need to relocate. For plots where acquisition had not started by the time of the survey, the cut-off date for eligibility is 16 February 2026.

As of 25 August 2026, compensation had been paid for all affected plots in Zhetysay and Keles districts and for 35 plots in Maktaaral District; one payment in Saryagash District, relating to a residential plot in Yerdaut, remained subject to a court case. A further 41 plots were given voluntarily, supported by signed donation letters. The key commitments are:

- compensation at full replacement cost for land, buildings, trees and crops, with relocation and transition allowances;
- additional assistance for severely affected and vulnerable households, and a livelihood restoration programme;
- a re-survey of 31 irrigated plots in Birlik (Zhetysay District), as requested by the affected people, with the results provided in writing;
- verification of all affected people, assets and entitlements, and closure of any gaps for land already acquired; and
- internal and external monitoring of the plan's implementation, with an estimated budget of approximately KZT 1.54 billion (about USD 3.2 million), including contingency, financed by the Government of Kazakhstan through the Akimats and KTZ.

5.3 Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) sets out all environmental and social mitigation measures, monitoring requirements, responsibilities and reporting arrangements for the design, construction and operation phases. Because construction was already under way, the design-stage part of the ESMP is mainly a verification exercise, checking that the completed design includes the commitments made in the ESIA, such as the narrowed embankment and additional bridges in the reservoir, the livestock passages and the culvert capacity.

The ESMP will be included in the construction contract with Integra as a binding obligation. Integra will implement it through its CESMP, which will include site-specific details such as camp locations, traffic arrangements and the timing of ecological surveys. KTZ will supervise implementation, and failure to comply may be treated as a breach of contract. During operation, KTZ will implement the operational commitments, including the noise barriers, the bird protection measures and monitoring, the emergency response plan for the Shardara crossing and waste management at the Yerdaut depot and Maktaaral station.

5.4 Corrective Actions for Works Already Undertaken

Because construction started before the ESIA was prepared, an independent environmental and social compliance audit, completed in February 2026, reviewed how the works carried out to date had been managed. It identified shortcomings in areas such as health and safety, community notification,

subcontractor labour conditions, emergency preparedness and awareness of the grievance mechanism. The resulting corrective actions have been built into the construction-phase ESMP, and KTZ must provide documented evidence that each action has been completed.

Priority actions for the remainder of construction include completing the restoration of the Ushagash irrigation channel and the relocation of the Atakent channel, verifying the livestock and farm crossings, carrying out building condition surveys near the works, strengthening site supervision and community liaison, and finalising and implementing the Biodiversity Action Plan.

5.5 Monitoring and Reporting

KTZ will submit semi-annual environmental and social monitoring reports to ADB, IFC and AIIB throughout construction and operation. These reports will cover progress in implementing the ESMP and corrective actions, environmental monitoring results (including dust, noise, vibration, water and biodiversity), grievances received and resolved, land acquisition and compensation, incidents, and climate resilience. The independent environmental and social consultant will review performance during regular monitoring visits.

The ESMP and the Biodiversity Action Plan will be reviewed when construction is substantially complete, at the end of the defects liability period and every five years during operation, and will be updated as new monitoring information becomes available.

6. Glossary of Key Terms

Akimat	The local executive authority in Kazakhstan at regional, district or rural district level.
Category A	The highest environmental and social risk category under the Lenders' policies, requiring a full ESIA and the highest standard of environmental and social management.
CLO	Community Liaison Officer — the Project staff member responsible for day-to-day engagement with communities and for receiving grievances.
Critical Habitat	Under the Lenders' standards, an area of very high biodiversity value. The Shardara Reservoir area qualifies as Critical Habitat because of the Dalmatian pelican, pygmy cormorant and Syr Darya shovelnose sturgeon, which requires the Project to achieve a net gain for these species.
EPC Contractor	Engineering, Procurement and Construction contractor — the company responsible for designing and building the Project (Integra Construction KZ LLP).
ESIA	Environmental and Social Impact Assessment — a systematic study of the potential environmental and social effects of a project and the measures to manage them.
ESMP	Environmental and Social Management Plan — the document setting out how the mitigation and monitoring commitments of the ESIA will be implemented.
GBVH	Gender-based violence and harassment, towards which the Project has a zero-tolerance policy.
GRM	Grievance Redress Mechanism — the formal system for receiving, recording and responding to complaints about the Project.
IBA / KBA	Important Bird and Biodiversity Area / Key Biodiversity Area — sites recognised internationally as important for birds and biodiversity. The Shardara Reservoir is both.
KTZ	Kazakhstan Temir Zholy JSC — the national railway company of Kazakhstan and the implementer of the Project.
LARP	Land Acquisition and Resettlement Plan — the plan setting out how land is acquired, compensation is paid and livelihoods are restored.
Lenders	The international financial institutions considering financing for the Project: ADB, IFC and AIIB.
LOTOK	A raised concrete open channel used locally to carry irrigation water.
Net gain / No net loss	Commitments under the Lenders' biodiversity standards to leave biodiversity better off overall (net gain), or at least no worse off (no net loss), after mitigation and offsets.
NTS	Non-Technical Summary — this document.
Offset	Conservation actions carried out away from the Project site to compensate for biodiversity losses that cannot be avoided or reduced.
OVOS	The national environmental impact assessment prepared under the Environmental Code of Kazakhstan.

Passing loop	A short section of additional track that allows trains travelling in opposite directions to pass each other on a single-track railway.
SEP	Stakeholder Engagement Plan — the plan for communicating and consulting with affected communities and other interested parties.
Tugai	Riverside woodland and scrub typical of Central Asian river floodplains, dominated by Euphrates poplar, oleaster and tamarisk.