



REPORT

Mirny (Kazakhstan) 1GW Wind Farm Project
ESBS Report Chapter 05 - Baseline conditions, Socio Economic

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APPENDICES

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5.0 BASELINE CONDITIONS – SOCIO ECONOMIC

The analysis of the Project site-specific impacts is based on the information and data collected and detailed in this chapter. Primary data is directly collected onsite, while secondary data is sourced from previously conducted studies and from publicly available databases.

Primary baseline data gathered helped understand the context at the Project site while secondary data have integrated the assessment.

This chapter describes the baseline Social conditions using information summaries, tables numbers, maps, graphs and other tools that allow a concise presentation of the key contextual for supporting identification and analysis of Project impacts.

5.1 Methodology

The methodology for this Social Assessment aims to establish a comprehensive understanding of the social baseline conditions in the Project area of influence. This chapter details the approach adopted, including the desktop study, the site visits, the community engagement, and data collection techniques involved in social baseline studies. Social surveys were performed in different location of the Project AoI to inform this baseline; the present study will refer to such locations as Survey Areas.

5.1.1 Desktop Study

Prior to the field visits, a desktop study was conducted to gather existing secondary data relevant to the social context of the Project area. This included:

- **Literature Review** - Reviewing reports, studies, and publications concerning socio-economic conditions, demographic data, and cultural characteristics of the local communities;
- **Policy Analysis** - Analyzing local, regional, and national policies affecting the communities and regulations relevant to the proposed Project;
- **Stakeholder Identification** - Identifying key stakeholders, including NGOs, local governance structures (akimat), community organizations, and resident groups.

This desktop activity helped understand the overall socio-economic conditions and define the exact focus of subsequent fieldwork.

5.1.2 Field Study

WSP social team visited the Project site. The local experts Abat Amankul and Yuliya Allakhverdiyeva conducted the Project site visit from July 8th to July 11th 2024.

The site visit agenda is presented in the following table.

Table 1: Project site visit agenda

Date	Description of Activities
8 July 2024	08:00 – 13:00: Travel from Almaty to Ulken Village. 13:00 – 13:30: Arrival to Ulken Village and accommodation at the hotel. 13:30 – 14:30: HSE Induction and Training. 14:30 – 17:30: Discussion and planning of site visit with Aktas Energy LLP and IAF.
9 July 2024	Team 1: Yuliya Allakhverdiyeva (WSP), supported by Marat Amirseitov and Abzal Mukhtarbekov (Aktas Energy LLP):

Date	Description of Activities
	<p>06:30 – 07:00: Travel from Ulken in Shyganak Village.</p> <p>07:00 – 07:30: Social survey in Shyganak Village.</p> <p>08:00 – 09:30: Social survey in Kiyakty Village.</p> <p>10:00 – 16:00: Engagement in various activities in Mirny Village, including a meeting and public consultation at the akimat with stakeholders, a desktop document review, and a social survey.</p> <p>16:00 – 16:30: Social survey in Sholpan Village, including a visual assessment of an active quarry and uranium mine at the vicinity of the village.</p> <p>16:30 – 18:00: Social survey of herders in the project area and surrounding vicinities, focusing on pre-determined areas such as the Shu Meteomast area and Mirny Camp area.</p> <p>18:00 – 19:30: Travel back to Ulken Village.</p> <p>Team 2: Abat Amankul (WSP) with Lab Team:</p> <p>06:30 – 09:00: Travel from Ulken to Project area.</p> <p>09:00 – 17:00: Social survey of herders in the project area and surrounding vicinities, including the Shu Meteomast area, Mirny Camp area, 27 km Sapun Hill area, and projected overhead line and road crossing areas.</p> <p>17:00 – 18:30: Travel back to Ulken Village.</p>
10 July 2024	<p>WSP's Abat Amankul and Yuliya Allahverdiyeva, supported by Aktas Energy LLP's Marat Amirseitov, Kairat Seitkaliyev, and Abzal Mukhtarbekov, conducted the following activities:</p> <p>06:30 – 08:00: Travel from Ulken in Shyganak Village.</p> <p>08:00 – 09:30: Social survey in Khantau Village, including a meeting with local akimat employees and residents.</p> <p>09:45 – 10:15: Social survey at the road crossing with the 500 kV OHTL on the route to Moiynkum Village.</p> <p>10:30 – 12:00: Activities at Moiynkum Akimat, meeting with the Akim, business development department, and land management department.</p> <p>12:45 – 13:15: Social survey at another road crossing with the 500 kV OHTL on the route to Shu Town.</p> <p>15:45 – 16:30: Visit to Shu Substation, including a meeting with the chief engineer and a walkthrough of the substation.</p> <p>17:45 – 18:30: Social survey in Kenes Village, the only village crossed by the projected OHTL in the vicinity.</p> <p>18:30 – 20:00: Travel back to Ulken Village.</p> <p>20:00 – 20:30: Social survey in the vicinities of Ulken Substation.</p>
11 July 2024	<p>9-00 – 11:00: Travel from Ulken Village to Kanshengel Village to meeting with OkhotZooProm</p> <p>11:00 – 14:00: Meeting with OkhotZooProm</p> <p>14:30: WSP team leaves to Almaty</p>

The followin figures illustrate the Project area covered by the survey on July 9 and 10, 2024.

As clearly pointed out, the survey areas covered include both the Project site surroundings and the OHTL track. Access roads have not been included, considering that the surveys were conducted at a time when the exact routes were not yet confirmed. Also, the location of the surveys mainly focused on the areas nearby the communities and the WPP site. It is noted that no communities were observed during the surveys in the surroundings, except those mentioned in this document. The part that needs to be further investigated is the presence of nomadic shepherds, but a detailed census is already scheduled in the scope of the land acquisition

development in order to cover the impact on vulnerable groups both nearby the WPP site, the villages also all along the OHTL and access roads routes.

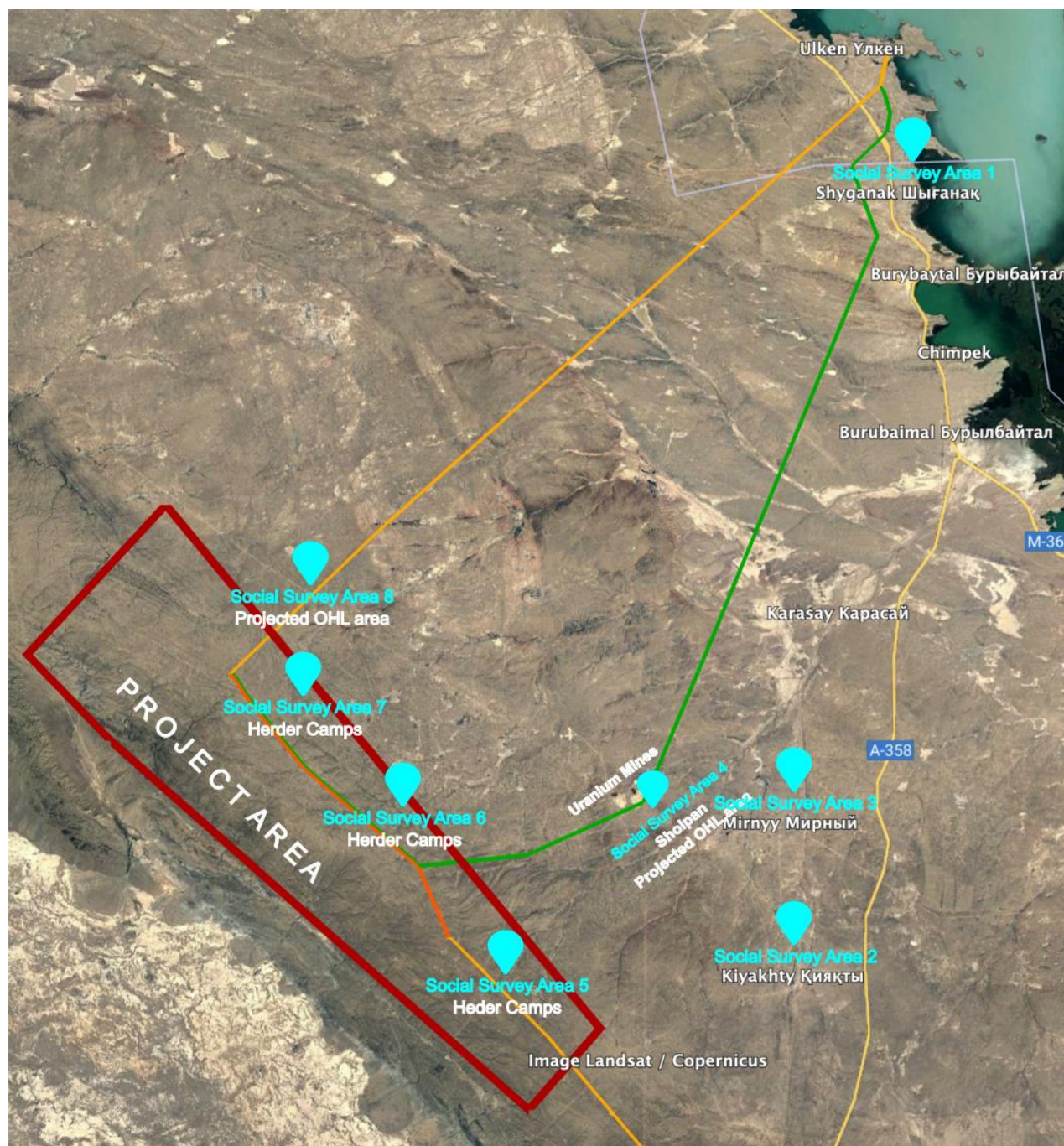


Figure 1: Social Surveys Locations covered on 9 July 2024¹

¹ The map has been produced at the time of drafting the baseline therefore it is not up to date. As of February 2025, the option chosen for the route of the OHTL is the one going through Ulken (in orange on the map). This has been reflected in the Impact Assessment.

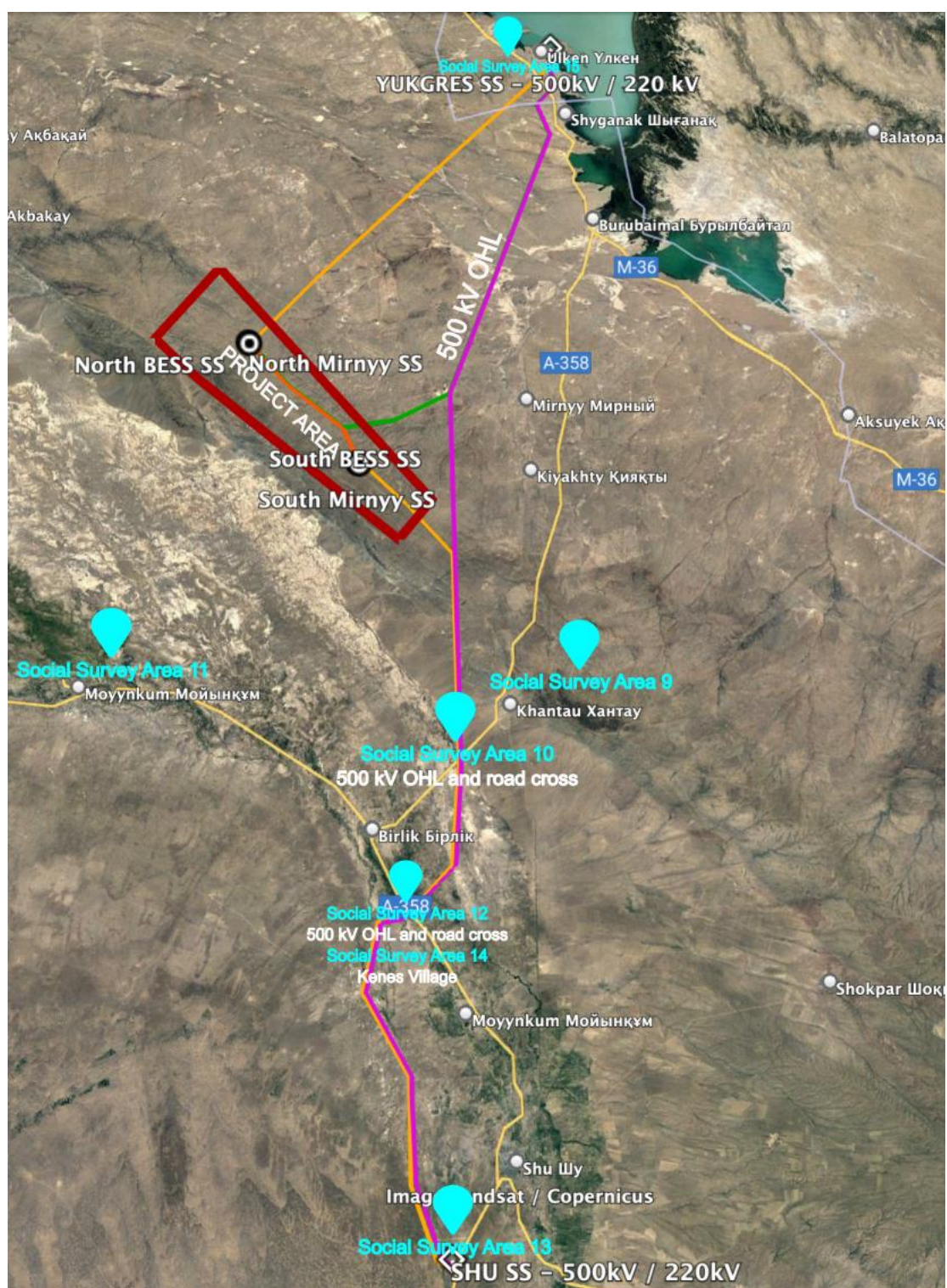


Figure 2: Social surveys Locations covered on 10 July 2024²

Below is an overview of the site visit outcomes; further details are presented in the site visit report, which also includes a photolog, available as **APPENDIX B**.

² The map has been produced at the time of drafting the baseline therefore it is not up to date. As of February 2025, the option chosen for the route of the OHTL is the one going through Ulken (in orange on the map). This has been reflected in the Impact Assessment.

Visit to Mirny Village

A site visit was conducted to Mirny village, which is the closest community to the Project site. This visit was facilitated by the local governing body (akimat) and included the following steps:

- **Meeting Organization** - A meeting was organized with community members to inform them about the Project and provide an opportunity for dialogue. Details regarding the Project were presented, including its objectives, expected benefits, and potential impacts on the community;
- **Aktas Energy LLP Representatives Engagement** - Representatives from Aktas Energy LLP participated to the meeting to address questions and concerns raised by the villagers, fostering transparency and open communication.

Structured Interactions

Following the meeting, structured interactions were conducted with villagers:

- **Social Survey Questionnaire** - A social survey questionnaire was developed prior to the field visit and administered to each villager present during the meeting. Questions focused on demographics, livelihoods, cultural practices, and perceptions regarding the project;
- **Individual Interviews** - Each villager present at the meeting was asked detailed questions based on the social survey questionnaire to gather qualitative insights.

Further Engagement with Akimat

After the community meeting and individual meeting with representatives from the akimat was conducted to obtain additional information on previous community development initiatives, local challenges, and aspirations that may be pertinent to the Project's planning and implementation.

Expanded Interviews in Adjacent Villages

In addition to Mirny, further interviews were conducted in the surrounding villages including Shyganak, Sholpan, Kiyakty, Khantau, Moiynkum, Ulken and Kenes. This expanded outreach, aimed at capturing a broader perspective on the social implications of the proposed Project. The methodology included:

- **Local Governing Bodies Discussions**, held with local akimats to gather information and diverse viewpoints on the Project;
- **Interviews with Local Stakeholders, including** local leaders, residents, and representatives to gather context-specific information.

Field Observations

During the villages site visits, field observations were carried out to complement the data collected through interviews and questionnaires. This included:

- **Community Walkthroughs** - Walking through Mirny and other villages with Aktas Energy LLP representatives, observing community infrastructure, housing conditions, and local economic activities;
- **Contextual Assessment** - Noting social dynamics and interactions among community members, as well as potential areas of concern related to the Project's impact.

Data Analysis

Data collected from surveys, interviews, and field observations were compiled and analyzed to identify trends, key issues, and community sentiments regarding the project.

5.1.3 Identification of the Area of Influence

The potential social impacts on local communities and stakeholders are assessed in the context of the Project Area of Influence (AoI). This section outlines the AoI, which encompasses both the area of the Project where direct effects will be generated, and surrounding regions that may experience indirect social effects. For the study, it was considered a radius of 10 km around the site in addition to the footprint of the access road and the OHTL, as per Figure 6 under Chapter 2 – Project Description.

5.1.3.1 Core Area

The core area of social influence includes the immediate footprint of the wind farm itself, which consists of:

- The physical site of the wind turbines, including the land upon which the turbines will be installed, the access roads, and other infrastructure such as substations and connection points to the power grid;
- The operational zone, which encompasses areas required for maintenance and monitoring of the wind farm, as well as any temporary facilities erected during the construction phase (e.g., worker accommodations, equipment staging areas).

Herder Activities

Within the core area, have been observed herders whose livelihoods depend on grazing their livestock on the land designated for the wind farm and surrounding areas. The herders are typically based in seasonal camps which are temporary structures only used during grazing periods. These herders play a significant role in the local economy and cultural identity of the region. Key considerations regarding the herders in this area include:

- **Livestock Management** - The herder and their herds, comprising sheep, horse, or other animals, utilize the land for grazing, affecting their daily activities and traditional practices. Their access to grazing areas is vital for the health and productivity of their herds;
- **Potential Impacts** - The construction and operation of the wind farm may affect grazing patterns and the availability of land for livestock. This could lead to conflicts over land use and necessitate discussions about compensation or alternative grazing strategies;
- **Cultural Practices** - Herders often have deep cultural ties to the land, which may be disrupted by the introduction of large-scale industrial projects like wind farms. It is essential to engage with these herders to understand their concerns and incorporate their inputs into project planning;
- **Economic Considerations** - The herder may receive both positive and negative economic impacts from the wind farm. Potential benefits include job opportunities (for construction and maintenance), while negative impacts may stem from reduced access to grazing land or disturbances during construction.

This core area, particularly the activities of herders, significantly influence the social fabric of the region and must be considered in the overall assessment of Project impacts.

5.1.4 Identification of the Survey Area

The survey area for the Project Social Baseline Study has been strategically defined to encompass the communities likely affected by the construction and operation phases, in consideration of the potential direct and indirect impacts of the Project on nearby populations. By engaging with residents from these villages, the survey aims to capture a comprehensive understanding of the community's needs, expectations, and possible changes deriving from the Project.

Geographical Scope

The survey area primarily includes the villages of Mirny, Kiyakty, Sholpan, and Shyganak, which are the closest communities to the proposed wind farm site. Mirny Village is located approximately 26 km away, while Kiyakty Village is about 21 km distant. Both of these villages, along with Sholpan and Shyganak, serve as focal points for understanding potential social impacts, as they represent the communities closest to the Project. Additionally, the villages of Ulken and Kenes will experience minimal impact during the building of overhead lines. Given the brief duration of the construction activities, the anticipated social impact is expected to be negligible.

Key Locations

- **Mirny Village** - As the nearest community to the Project, Mirny is critical for assessing the direct social and economic impacts, including potential changes in local economy and community dynamics;
- **Kiyakty Village** - This village's proximity to the Project warrants inclusion for understanding how construction activities may affect livelihoods, particularly in terms of job creation and access to services;
- **Sholpan Village** - While very small, with only two houses and two granite mining companies (one currently inactive), Sholpan's inclusion provides insights into the impacts on very localized populations and potential employment opportunities linked to the Project;
- **Shyganak Village** - Recognizing this community completes the survey area by accounting for additional social aspects and potential benefits arising from increased economic activity in the region;
- **Kenes Village** - The village will be affected by the construction of the OHTL because is in its vicinity, with the closest point being approximately 500 m from the residential area;
- **Ulken Village** - The village will be affected by the construction of the OHTL swithing to Yukgres Substation, with the closest point being approximately 1 km from the residential area.

The following figure illustrates the location of the communities potentially impacted by the Project.

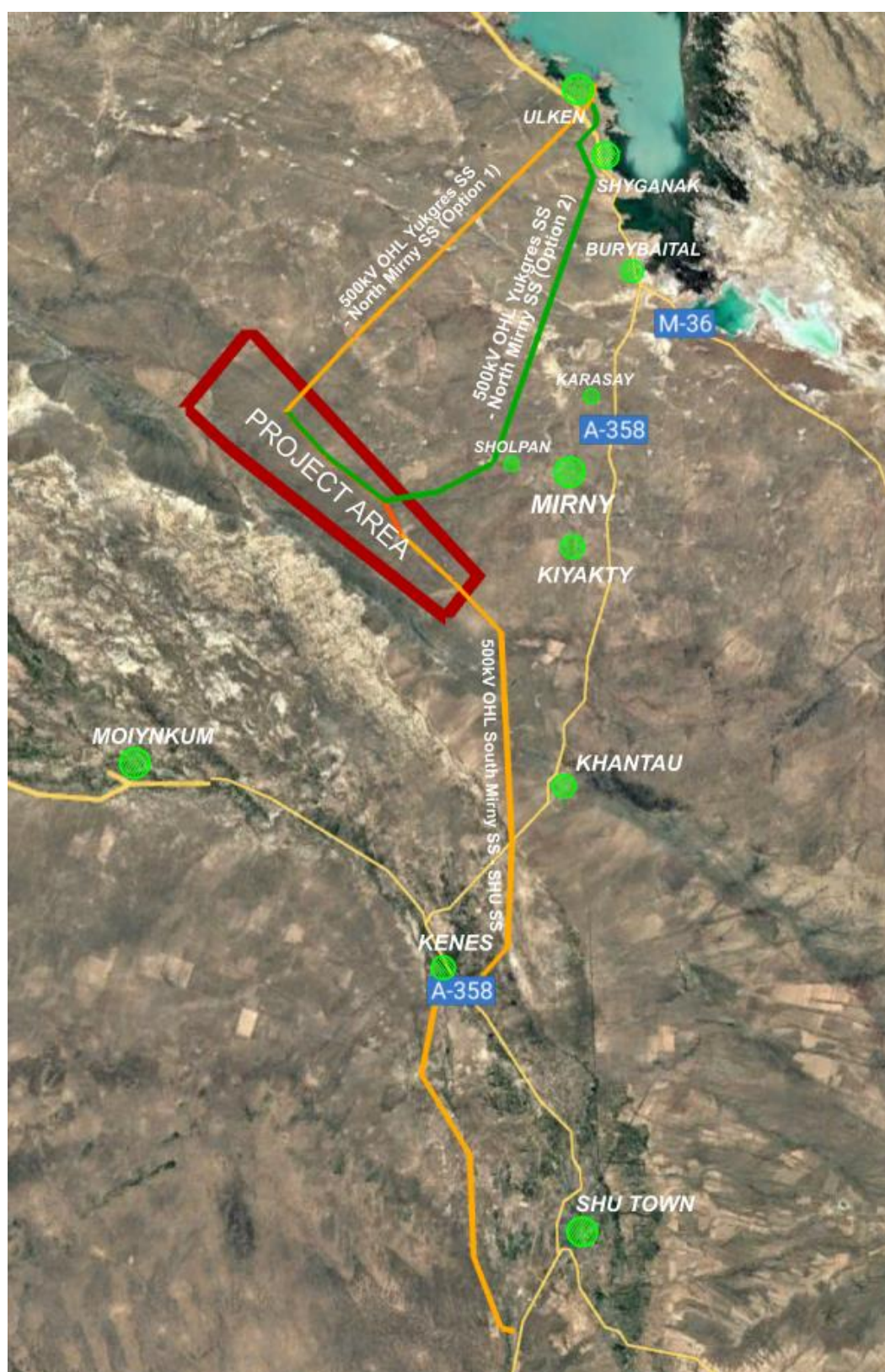


Figure 3: Communities potentially impacted by the Project³

³ The map has been produced at the time of drafting the baseline therefore it is not up to date. As of February 2025, the option chosen for the route of the OHTL is the Option 1 going through Ulken (in orange on the map). This has been reflected in the Impact Assessment.

5.1.5 Secondary sources of information

Secondary sources of information provide valuable insights and context by interpreting, analysing, or summarizing primary data or research. For the purposes of this social baseline assessment, the following specific secondary sources have been identified:

- **Akimats Statistical Reports** - These reports, published by local governmental bodies (akimats), contain statistical data and analyses regarding various socio-economic indicators within their administrative areas. They serve as a reliable source of information on demographics, employment trends, infrastructure development, and other key factors relevant to communities affected by the Project;
- **State Statistical Agency Website (www.stat.gov.kz)** - This official website aggregates a wide range of statistical data published by the government of Kazakhstan. It includes national and regional statistics on population demographics, economic performance, social indicators, and other datasets that can inform the social baseline study;
- **Publications** - News articles focusing on various villages, such as Mirny, Kiyakty, Sholpan, and Shyganak, serve as valuable secondary sources of information for understanding the socio-economic conditions and community dynamics surrounding the Project. These articles provide insights into local challenges, economic activities, and public concerns, highlighting issues like access to services and potential impacts on local businesses.

5.1.6 Primary Sources of information

Primary sources of information are essential for capturing firsthand data directly relevant to the social assessment of the Project. In this context, primary sources include direct interactions with local communities through structured interviews, surveys, and focus group discussions held with residents of villages such as Mirny, Kiyakty, Sholpan, and Shyganak. Mirny and Sholpan residents were invited via What's App group. The residents of Mirny village present at the meeting are shown in the following table.

Table 2: Residents of Mirny Village who participated to the meeting on 9 July 2024.

Occupation
Akim of the Mirny Village
Library Assistant (akimat employee)
Paramedic
Retired persons
Head of local Club
Labour Exchange (currently does maintenance works at akimat)
Labour Exchange (currently does maintenance works at akimat)
Akimat Security
Akim's Driver
Unemployed at Labour Exchange, (cook by profession)
Messenger and cleaning lady at akimat
Head of the Library
Akimat Employee
Akimat Employee

5.2 Population and demography

5.2.1 Administration and governance

The Project site and proposed HV line routes are mainly located within the Moiynkum District of the Jambyl Region of Kazakhstan (see the figure below). A section of proposed HV lines toward Shu Substation extends into Shu District. A small portion of proposed HV lines (both Options 1 and 2) toward Yukgres Substation near Ulken Village crosses into Jambyl District of Almaty Region.



Figure 4: Project Area within Jambyl Region Map.

Moiynkum district encompasses several rural districts, each governed by local administrative bodies known as akimat. These akimats play a crucial role in overseeing local governance, providing essential services, and addressing the needs of the community [3]. The following rural areas are in Moiynkum District:

- Binazar Rural Area;
- Birlik Rural Area;
- Jambyl Rural Area;
- Kenes Rural Area;
- Karaboget Rural Area;
- Kyzyltau Rural Area;
- Ulanbel Rural Area;
- Khantau Rural Area;

- Aksuyek Rural Area;
- Mynaral Rural Area;
- Shyganak Rural Area;
- Moiynkum Rural Area;
- Mirny Village;
- Kalyshbay Rural Area; and
- Kyzyltal Rural Area.

Mirny village has its own akimat. Kiyakty and Khantau are part of Khantau rural area, with akimat located in Khantau. Shyganak rural area's akimat is located in Shyganak. Sholpan is under akim of Mirny village. There are only 2 houses in Sholpan, one of which is occupied by workers.

5.2.2 Political and institutional framework

The population surrounding the Project site resides in challenging and unstable conditions. Many families struggle with essential needs, such as access to clean drinking water for themselves and their livestock, as well as adequate resources for their gardens. Additionally, the lack of a reliable cellular network and internet connectivity further isolates these communities from vital information and communication [10, 11].

In such an environment, where the primary source of income is often tied to the government, residents may feel hesitant to express their political preferences openly, mindful of living in an authoritarian context. Although akims (local leaders) are officially elected, they frequently emerge from the existing political framework, predominantly representing the former Nur Otan party, now known as Amanat.

Furthermore, there appears to be limited visible opportunity for economic revival in the Mirny area. The akim of Mirny operates with a notable dependence on the Moiynkum akimat, which in turn relies on the regional akimat for support. Unfortunately, this hierarchical relationship often results in insufficient funding for local initiatives and development. While there are several mining enterprises in the vicinity, many of these companies are registered in larger urban centers such as Almaty or Astana, leading to a disconnect between the district and the financial benefits generated by these operations. Consequently, the Moiynkum district does not experience a direct flow of funding from these enterprises, leaving it reliant on the decisions and allocations from higher authorities. This complex landscape reflects the challenges that the community faces as it seeks pathways toward economic sustainability and growth.

Within the communities there is a slight tension among the Kazakh and Russian populations that stems from inherent cultural differences.

The Kazakh culture places a strong emphasis on respecting elders and maintaining livestock, which contrasts with the experience of some Russian families, where elders may find themselves more isolated, having been less involved in day-to-day activities. This cultural disconnect has led to complaints from some Russian neighbours to the akimat regarding the smell of livestock, illustrating the misunderstandings that can arise from differing lifestyles. While there are no radical points of contention, these subtle cultural differences have prompted discussions within the Mirny akimat regarding the political climate, interethnic relations, and religious situations in the village. As a result, efforts have been made to provide educational outreach aimed at preventing interethnic and religious tensions, fostering greater understanding and harmony within the community.

5.2.3 Population and demographics

Jambyl Region

Jambyl Region, located in the south of the Republic of Kazakhstan, was established in 1939 and has a total area of 144.3 thousand km², primarily characterized by flat terrain. The Region shares borders with the Karaganda Region to the north, the Kyrgyz Republic and South Kazakhstan Region to the south, and Almaty Region to the east. As of 2023, Jambyl Region is comprised of 10 districts, the city of regional subordination - Taraz, and three cities of district subordination - Karatau, Zhanatas, and Shu, along with 367 settlements.

The demographic profile of Jambyl Region shows a population of approximately 1.16 million people, with urban residents making up about 40% (approximately 465,000) and rural residents approximately 60% (about 691,000). The region is approximately evenly split between genders, with approximately 49.5% men (around 575,000) and 50.5% women (roughly 580,000). The population experienced a slight increase from the previous year, with growth primarily observed in Taraz and several districts, including Baizak, Jambyl, and Shu.

Economically, Jambyl Region has a diverse industrial landscape. The average monthly nominal wage for employees in large, medium, and small enterprises (excluding small businesses) reached approximately 184,408 tenge in the third quarter of 2021, reflecting a significant increase over previous years. The labour force, consisting of around 528,600 individuals aged 15 and older, shows a high employment rate of 95.1%, indicating a healthy job market. The majority of employment is concentrated in organizations, with 78.7% of hired workers belonging to this sector, while self-employment accounts for 33.6% of the workforce, with significant representation in agriculture (56%) and trade (28.5%).

Transport infrastructure in the Region is well-developed, with the Shu-Petropavlovsk railway running along the western shore of Lake Balkhash. Key railway stations, such as Kiyakty, Karasai, Burubaytal, and Shyganak, facilitate connectivity. The settlement of Mirny is located 12 km north of Kiyakty station, while Akbakai, with approximately 2,700 residents, lies 15 km northwest and serves as a base for the Akbakai gold ore cluster and the Akbakai mining and processing plant. All settlements and railway stations are interconnected with major highways, including the Almaty-Karaganda and Karaganda-Bishkek roads, enhancing accessibility throughout the region.

Overall, Jambyl Region has demographic stability, economic potential, and robust infrastructure, positioning it well for continued development and investment, including potential renewable energy initiatives.

Moiynkum District

Moiynkum District, located in the Jambyl Region of Kazakhstan, was established in 1964 and spans an area of 5,045.1 km². Known for its diverse landscape, the district features a mix of agricultural land and semi-desert areas, making it suitable for livestock breeding and crop production. Approximately 5,408 hectares of arable land support local farming activities, driven predominantly by agriculture. The economy of Moiynkum is primarily supported by local communities engaged in farming and animal husbandry.

The district comprises 24 settlements in 14 rural areas, including the administrative center in Moiynkum village, which provides essential services and infrastructure for residents, including a railway station, bus terminal, sports center, mosque, and museum. The population is recorded at 32,048 residents [8].

The Akbakay gold ore deposit is located 60 km northeast of Moiynkum village. In terms of industry, the Mynaral Cement Plant operates in the district, creating approximately 300 permanent jobs. Additionally, the granite mining companies Orgstroy and Turan are located in Sholpan village, while the Shagala Mining Company focuses on copper mining, and Khantau Minerals, a gold mining company, employs 96 people. The District's strategic location and rural setting make it an area of interest for development projects, including renewable energy initiatives, which could contribute to economic growth and sustainability in the region. The cattle driving route in Moiynkum District occupies 155,395 hectares, further emphasizing the importance of livestock farming to the local economy. The following table reflects number of livestock by rural district.

Table 3: Livestock by Rural Districts.

No	Rural District	Camels	Horses	Large Cattle	Small Cattle	Poultry
1	Ulanbel	75	191	1532	6585	565
2	Karabuget	15	302	1921	10005	4100
3	Kylyshbay	23	181	1029	4081	565
4	Moiynkum	16	34	976	5842	5817
5	Jambyl	-	62	943	2611	864
6	Kushaman	8	151	557	1440	688
7	Kyzyltal	15	128	698	3260	1014
8	Berlik	-	291	1116	4749	4964
9	Kenes	-	131	1310	2382	2761
10	Binazar	-	195	671	5114	3287
11	Khantau	1	220	549	7000	712
12	Mirny	-	64	53	2831	229
13	Akbakay	-	134	21	-	112
14	Aksuyek	-	3	63	1086	234
15	Shyganak	-	164	272	903	314
16	Mynaral	-	369	257	551	0
Total		153	2620	11968	58440	26226

Shyganak Settlement

Shyganak village located 65 km from site is home to approximately 3,000 residents, with 70% of the population employed at the local railway station, which serves as a major source of employment for the community. Additionally, about 10% of villagers work at Sine Midas Stroy and CITIC Construction companies, highlighting the role of construction in the local economy. Historically, around 20% of the population engaged in fishing; however, recent reports indicate a decline in fish availability, impacting this livelihood.

One of the most pressing challenges for Shyganak residents is the scarcity of water resources [2]. The village has struggled with inadequate access to clean drinking water for years, forcing families to rely on distant water sources or expensive bottled water for their daily needs [7]. This situation has created significant burdens on the community, affecting their health, sanitation, and overall quality of life.

The village is equipped with essential facilities, including a hotel, canteen, medical station, firefighting brigade, and a village police department consisting of eight personnel. There is also a community center.

Khantau and Kiyakty villages

Khantau (30 km from site) and Kiyakty (16 km from site) villages, situated within the same rural area, represent two small communities facing their own unique challenges and developments. According to statistics from the Khantau Akimat, the total population of Khantau rural area is approximately 1,800 people, while Kiyakty has a population of around 225 residents. However, there seems to be a local perception that the actual number of inhabitants is much lower, a sentiment that reflects the demographic shifts impacting these villages.

Khantau is home to a school that serves the educational needs of its residents, providing essential services to the community's youth. Nearby, Kiyakty has recently constructed a mosque, a development that has instilled a sense of pride among the villagers. This mosque not only serves as a place of worship but also as a community gathering space, reinforcing cultural and social ties.

In both villages, the primary economic activity revolves around livestock farming, with many families engaged in raising animals as a vital source of income and sustenance. This agricultural focus is emblematic of the traditional lifestyle characteristic of the Region.

While residents have access to the internet, which facilitates communication and information exchange, Kiyakty struggles with scarce access to water, posing a significant challenge for daily living and agricultural practices. However, access to essential services remains a challenge. The nearest doctor and firefighting brigade are located in Birlik, approximately 36 km away from Khantau, complicating residents' access to healthcare and emergency response services. This geographic distance further highlights the challenges faced by these small communities in meeting their basic needs and improving overall quality of life. As both Khantau and Kiyakty navigate the realities of rural living, their close-knit communities continue to adapt and strive for growth amidst various challenges.

Mirny Village

Mirny Village once had a population exceeding 5,000 residents. During its peak, the village was equipped with numerous modern amenities, such as a canteen, a cinema, a shop, a health resort, a hotel, a restaurant, a bakery, a sports complex, a technical college, a music school, a ten-year school, a kindergarten, and hospital. The village boasted reliable drinking and irrigation water for private households and gardens, making it a model of civilization [4].

Mirny was connected to nearby large towns by scheduled flights on small aircraft. Train services were connecting the village to the Kiyakty station, where buses greeted passengers arriving from other locations. During this prosperous time, private vehicles were rare, despite the decent earnings of local workers, who benefited from various bonuses, including the "desert" allowance for those employed in the nearby mining operations.

The village lived up to its name, as Mirny was known for its tranquillity, devoid of theft, murder, and crime. In the 1980s, a tragic incident involving a local resident became a major public event. Old-timers still recall how green and well-maintained the village was, with irrigated fountains operating around its perimeter.

Mirny Village, once a vibrant community and a hub for uranium mining, now faces significant challenges as its population dwindles to just 674 residents, a statistic that belies the reality observed in the village. The closure of mining operations led to a dramatic decline in population, with many former inhabitants relocating to urban areas such as Karaganda, Moiynkum, Bishkek, and Shu in search of better opportunities. The departure of families and individuals seeking a brighter future has created an unsettling emptiness, with the streets and shops far less bustling than they once were.



Figure 5: Ruins in Mirny (Photos by Leonid Rasskazov – Tengrinews.kz [4]).

Among the remaining residents, there are 70 pensioners, the majority of whom are merely listed as living in Mirny to receive a more favorable pension. The village's education system serves a small number of youths, with only 56 school students, highlighting a concerning trend of young people leaving in search of work and better prospects. The active population, numbering 306, includes 66 people working in enterprises, with the government, through the akimat (local governing body), serving as the primary employer in the area. Many residents are self-employed (15) or manage household responsibilities (30 housewives).

All essential facilities, including the post office, library, and community club, are located within the akimat. The library has adapted to serve as an internet shop where residents can access e-gov.kz online services, providing vital connectivity and support for the local community. While the village retains these essential services, including five shops struggling to meet dwindling demand and healthcare facilities staffed by two doctors, a paramedic, and an ambulance driver, the long-term viability of these institutions is uncertain due to the declining number of residents.

Demographically, Mirny is predominantly composed of Kazakh (325) and Russian (295) residents, with smaller groups from other ethnic backgrounds.

The graph below shows the number of people migrating from Moyunkum district from 2009 to 2022. The number of migrants has been fluctuating over the years, with some years seeing an increase and other years seeing a decrease. Overall, the trend is one of decline, with the population of Moyunkum district decreasing from 43.7 thousand in 1999 to 32 thousand in 2024.

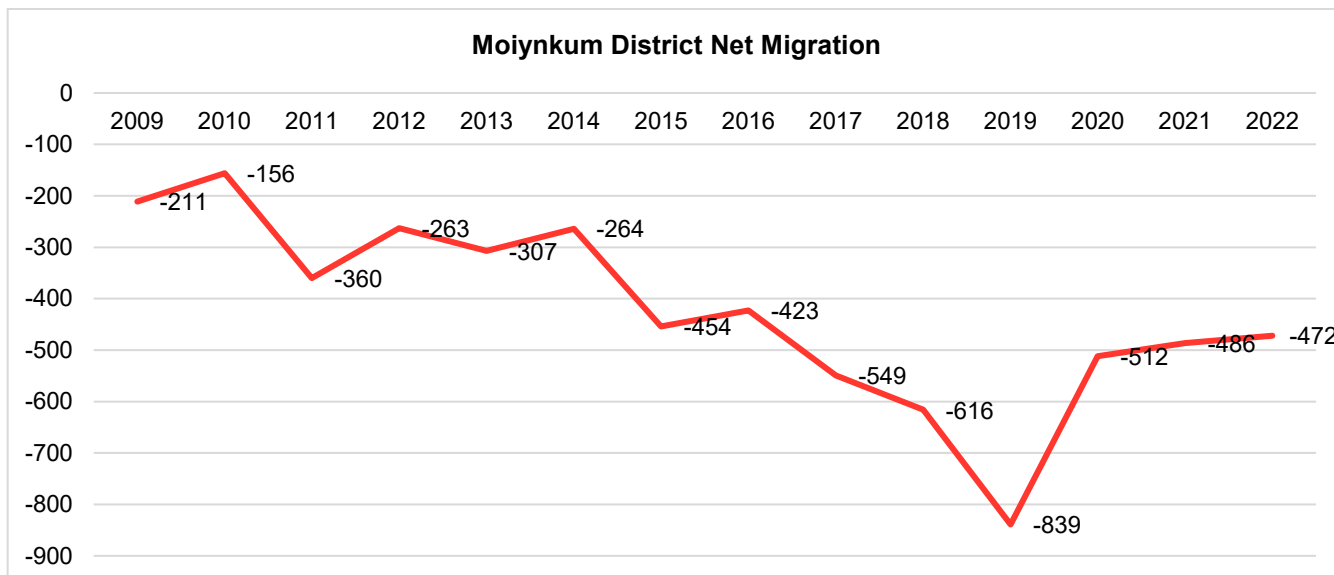


Figure 6: Moiynkum District Net Migration.

5.2.4 Vulnerable groups

Vulnerable groups are defined as those who, by virtue of gender, ethnicity, age, physical or mental disability, economic disadvantage, or social status may be more adversely affected by Project impacts than others. They may be limited in their ability to claim or take advantage of assistance provided by the Project and related development benefits (IFC, 2002, p. xi).

Social impacts are often experienced very differently by men and women. Rather than carry out a separate gender analysis, the aims of the stakeholder engagement in the framework of the social impact assessment will be to mainstream gender, so that is considered in all stages. In a similar manner, the issues and concerns of minorities must be identified and addressed.

A list of groups that could be vulnerable or disadvantaged in relation to the Project is presented below and is based on the outcomes of the socio-economic baseline study performed, field observations, interviews and secondary data sources. This list will be refined throughout the stakeholder engagement activities:

- Informal land users (herders): nomadic people or herders may have specific resource or land- use dependance and they could be underrepresented in decision making processes. Site visit observations and discussions conducted by WSP in July 2024 suggest that certain communities within the Project site may rely on grazing areas as a vital component of their livelihoods. Any disruption to these areas could significantly impact their way of life, posing challenges in securing alternative livelihoods or adapting to new grazing routes.
- Isolated rural communities: most of the settlements around the Project site have experienced depopulation in recent decades. This includes communities in Khantau, Kiyakty, Mirny and the residential area in Sholpan. These areas are characterized by limitations in livelihood and infrastructure access and water scarcity. These communities may suffer disproportionate impacts from any disruption to access routes or livelihoods.

- Elderly: members of households who may have restricted mobility and more sensitive to health-related impacts. Participating in face-to-face consultations, and the physical move itself may be more challenging for this group. This group may be less able to adapt to economic and physical displacement.
- Persons with disabilities (including mental, chronic, and/or terminal physical illnesses) or households with people with disabilities: people with disabilities, as well as family members with caregiving responsibilities, may face heightened challenges and impacts due to the implementation of the Project. If they are required to relocate or experience a loss of economic livelihood, their vulnerability to Project-related impacts may increase, particularly in terms of their health and overall well-being. Given their sensitive physical and socio-economic status, these individuals may require additional support. Furthermore, households caring for disabled family members are statistically more likely to experience poverty, further exacerbating their susceptibility to adverse effects. These households may also find it harder to reach and access health clinics during the construction phase of the Project due to road closures and diversions;
- Women: women may have reduced access to resources and are more at risk of sexual harassment and gender-based violence. Therefore, project impacts may affect women more. It was estimated in 2023 that 16.5% of women in Kazakhstan aged 18-75 have experienced intimate partner violence in their lifetime.⁴ Furthermore domestic responsibilities fall on women, who dedicate 19% of their day to unpaid domestic labour. This disparity could hinder women's participation in engagement activities. Furthermore, women who are widows and heads of households may be more vulnerable than men to Project impacts due to restricted employment opportunities and lower wages;
- Poorer Households: Households depending on social aid or struggling to afford food often face greater financial hardship. Limited economic resources make poorer households more vulnerable to external shocks and environmental changes, which can affect their ability to adjust to resettlement. In 2023, an estimated 5.1% of Kazakhstan's population lived below the national poverty line. In the Jambyl region, poverty rate was higher than the national average, at 5,8%. However, rural areas experienced higher poverty levels, reaching 7.5%.
- Youth: official statistics show a trend of young people leaving rural areas in the Area of influence of the Project. Individuals without work experience, qualifications, or relevant skills may struggle to secure employment opportunities. Moreover, those who lacked a stable livelihood before resettlement began might not be included in livelihood restoration programs.

5.2.5 Indigenous Peoples

Under the IFC PS7 and the EBRD PR7, the identification of Indigenous Peoples (IP) is based on specific criteria, including self-identification, collective attachment to ancestral territories, distinct cultural practices, and customary governance structures. In Kazakhstan the population is composed of ethnic Kazakhs and other nationalities, none of which are recognized as Indigenous Peoples under international definitions. Further analysis has been made on nomadic herders found in the Project Aol in order to verify whether the IP criteria could apply. However, the outcome of the process is that such herders are Kazakh by ethnicity and are considered an integral part of the local community rather than indigenous peoples. This understanding forms the basis for excluding further investigation of IFC PS 7 Indigenous Peoples during the ESIA phase. Further details can be found in Table 4 below.

⁴ [SDG Report WEB](#)

Table 4: Comparison of IFC Performance Standard 7 Indigenous Peoples Criteria and Project Applicability

Criteria for consideration of 'indigenous peoples' according to IFC PS7	Justification for the Non-Applicability of IFC PS7 Criteria to the Project
Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others.	It has been confirmed by analysis conducted during the baseline phase, that the nomadic herders are Kazakh by ethnicity. Also, the herders with traditionally nomadic lifestyle in Kazakhstan do not identify themselves as 'indigenous' in a way that distinguishes them from other Kazakhstani. They view themselves as an integral part of the broader Kazakh society, have equal rights and access to all citizens of Kazakhstan and are protected under the country's general legal framework. Additionally, Kazakhstan does not have any specific laws that exclusively address the rights of the herders.
Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories.	Herders perform seasonal grazing activities, meaning that in different times of the year they live in permanent residences rather than following the nomadic lifestyle.
Customary cultural, economic, social, or political institutions that are separate from those of the mainstream society or culture.	Herders and pastoralism are embedded within the broader Kazakh and Central Asia cultural and lifestyle traditions and do not maintain separate institutions from the rest of the Kazakh population.
An indigenous language, often different from the official language of the country or region.	All herders in speak Kazakh and some also in Russian, which are the country's official languages. There are no identified indigenous languages among the herders community.

5.3 Land use and Ownership

In accordance with the Land Code, the Land Fund of the Republic of Kazakhstan is categorized into the following types based on their designated purposes:

- Agricultural land;
- Land within populated areas (including cities, towns, and rural settlements);
- Land designated for industrial activities, transportation, communications, space operations, defense, national security, nuclear safety zones, and other non-agricultural uses;
- Land reserved for specially protected natural areas, as well as for health, recreational, and historical-cultural purposes;
- Forest reserve land;
- Water resources land;
- Reserve land.

Within these classifications, the Project area and the areas traversed by the proposed HV line routes include agricultural land, industrial land, specially protected natural areas, forest reserve land, and reserve land.

Conducting a preliminary socio-economic assessment of these lands is essential for identifying socio-economic risks and appropriate Project planning.

A significant portion of the Project area (particularly the large northeastern part) lies on **Forest fund lands** (designated under cadastral number 06-093-064-008 in the figure below). According to Article 8 of the Forest Code of the Republic of Kazakhstan, Forest fund lands is defined as follows:

- Forest fund land is divided into state and private forest funds;
- State forest fund land includes land covered with forests of natural origin, artificial forests created with budgetary funds, and non-forested land (both forest and non-forest land), provided for permanent use to state organizations engaged in forestry;
- Private forest fund land includes land allocated to citizens of the Republic of Kazakhstan and non-state legal entities of the Republic of Kazakhstan without foreign participation, either in private ownership or long-term land use, in accordance with the Land Code of the Republic of Kazakhstan, for the purpose of afforestation, occupied by:
 - artificial plantations,
 - plantations of natural origin that have arisen from seed and/or vegetative means,
 - private forest nurseries,
 - special-purpose plantation ,
 - agroforestry plantations, and
 - protective plantations along the rights-of-way of privately owned commercial roads;
- The boundaries of state forest fund land are established and refined during land management activities based on forestry management materials;
- The alienation of state forest fund land through sale, mortgage, or other transactions is not permitted;
- The procedure for the allocation, withdrawal, and use of forest fund land is determined by the Forest, Land, and Civil Codes of the Republic of Kazakhstan.

A large central portion of the Project area, as well as some parts of its southern area, falls under **Reserve land** (highlighted in white on the figure below and in yellow on the following figure).

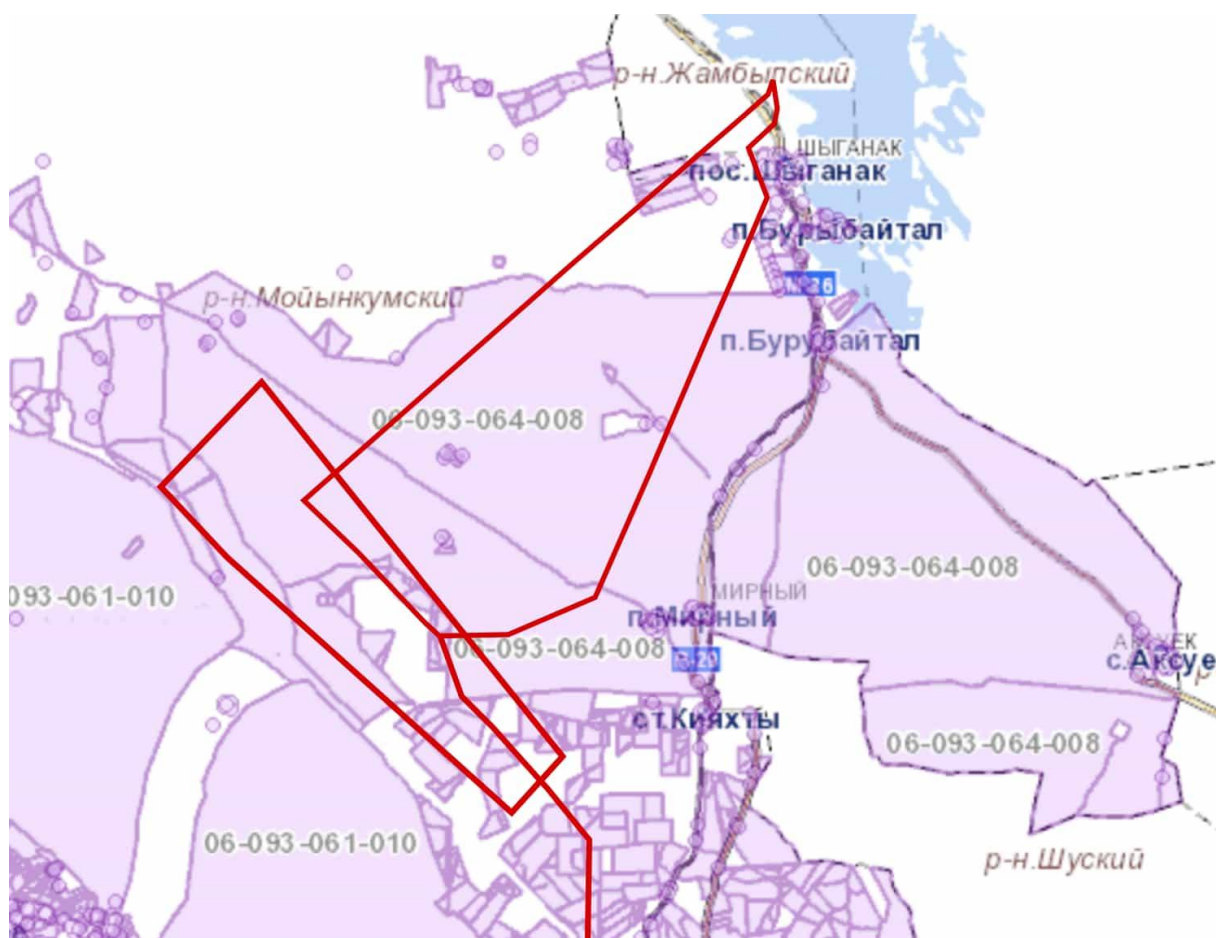


Figure 7: Land plots at the Project area.

According to Chapter 16 of the Land Code of the Republic of Kazakhstan, reserve lands are subject to the following requirements:

- Article 137. Composition of Reserve Lands - Reserve lands include all lands not allocated for ownership or land use, and they are managed by district executive bodies. Land plots where nuclear weapons tests were conducted are transferred into the reserve lands category by a decision of the Government of the Republic of Kazakhstan. The legal regime of such lands is determined in accordance with Art. 143 of the Land Code;
- Article 138. Allocation of Reserve Lands - Reserve lands are allocated for ownership or land use for agricultural needs, private forestry, industry, and other purposes in the manner and under the conditions established by this Code. The reclassification of reserve lands into other categories is carried out simultaneously with their allocation for ownership or land use. If reserve lands that were previously part of specially protected natural areas have not been reclassified into other land categories in accordance with the legislation of the Republic of Kazakhstan, such lands are reverted back to the category of specially protected natural areas in accordance with the Law of the Republic of Kazakhstan "On Specially Protected Natural Areas."

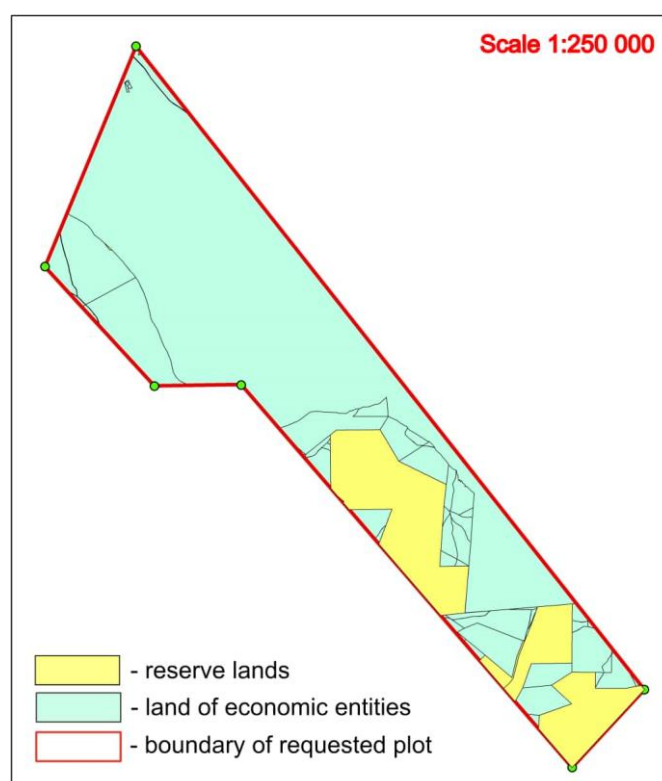


Figure 8: Explication of Preliminary Requested Land Plot prepared by RSE “NPCZem”.

General cadastral information on land distribution in Project area.

The Client preliminarily requested an explication for the land plot from the Republican State Enterprise "Scientific-Production Center of Land Cadastre" (shortly RSE "NPCZem"). According to the provided explication, the largest portion of the Project area (particularly the large northeastern part) lies on Forest fund lands. Among economic entities, here are also small areas along the northern boundaries of the Project area intended for granite extraction, belonging to ORGSTROY LLP. Among the agricultural lands, Moyinkum AGRO LLP stands out with large lands allocated for agricultural purposes in the northwestern part of the requested site. Additionally, land belonging to the individual Ospanbekov Tuleukhan, who has land for farming in the central western boundaries of the Project area, is notably significant. Furthermore, the Project area includes several small plots primarily owned by individuals for farming purposes. During the social surveys performed, it was assessed that a great part of these land users are not currently active and no economic activities are performed on those lands; however, this does not exclude that economic activities could be performed in the future by these land users.

Land users, both formal and informal (herders) were interviewed during the social surveys to gather insights regarding their perspectives on the potential Project. They all expressed that they do not have concerns about the Project, provided that the same conditions, especially regarding the restoration of water wells, are maintained following the Project's implementation.

The lands where the WPP will take place are currently used mainly for grazing purposes. No agricultural activities have been observed and there are no crops cultivated. One land user who was on-site confirmed that he has no objections to the Project and would relocate to another area if necessary. This highlights the need for communication and coordination with the Moyinkum akimat as the Project progresses. Ensuring that all stakeholders are informed, particularly about the final locations of the wind turbines, will be important for addressing any potential impacts on local herding activities and maintaining relations with the community.

It is important to understand that the Project area boundaries illustrated in the figure above is not the final one which is the final adjusted as per the land use agreements reached with all relevant stakeholders.

As of November 2025, preliminary identification of the land users and of project affected people (PAP) is provided under the Land Acquisition and Restoration Framework. Final data will be acquired during the livelihood restoration process and will be included under a dedicated Livelihood Restoration Plan (LRP).

5.4 Economy and employment

5.4.1 Country overview

5.4.1.1 *National consumer price index (IPCN)*

The Consumer Price Index (CPI) in Kazakhstan from 2022 to 2024 reveals notable trends in prices for goods and services, indicating fluctuations in inflation and economic conditions over this period. The data shows monthly percentage changes against the previous month, the previous year's corresponding month, and previous year's cumulative rates, providing a comprehensive view of consumer price movements [16].

Table 5: Consumer Price Index in the Republic of Kazakhstan

Consumer Price Index in the Republic of Kazakhstan (%)																
Period	To previous month			By December of the previous year					To the corresponding month of the previous year				To the corresponding period of the previous year			
	goods and services	goods		paid services	goods and services	goods		paid services	goods and services	goods		paid services	goods and services	goods		paid services
		food	non-food			food	non-food			food	non-food					
2022																
Jan	100,7	101,0	100,3	100,6	100,7	101,0	100,3	100,6	108,5	109,9	108,5	106,8	108,5	109,9	108,5	106,8
Feb	100,8	101,2	100,5	100,6	101,5	102,2	100,8	101,2	108,7	110,0	108,6	107,1	108,6	110,0	108,5	107,0
Mar	103,7	105,8	102,8	101,4	105,2	108,2	103,6	102,6	112,0	115,4	110,9	108,3	109,8	111,8	109,3	107,4
Apr	102,0	103,1	101,2	101,0	107,3	111,6	104,9	103,6	113,2	117,9	111,1	108,9	110,6	113,3	109,8	107,8
May	101,4	101,7	101,4	100,8	108,8	113,5	106,3	104,5	114,0	119,0	111,9	109,1	111,3	114,5	110,2	108,1
Jun	101,6	101,9	101,9	100,8	110,5	115,7	108,4	105,3	114,5	119,2	113,2	109,2	111,9	115,3	110,7	108,2
Jul	101,1	101,0	101,5	100,8	111,7	116,9	110,0	106,2	115,0	119,7	114,2	109,2	112,3	116,0	111,2	108,4
Aug	101,4	101,0	101,8	101,6	113,3	118,0	111,9	107,9	116,1	120,8	115,5	110,1	112,8	116,6	111,8	108,6
Sept	101,8	101,2	101,9	102,7	115,4	119,5	114,0	110,8	117,7	122,2	117,0	112,3	113,4	117,2	112,4	109,0
Oct	101,6	101,4	101,7	101,7	117,2	121,2	116,0	112,6	118,8	123,1	117,9	113,5	113,9	117,8	112,9	109,5
Nov	101,4	101,8	101,6	100,8	118,9	123,4	117,8	113,5	119,6	124,1	118,6	114,1	114,5	118,4	113,5	109,9
Dec	101,2	101,6	101,3	100,5	120,3	125,3	119,4	114,1	120,3	125,3	119,4	114,1	115,0	119,0	114,0	110,3
2023																
Jan	101,1	101,4	100,9	100,7	101,1	101,4	100,9	100,7	120,7	125,7	120,2	114,2	120,7	125,7	120,2	114,2
Feb	101,3	101,5	100,8	101,3	102,3	103,0	101,7	102,0	121,3	126,2	120,5	115,0	121,0	125,9	120,3	114,6
Mar	100,9	101,1	100,8	100,8	103,2	104,1	102,5	102,8	118,1	120,5	118,1	114,4	120,0	124,1	119,6	114,5
Apr	100,9	100,9	101,3	100,4	104,2	105,0	103,8	103,3	116,8	117,9	118,2	113,7	119,2	122,4	119,2	114,3
May	100,6	100,5	100,5	100,7	104,8	105,6	104,4	104,0	115,9	116,5	117,2	113,5	118,5	121,2	118,8	114,1
Jun	100,5	100,2	100,7	100,6	105,3	105,8	105,1	104,6	114,6	114,6	115,8	113,3	117,8	120,0	118,3	114,0
Jul	100,6	100,1	100,7	101,0	105,8	105,9	105,9	105,7	114,0	113,5	115,0	113,6	117,2	119,0	117,8	113,9

Consumer Price Index in the Republic of Kazakhstan (%)																
Period	To previous month				By December of the previous year				To the corresponding month of the previous year				To the corresponding period of the previous year			
	goods and services	goods		paid services	goods and services	goods		paid services	goods and services	goods		paid services	goods and services	goods		paid services
		food	non-food			food	non-food			food	non-food			food	non-food	
Aug	100,7	100,0	100,5	101,9	106,6	105,9	106,4	107,7	113,1	112,4	113,5	113,9	116,7	118,1	117,2	113,9
Sept	100,6	100,3	100,6	100,9	107,2	106,2	107,1	108,7	111,8	111,4	112,1	111,9	116,1	117,3	116,6	113,7
Oct	100,7	100,5	100,8	100,8	107,9	106,8	107,9	109,6	110,8	110,4	111,1	111,0	115,5	116,6	116,0	113,4
Nov	101,0	100,7	100,5	101,7	108,9	107,5	108,5	111,5	110,3	109,2	109,9	112,0	115,0	115,9	115,4	113,3
Dec	100,8	100,9	100,5	100,8	109,8	108,5	109,1	112,4	109,8	108,5	109,1	112,4	114,5	115,2	114,8	113,2
2024																
Jan	100,8	101,1	100,5	100,7	100,8	101,1	100,5	100,7	109,5	108,2	108,6	112,3	109,5	108,2	108,6	112,3
Feb	101,1	100,8	100,7	101,7	101,9	101,9	101,2	102,5	109,3	107,4	108,5	112,8	109,4	107,8	108,6	112,6
Mar	100,7	100,6	100,5	101,1	102,6	102,5	101,7	103,6	109,1	106,9	108,2	113,2	109,3	107,5	108,5	112,8
Apr	100,6	100,3	100,7	100,7	103,1	102,9	102,4	104,3	108,7	106,3	107,6	113,5	109,1	107,2	108,2	113,0
May	100,4	99,8	100,5	101,0	103,5	102,7	102,9	105,4	108,5	105,5	107,6	113,9	109,0	106,9	108,1	113,1
Jun	100,4	100,0	100,6	100,6	103,9	102,7	103,5	106,0	108,4	105,4	107,4	113,8	108,9	106,6	108,0	113,3

Monthly and Annual Changes

In January 2022, the CPI increased by 0.7% compared to the previous month and by 0.6% year-on-year. Throughout 2022, prices fluctuated, with a peak monthly increase of 3.7% in March. By December, monthly inflation had eased to 1.2%, but the year-on-year rate accelerated to 20.3%.

In 2023, the trend towards stabilization continued, with a 1.1% monthly increase in January and a slightly lower year-on-year inflation rate of 20.7%. While prices continued to rise throughout the year, the pace moderated, peaking at 0.9% in March.

By early 2024, inflation showed signs of further deceleration. January saw a modest 0.8% increase compared to December 2023, followed by a slight uptick to 1.1% in February. This suggests a potential cooling of inflationary pressures.

5.4.1.2 Labour market

Kazakhstan's socioeconomic framework is significantly influenced by the dynamics of employment, income distribution, and household expenditure patterns, particularly in relation to levels of poverty. According to recent statistics, in the Republic of Kazakhstan, 5.4% of the population has an income below the cost of living. In the Jambyl region, 5.6% of the population has an income below the cost of living (3% in urban areas and 7.6% in the rural areas) [19].

In 2023, Kazakhstan's labour market demonstrated resilience, with unemployment rates slightly decreasing to 4.7%. This was accompanied by a notable increase in the minimum wage, contributing to a reduction in poverty rates to 8.8%, based on a poverty line of \$6.85 per day. The workforce is primarily engaged in various economic sectors, with strong reliance on resource extraction, particularly oil. In recent years, the government has implemented policies aimed at enhancing employment opportunities, particularly among youth and women, to leverage the potential of the labour force.

Remaining challenges exist in the labour market, notably the need for skills development to address the requirements of a diversifying economy. There has been a shift toward increasing job creation in non-resource sectors, reflecting the government's ambition to promote economic diversification.

Income Levels

Income growth in Kazakhstan has varied across different sectors, with substantial income derived from the oil and gas industry. Despite challenges such as stagnant wages for some segments of the population, consumer confidence remained buoyant in 2023, evident in retail growth of 7% and new business registrations rising by 10%.

The positive trends in economic activities have supported gradual increases in income levels for many households, contributing to overall improved living standards.

However, disparities in income distribution persist, particularly between urban and rural areas. The government continues to address these inequalities through targeted social spending and initiatives to uplift economically disadvantaged communities.

Expenditure Patterns

Household expenditure patterns in Kazakhstan are influenced heavily by the cost of living, which has been affected by recent inflation rates. In February 2024, inflation slowed to 9.3%, a decrease from peaks of 21.3%, but still above the government's target. High food prices and utility costs remain significant concerns for households, with low-income families particularly vulnerable to rising expenses.

The government is focused on horizontal policies aimed at controlling inflation and reducing expenditure burdens on citizens while also ensuring that social services are adequately funded.

Anticipated improvements in economic conditions and easing inflation are expected to lead to a further decline in poverty rates, which could drop to 7.9% in 2024.

Local Labour Overview

The labour market data for Moiynkum District from 2014 to 2023⁵ reveals several trends in employment, workforce composition, and unemployment rates that provide insight into the economic dynamics of the Region.

Below is provided a detailed analysis.

Workforce and Employment Trends

Working Population

The economically active population has shown fluctuations over the years, starting at 18.3 thousand in 2014, reaching a peak of 19.5 thousand in 2020, and then declining to 15.9 thousand by 2023. This decline could indicate a significant outmigration or a decrease in economic opportunities available within the district, suggesting potential challenges in attracting or retaining a workforce.

Employed Population

The total employed population mirrors the trend observed in the working population. It began at 17.5 thousand in 2014, peaked at 18.6 thousand in 2019, and then dropped to 15.1 thousand in 2023. This consistent decrease in both the employed and working populations raises concerns about job availability and the overall health of the local economy.

Wage Earners

The number of wage employees started at 8.3 thousand in 2014, reached a high of 11.3 thousand in 2020, but fell to 8.6 thousand by 2023. This suggests a potential reduction in formal employment opportunities or shifts in the types of employment available, possibly toward more informal or temporary positions as economic conditions deteriorated.

Self-Employed Workers

In contrast to wage earners, the number of self-employed individuals showed a general downward trend, dropping from 9.2 thousand in 2014 to 6.5 thousand in 2023. This change could reflect a diminishing entrepreneurial environment, or challenges faced by local businesses, particularly in the agricultural and informal sectors.

Unemployment Rates

Overall Unemployment Rate

The unemployment rate has remained relatively stable over the years, fluctuating between 4.1% and 4.7%. This stability despite changes in the workforce indicates that while fewer people are employed, the rate of unemployment has not significantly increased, which may suggest that individuals are leaving the labour force without necessarily registering as unemployed.

Youth Unemployment Rate

The youth unemployment rate (ages 15-28) showed a significant decline from 6.9% in 2014 to a low of 0.3% in 2020, before rising again to 3.6% in 2023. This trend reflects improvements in youth employment opportunities in the earlier years and increasing challenges in recent times, potentially indicating that young people are facing barriers in entering the job market as the overall economic situation shifts.

Economically Inactive Population

The number of individuals not participating in the labour force has generally increased from 4.8 thousand in 2014 to 3.7 thousand in 2023, with fluctuations in between. Although this group has remained relatively stable, the slight increases suggest that more residents may feel discouraged from seeking employment, further contributing

⁵ [Dynamic tables - Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National statistics](#)

to the declining figures for the economically active population. The labour market data from Moiynkum District indicates a concerning trend of declining employment and working population over the nine-year period from 2014 to 2023. While the overall unemployment rate remains stable, the drop in both wage employment and self-employment, coupled with the increasing youth unemployment rate, suggests a need for targeted economic initiatives to revitalize the local economy and increase job opportunities.

5.4.1.3 Gross Domestic Product (GDP)

Kazakhstan's economic landscape has undergone significant transformation over the past few decades, particularly since the early 2000s, driven by market-oriented reforms, an abundance of mineral resources, and substantial foreign direct investment. As of 2023, the country has a population of 19.8 million and a GDP of approximately \$259.7 billion, with a GDP per capita of \$13,088.5. This remarkable growth has turned Kazakhstan into an upper middle-income economy, improving living standards and reducing poverty levels significantly.

5.4.2 Economy in the Region and the Project Area

5.4.2.1 Agriculture

Due to the chronic lack of water resources severely limiting agricultural activities, no crops are being grown next to the survey site in the region. The primary local activities have shifted to cattle grazing and fishing in Balkhash Lake; however, recent years have seen declining water levels, resulting in fewer fish being available for catch. While the cattle grazing landscape is still significant, with various rural districts contributing to livestock numbers - such as Ulanbel with 1,532 large cattle and 6,585 small cattle, and Shyganak, which has 903 small cattle - the overall livestock farming is challenged by environmental conditions. As water scarcity continues to affect both farming and fishing, the livelihoods of local residents who depend on these activities are increasingly at risk.

5.4.3 Industry

Moiynkum District is characterized by a developing industrial landscape, with a number of key sectors contributing to its economic growth. One notable enterprise in the region is the Myn-Aral Company, which began operations in 2014 and specializes in fish processing [5]. The factory has the capacity to process 1,500 tons of fish annually and produced 133.6 tons of fish products in 2021, down from 122 tons the previous year. To increase production, regional authorities have committed to assigning two additional sites at Lake Balkhash to the plant as part of efforts to boost fish production. Under the regional program for the development of the fishing industry, there are plans to increase the output of commercial fish to 3,000 tons by 2025, supported by the implementation of 18 investment projects.

The Region's industrial potential is underscored by the remarks of the local administration, which highlighted that industry is a leading sector of the district's economy. In the past year, industrial enterprises in the Jambyl Region produced goods valued at 859.8 billion tenge, with Moiynkum's enterprises contributing 94.8 billion tenge, marking the highest output among districts at 11 percent of the regional total. Currently, more than 2,000 residents are employed in various industrial jobs in the district.

Moiynkum District hosts several production facilities across different sectors, including the metallurgy industry represented by the Akbakai branch of AltynAlmas JSC, the construction sector with companies such as Orgstroy, and the mining industry with enterprises like Eastern Mining Management. Plans are underway to implement six new investment projects, which are expected to create over 850 new jobs, further bolstering the district's economic landscape. The regional government has expressed its commitment to supporting the business community, emphasizing the importance of such initiatives within the framework of the "Economy of Simple Things" program and the National Project for Business Development from 2021 to 2025. As stated in the President's address to the nation on September 1, 2022, the focus will remain on improving wages, productivity, and the social conditions of workers, ensuring that these issues stay at the forefront of economic development.

strategies in the region. Small areas along the northern boundaries are earmarked for granite extraction, specifically associated with **ORGSTROY LLP**.

5.4.3.1 Other economic activities

Mirny Village supports a small local economy with five shops that primarily source their products from the nearby city of Shu. This limited retail environment meets the essential needs of residents, but options may be somewhat constrained. Additionally, two entrepreneurs in the village are renting out their apartments as a small hotel, providing potential accommodations for visiting engineers and workers associated with the nearby Project site. One of these entrepreneurs is currently renovating their apartments to enhance the quality of lodging offered.

There is also a woman in the community who previously operated a canteen, which has since ceased operations due to a lack of demand. However, given the anticipated influx of workers for the Project, she has expressed willingness to revive the canteen, if possible, which could provide meals and refreshments for those coming to the Project site. This adaptability reflects the community's potential for growth and responsiveness to emerging opportunities, contributing to the overall economy Mirny.

5.4.3.2 Employment, income and expenditure

During the social survey conducted in Mirny Village, all respondents expressed concerns regarding unemployment, highlighting the challenges faced by the community in securing stable livelihoods. The primary employers in the area are the Akimat (local government) and Orgstroy, a construction company, which provide essential jobs for a limited number of residents. However, beyond these two major employers, many individuals in the village rely primarily on pensions as their main source of income. This heavy dependence on government assistance and the limited availability of job opportunities contribute to the prevailing sense of uncertainty regarding economic conditions in Mirny.

5.4.3.3 Foreign Trade

The Moiynkum district plays a modest role in Jambyl region's foreign trade, primarily focusing on exporting natural resources. Agricultural products, such as livestock and grains, are primarily significant in trade at the local level. Foreign imports primarily include machinery, technology, and consumer goods, which are vital for supporting the local natural resource companies and agricultural sector [32].

5.5 Education

5.5.1 Country Overview

Kazakhstan enjoys a high literacy rate, estimated at approximately 99.8% for adults, reflecting the government's commitment to education and its successful implementation of universal education policies. The educational framework in Kazakhstan is structured into several levels, including preschool education, general secondary education, technical and vocational education, and higher education:

- **Preschool Education** - Access to preschool education is considered crucial for early childhood development. The government has implemented various initiatives to expand access to kindergartens, including state-funded facilities where parents are only required to pay for meals provided at the canteen. This model aims to make early childhood education more affordable and accessible for families, ensuring that children receive essential preparation for their future schooling;
- **General Secondary Education** - Compulsory general secondary education in Kazakhstan lasts for 11 years, from grades 1 to 11. The government emphasizes the importance of a strong foundational education;
- **Technical and Vocational Education** - Recognizing the importance of skilled labour in the workforce, technical and vocational education institutions offer practical training to prepare students for various occupations after the 9th grade;

- **Higher Education** - According to the 2021 census, 3.7 million people in Kazakhstan held a higher education degree, while 4.1 million had completed secondary vocational education, and 4.9 million possessed a general secondary education. Compared to the 2009 census, the share of the population with higher education increased from 19.8% to 27.6% by 2021. Among the regions, Almaty Region has the highest number of residents with higher education, totalling 404,800 individuals, while Astana leads in the proportion of higher-educated citizens, with 25.5% of the capital's population holding university degrees. Kazakhstan also has a notable number of individuals with postgraduate degrees; as of the 2021 census, 120,800 citizens held advanced degrees, with a significant share (17.8%) in the age group of 30-34 years. Among those with postgraduate education, 78% have a master's degree (approximately 96,900 individuals), 3.6% hold a PhD of Philosophy (around 4,500 individuals), 13.5% are candidates of sciences (approximately 16,800 individuals), and 4% have doctoral degrees (about 4,900 individuals).

According to statistics from 2021, the total number of students in Kazakhstan is approximately 578,200, with women comprising 53.4% of the student population. In the current academic year, 163,500 students were admitted, of which 52.7% are women. Additionally, during the previous academic year, there were 71,500 new enrolments while 68,000 students left the system, and 162,000 students completed their studies.

When examining educational attainment by gender, the percentages of men and women with higher education are nearly equal. The proportion of men with higher education rose from 17.8% to 27.9%, while that of women increased from 21.6% to 27.3%. Overall, there are 276 individuals with higher education credentials for every 1,000 people in the population, a significant increase from 198 individuals in 2009.

According to statistics report from December 15th 2022, the total number of university students in Kazakhstan is approximately 578,200, with women comprising 53.4% of the student population. In the 2022 academic year 163,500 students were admitted, of which 52.7% are women. Additionally, during the previous academic year, there were 71,500 new enrolments while 68,000 students left the system, and 162,000 students completed their studies.

5.5.2 Education in the Project Area

The education system in Mirny Village is limited, particularly regarding higher educational opportunities. Local residents must travel to Taraz, where four universities offer degree programs, namely Taraz State Pedagogical Institute, Taraz State University M.H.Dulati, Jambyl Hydromelioration and Construction Institute and Jambyl of Humanities and Technique.. In Mirny itself, the educational facilities consist of just one school, which serves the primary and secondary education needs of the community, as well as a kindergarten for early childhood development. During the social survey conducted in Mirny Village, it was found that most respondents, except for one individual, possessed secondary vocational education. Community health, safety and security

5.5.3 Country Overview

Public health in Kazakhstan is shaped by a complex interplay of social, biological, environmental, and medical factors impacting the population.

As of January 1, 2024, Kazakhstan's population reached 20,033,546 people, with 12,451,004 residing in urban areas (an increase of 1.9%) and 7,582,542 in rural areas (a growth of 0.3%). Over the past 12 months, the total population increase amounted to 266,739 individuals, with 257,300 attributed to natural growth and 9,344 from migration. During this year, 387,900 children were born in Kazakhstan (compared to 403,500 in 2022), with 200,300 boys and 187,600 girls, resulting in a birth rate of 19.50 per 1,000 population. The number of deaths over the same period was 130,600, yielding a mortality rate of 6.56 per 1,000 individuals.

The highest birth rates were observed in the Mangystau Region (26.78 per 1,000 population), Turkistan Region (26.11), and the city of Shymkent (25.68). Furthermore, a total of 3,215 infants died before reaching one year of age, with the infant mortality rate decreasing to 7.69 per 1,000 live births, down from 7.97 in 2022.

Kazakhstan's healthcare system is characterized by its commitment to providing free medical services, a principle enshrined in the country's policies aimed at ensuring universal health coverage for all citizens. The introduction of Mandatory Social Health Insurance MSHI in January 2020 has further enhanced this framework by establishing a structured mechanism for funding and delivering health services. Under the MSHI, citizens contribute to a collective insurance fund that aims to cover a wide range of medical needs, ensuring that individuals have access to necessary healthcare without direct costs at the point of service [21].

As of 2023, more than 78,000 doctors and approximately 180,000 specialists in the medical field are actively working to serve the population. Over the course of 11 months in 2023, healthcare facilities provided assistance to about 3 million patients in hospitals, while the primary healthcare network received more than 90 million visits. Notably, the country welcomed over 360,000 newborns in the same year. The commitment to improving health outcomes is also reflected in reduced mortality rates, with significant decreases in deaths from various causes, including a reduction of 22.1% in tuberculosis-related deaths compared to the previous year.

5.5.4 Health, Safety and Security at Regional level

As of the first half of 2024, Jambyl Region has seen notable improvements in various health indicators, as reported during a recent meeting led by the head of the health department, Janar Ospanova. The expected lifespan in the region has increased by 6.1 years, reaching 75.25 years in 2023, up from 69.15 years in 2021. However, despite this progress, the region faces ongoing health challenges, with the birth rate slightly decreasing to 20.14 per 1,000 residents compared to 20.94 in 2023. The natural population growth rate has also declined to 14.04 per 1,000 residents, alongside an increase in the mortality rate to 6.10, up from 5.72 in the previous year.

Health issues related to the cardiovascular system remain a concern, as the incidence of diseases in this category has increased by 1%, rising from 1160.9 in 2023 to 1172.6 in 2024. Despite this, mortality rates from cardiovascular diseases have decreased by 4.5%, standing at 50.6 per 1,000 residents compared to 53.0 in 2023.

Tuberculosis rates have also shown improvement, with a 5.2% reduction in incidence, dropping to 18.0 cases in 2024, down from 19.0 in 2023. The mortality rate from tuberculosis has decreased by 16.6%, now at 0.5 deaths per 1,000 residents from 0.6 in the previous year.

In terms of infectious diseases, the overall incidence has increased by 10% compared to the same timeframe in 2023, attributed to higher cases of acute respiratory viral infections during the 2023-2024 epidemic season [9]. Additionally, data from 2021 indicated that there were no confirmed cases of Crimean-Congo haemorrhagic fever registered in the Republic of Kazakhstan as of April 20, 2021. At that time, 81 victims of tick bites sought medical help in the Jambyl region, and all were placed under medical observation for 14 days, with no cases of Crimean-Congo haemorrhagic fever or other particularly dangerous infections reported among them. Tick bites were recorded across all districts, with varying numbers ranging from 1 case in the Talas district to 40 cases in the city of Taraz, except in the T. Ryskulovsky district.

While three individuals were hospitalized with a presumptive diagnosis of Crimean-Congo haemorrhagic fever in Taraz, Moiynkum, and Jambyl districts, laboratory tests did not confirm these diagnoses. Despite the absence of confirmed cases, there is a recognized risk of infection with the Crimean-Congo haemorrhagic fever virus, with infections identified in the Moiynkum, Sarysu, and Talas districts in previous reports. To mitigate this risk, all medical institutions in the region are prepared to provide care, and training has been conducted for 1,621 medical workers regarding the diagnosis, treatment, and prevention measures for Crimean-Congo haemorrhagic fever. In 33 settlements known to be endemic for Crimean-Congo haemorrhagic fever, anti-tick treatments and sanitary education initiatives are actively being implemented to protect the population.

5.5.5 Health Services in the Project Area

Public health services in Mirny Village are limited but essential for the well-being of the residents. The village has two doctors and one paramedic available to provide basic healthcare. Additionally, there is one ambulance that

serves the community, ensuring that emergencies can be addressed promptly. However, in the case of serious emergencies or more complex medical needs, residents are transported to the Moiynkum hospital for advanced medical care.

5.6 Mobility and infrastructures in the Project Area

5.6.1 Housing

The villages Mirny and Kiyakty are characterized by a significant number of abandoned multi-story buildings, which stand as a stark reminder of better days. Many of these structures have become largely vacant, with often only two families occupying an entire building. In areas featuring single-family households, the situation is similarly bleak; for instance, on a street with 20 houses, it is common to find that only four houses are currently inhabited. Compounding this issue, residents face the challenge of being unable to sell their homes due to a lack of demand, resulting from the ongoing decline in population and the overall economic situation. This desolation not only reflects the declining population and migration of residents in search of better opportunities but also instability in the community.

5.6.2 Water Supply Network

Access to water has become a significant challenge for the residents. Every person interviewed during the social survey highlighted the lack of water as a major problem. Water is delivered to the village by truck from Khantau, providing only 300 liters per household, and this service occurs just 2-3 times a month. Residents often find themselves having to call and plead for additional deliveries when their water supply runs out, as they rely on this water for drinking. Each liter costs 1 KZT, and there is also a water pipeline connected to Balkhash that opens twice a day—from 8 to 9 in the morning and from 4 to 5 in the evening. However, residents express mistrust toward this supply, stating that the water often comes out rusty and smells bad, making it undrinkable. One local herder near the potential wind farm site remarked that the well runs as deep as 150 meters, as water found at shallower depths is salty and unsuitable for drinking.

The article from InBusiness, published on August 25, 2023, addresses the critical water crisis faced by the residents of Shyganak Village, located just 2 km from Lake Balkhash. Despite this proximity to a water source, the villagers have been without access to drinking water for 20 years. The only water available in their homes is technical water sourced from the lake, which locals have grown accustomed to over the years, resorting to using it for consumption due to a lack of alternatives. However, the taste of this water makes it almost undrinkable, contributing to a range of health issues, as highlighted by local medical professionals.

A narrow pipeline has been laid from Balkhash to the village, supposedly supplying water to over 400 homes. Unfortunately, the pressure in the system is insufficient, leading to a situation where water merely drips from the taps rather than flows freely. This chronic water scarcity severely hampers daily life for residents, preventing them from maintaining proper hygiene or cleanliness in their homes.

5.6.3 Energy Supply Network

All the villages included in the survey area have access to electricity, despite Southern Kazakhstan is facing a significant energy deficiency that has raised concerns about the reliability of power supplies in the region. According to recent reports by Forbes, the increasing demand for electricity, driven by both population growth and industrial activities, has outpaced the existing energy infrastructure [20]. This situation has resulted in power shortages, particularly during peak demand periods.

The energy deficiency is compounded by a reliance on aging infrastructure and insufficient investment in the energy sector. Many power plants in the south are operating at or near capacity, which cannot effectively meet the growing needs of residents and businesses. Additionally, the reliance on fossil fuels, coupled with limited alternative energy sources such as renewables, puts further strain on the energy supply.

Local authorities and energy officials have emphasized the need for immediate action to address this growing crisis. Plans to enhance energy production capabilities, including investments in new power generation facilities and improvements to the existing grid, are critical for ensuring a stable energy supply. However, implementing these projects requires substantial financial resources and effective coordination between government bodies, investors, and utility companies.

As the situation unfolds, residents and businesses are increasingly concerned about the implications of energy shortages, which can lead to not only inconvenience but also significant economic consequences.

5.6.4 Basic Sanitation

The lack of access to clean drinking water in Shyganak, Mirnyi and Kiykhty villages has profound implications for basic sanitation, creating significant challenges for the health and well-being of its residents. With no reliable water supply available, homes are unable to accommodate modern sanitary facilities such as flushing toilets or wastewater treatment systems. This absence of essential infrastructure leads to a reliance on rudimentary sanitation methods.

Residents are forced to use street toilets with dug-out holes, which are basic in nature and lack the hygiene standards necessary for proper waste management. These makeshift facilities do not provide adequate privacy, security, or sanitation.

The reliance on such unsatisfactory sanitation practices not only raises immediate public health concerns but also contributes to a cycle of vulnerability among the population. The lack of sanitary amenities exacerbates issues related to dignity, comfort, and hygiene.

5.6.5 Mobility and Transport

In Kazakhstan, the level of mobility for people with disabilities is improving due to national programs such as the National Plan for Ensuring the Rights and Improving the Quality of Life of Persons with Disabilities until 2025 and the "Kedergisiz Keleshek" (Barrier-Free Future) project, aimed at adapting public infrastructure. The main challenges include insufficient adaptation of public facilities and social barriers that require increased awareness. The development of rehabilitation centers and the use of an interactive accessibility map play an important role in creating a barrier-free environment [24, 25].

Meanwhile, upon inspecting the villages near the project site, particularly Mirny and Kiyakty, it is evident that the overall abandonment and degraded infrastructure reveal a complete lack of provisions for individuals with limited mobility.

Concerning transportation, Kazakhstan's valuable location as a connector between China, Europe, and the Middle East has been mostly underused in the past because of poor transport links. However, in most recent years, the Kazakh Government has advanced sustainable economic growth by enhancing regional integration and improving connectivity, with the creation of modern road corridors which have significantly improved imports and exports connections⁶.

To date, the length of the highways of the Republic of Kazakhstan is 128,300 km, in which 23,500 km are the republican roads. The republican road network includes six international corridors with a total length of approximately 8,250 km. These serve mainly as international transit routes between China, Kyrgyzstan, Uzbekistan, Turkmenistan and Russia, and onwards to Europe. They form part of international agreements under Asian Highways, Transport Corridor Europe Caucasus-Asia (TRACECA), and Central Asia Regional Economic

⁶ [How New Roads in Kazakhstan Create Jobs, Save Lives, and Boost Trade](#)

Cooperation (CAREC), amongst others. Figure 9 shows the main republican roads in Kazakhstan, which includes the international corridors and the Nuryl Zhol focus roads.



Figure 9: Kazakhstan main republican roads.

Transportation options in Mirny Village are limited, which poses challenges for residents seeking access to larger towns and cities. The village is served by a single "Sputnik" train cart that travels to Shu, making stops at Mynaral, Shyganak, Mirny, and Khantau along the way. The fare for this journey is 900 tenge, providing an affordable, although infrequent, means of travel for those who rely on this public transport option.

In addition to the train cart, residents have the option of using private vehicles for transportation. Traveling by car typically costs around 20,000 tenge for the round trip, making it a more expensive option. For those sharing a ride, the cost is approximately 4,000 tenge per person for a back-and-forth journey. While private vehicles offer greater flexibility in terms of travel times, the high cost can be a barrier for many residents, particularly in a community already facing economic difficulties. Overall, the transportation options available to the residents of Mirny Village are limited and carry various challenges, impacting their ability to access services and opportunities beyond their immediate surroundings.

Concerning roads infrastructures in the Project area, it can be noted in the map below that there are two main roads serving the area.



Figure 10: Map of existing roads in the Project surroundings.

The two main roads serving the Project area are the following:

- **KN-27 "Mirny–Akbakay" road.** The KN-27 "Mirny–Akbakay" is a 110 km, two-lane paved roadway built to service the plant. Current traffic volumes are low and consist mainly of heavy goods vehicles and specialized equipment. The road segment runs along the western side of the project site. The asphalt pavement is generally in satisfactory condition.
- **A-358 "Burybaital – Merke" highway.** The A-358 "Burybaital – Merke" highway, 262 km in length, is one of the branches of the M-36 route Astana — Karaganda — Balkhash — Almaty, connecting the centre of the country with the southern regions. The road includes 6 bridges, 3 overpasses across the railway, 11 illuminated interchanges, 276 culverts, rest areas, and bus pavilions. The section of road from the city of Shu to the settlement of Burylbaital, 176 km in length, is of the second technical category with two lanes. The road was last repaired in 2024, and the asphalt pavement is in good condition. The road runs 20 km south of the project site and crosses the planned OHTL to the Shu substation.

Beside the main roads, other two smaller roads can be found connecting the Project area with the villages of Sholpan and Kiyakhty.

5.7 Human Rights

Human rights in Mirny Village are deeply intertwined with the socio-economic challenges that its residents face. While Kazakhstan has made progress in the recognition of human rights since gaining independence, there remain significant hurdles at the local level that impede the full realization of these rights for the village's inhabitants.

One of the most pressing human rights concerns in Mirny is access to clean drinking water. The community has struggled for years with water scarcity, forcing residents to rely on limited and often poor-quality water sources. This lack of access to clean water violates basic human rights related to health and well-being, as it affects the residents' ability to lead healthy lives. The absence of reliable water supply not only impacts daily activities such as cooking and cleaning but also contributes to broader public health issues in the village.

Economic opportunities in Mirny are also constrained, with many residents reliant on limited employment options, primarily connected to the local akimat and a few enterprises. The predominant reliance on government jobs stifles the diversity of economic engagement in the community, leaving individuals with little room for entrepreneurial initiatives or career advancement. This economic dependency can lead to increased vulnerability, where residents may feel pressured to avoid expressing dissent or dissatisfaction with the status quo, further impeding their rights to free speech and economic freedom.

In the context of Kazakhstan's political landscape, where freedom of expression and political dissent can be met with scrutiny, residents of Mirny may hesitate to discuss their political preferences or grievances openly. The political climate can create an environment of fear, where individuals might shy away from voicing concerns about local governance, policy decisions, or socio-economic challenges. This reluctance to engage in public discourse undermines the fundamental human right to free expression, a crucial aspect of democratic participation.

The limited presence of essential services such as healthcare and education exacerbates the challenges faced by residents when it comes to exercising their rights. With inadequate medical facilities and resources, the health of the population is at risk, impacting their right to health care. Furthermore, educational opportunities are restricted, which hampers the potential for personal and community development. The accessibility of quality education is fundamental to empowering individuals to contribute meaningfully to society and uphold their rights.

5.8 Civil Society and NGOs

In the Jambyl region, a diverse array of public organizations operates, each with distinct missions and goals. For instance, the Jambyl Business Women's Association is dedicated to enhancing women's status by advocating for their rights and increasing their participation in the regional economy. This organization actively supports female entrepreneurship and aids in the execution of business projects led by women [26].

Organizations such as "Zhandanu", "Rights and Opportunities for the Disabled" and "Nakty Komek" are vital in assisting individuals with disabilities, focusing on their integration into society and ensuring access to essential services. These groups play a crucial role in supporting those with limited mobility, helping them navigate daily challenges and advocating for their rights [27].

The Region also hosts several ethnocultural associations that are instrumental in preserving and promoting the cultural heritage of various ethnic groups. These organizations, including the "Assembly of the People of Kazakhstan in the Jambyl Region" contribute significantly to fostering interethnic harmony by organizing cultural events, festivals, and educational programs that celebrate diversity and facilitate intercultural dialogue [30].

Youth organizations such as the "Ak Zhelken" Youth League and the "Zhangyru Zholy" Republican Youth Movement are deeply involved in the social fabric of the region. Under the auspices of the Assembly of the People of Kazakhstan, these groups work to develop leadership skills in young people, promote interethnic unity, and engage youth in social and environmental initiatives. Their activities include organizing community clean-ups, educational events, and forums, all aimed at nurturing civic responsibility and active participation among the younger generation [28, 29].

The "Taza Kazakhstan" environmental campaign in the Jambyl region is a significant initiative aimed at improving the local ecological situation. This campaign brings together public organizations, government bodies, and volunteers to undertake large-scale activities, such as cleaning public spaces, planting trees, and promoting environmentally responsible practices. Regular community clean-ups, ecological lessons, and educational programs are part of this campaign, enhancing public awareness and encouraging residents to actively participate in solving environmental issues [31].

5.9 Cultural heritage

5.9.1 Tangible cultural heritage

The proposed wind farm project site, including the OHTL route and access roads, has been assessed and found to be situated within a region rich in historical significance and cultural landmarks. Moyinkum District is home to several prominent sites, including the **Ayzhigit-Kalpe Mausoleum**, the **Kuralai Sulu Mausoleum**, and the **Binazar Batyr Mausoleum**, which reflect the rich heritage and traditions of the Kazakh people. For instance, these mausoleums serve as important symbols of cultural identity and spiritual reverence, showcasing traditional architectural styles and the historical narratives that shape this area's identity.

In proximity to the Project site, the **Khantau Mountains** are noteworthy for their ancient rock art and archaeological features, including approximately 1,000 petroglyphs, burial structures, and evidence of early settlements. These features indicate a long-standing human presence in the region, with significant cultural and historical implications.

Moiynkum District, located in the Jambyl Region of Kazakhstan, is home to several significant historical and cultural landmarks that reflect the rich heritage and traditions of the Kazakh people. Among the prominent sites are the Ayzhigit-Kalpe Mausoleum, the Kuralai Sulu Mausoleum, and the Binazar Batyr Mausoleum, each with its unique history and cultural importance [15].

The Ayzhigit-Kalpe Mausoleum is an architectural monument located in Moiynkum District, built in 1902 by master Кемпирбай over the burial site of the revered holy figure Ayzhigit-Kalpe. Situated 30 km north of the village of Kumozek, this mausoleum is constructed from raw brick and features a two-chamber structure topped with high conical domes. It includes fenced areas on the northeastern and northwestern sides. The smaller chamber connects to the larger one, which has a window opening leading to the last enclosure. The northwestern fence stands independently and contains a burial site. This mausoleum is a significant cultural symbol, reflecting the traditional reverence for spiritual figures in Kazakh society.

The Kuralai Sulu Mausoleum, dating back to the 18th and 19th centuries, is situated near the river close to the aul of Kishi Kamkaly in Moiynkum District. This site is particularly noteworthy as it commemorates Kuralai Sulu, a heroine from Kazakh legends renowned for her beauty and bravery. According to local lore, Kuralai's short life was marked by a tragic love story involving the capture of a young Kazakh boy, Kelden, by Kalmyk invaders. Following her efforts to rescue him, a tragic encounter with a tiger led to her untimely death. In her honor, Kelden built a mausoleum over her grave, signifying the deep connection between cultural narratives and the region's identity.

Kazakh poet Isa Baizakov famously captured the essence of Kuralai Sulu's legend in his poem, highlighting themes of kindness amidst the backdrop of historical conflict between Kazakhs and Kalmyks.

The Binazar Batyr Mausoleum was constructed between 1993 and 1994 to mark the 190th anniversary of the legendary hero Binazar Akediluly. He earned his title as a batyr during battles against the Kokand khans and played a crucial role in promoting sedentary farming practices among his people in the Shu River valley. The water canal established during his time continues to irrigate the region's lands and is known as the Binazar Canal. This mausoleum, built of fired brick and topped with a spherical dome, serves as a testament to Binazar's legacy, emphasizing his contributions to peaceful agricultural settlement and community development. Located in the foothills of Khantau, the mausoleum stands 30 km northeast of Khantau aul and includes a hotel for visitors, highlighting its significance as both a cultural and tourist site in the region.

Petroglyphs of Khantau. The Khantau Mountains are a significant site for ancient rock art from the Bronze Age, featuring around 1,000 petroglyphs. These engravings include scenes of horses, bulls, camels, and chariots, all dating back to the Bronze Age, with most petroglyphs estimated to be from the 3rd to 1st millennium BCE. During this period, the region had a more humid and temperate climate, characterized by full-flowing rivers, groves along the riverbanks, and abundant pastures. Historically, the Khantau Mountains were a crucial meeting point for trade caravans. The area also preserves evidence of ancient settlements, burial sites, and tumuli. Approximately 150 burial structures have been identified, consisting of stone cists within rectangular or circular enclosures. Excavations of these graves have uncovered pottery fragments and bronze ornaments, such as bracelets, pendants, and beads. These burial structures are dated to the 13th century BCE [34, 35].



Figure 11: Petroglyphs of Khantau.

The Shu-Ili Low Hill Terrain are also known for being the site of the great Anrakai Battle between the Kazakhs and the Dzungars in 1730. Along the Kopa River at the top of the Kulzhabasy Ridge, there are many tall stone piles, up to 2 m in height. These stone formations are believed to be remnants from the Dzungar invasion, possibly used by the Kazakhs to create the illusion of a larger military force to deter invaders [34].



Figure 12: Tall stone piles at the top of Kulzhabasy Ridge.

Comparable rock carvings in this region have been identified in the well-known complexes of the Shu-Ili Mountains, Kyndyktas, Kulzhabasy, Serektas, and Anrakai, which, along with the Khantau Mountains, constitute a continuous system of steppe mountains in the Shu-Ili interfluvium. Given the proximity of the Maizharylgan and Jambyl Mountains, where the Project area is located, to the Khantau and other mountain ranges, there is a strong likelihood of uncovering similar archaeological artifacts at the Project site. Furthermore, archaeological studies indicate that this area is characterized by various ancient burial sites and mounds [35].

A comprehensive archaeological survey conducted on May 2024 on the Project site (*Archaeological Expertise No. AES-455 dated 23/05/2024*) recorded a total of 214 archaeological heritage objects. These objects are predominantly ancient archaeological remains scattered across the Project site and include burial mounds and rock art dating from the Bronze Age through the medieval period. Table 5.9-1 below summarizes the types of identified Historical and Cultural Heritage (HCH) objects, their approximate counts, locations and descriptions.

Table 6: Summary of Cultural Heritage Objects Identified in the Project Site.

Type of Heritage Object	Count	Period/Description	Approximate Location (WGS84)
Burial mounds (single kurgans)	~78	Earthen/stone tumuli on elevated ground, typically ~5–10 m diameter and 0.3–0.8 m high. Date to Bronze or Early Iron Age (some possibly Medieval).	44°29'30.76"N, 73°36'39.26"E (solitary mound on a ridge)
Burial mound clusters	13	Groups of 2–5 kurgans in proximity (collectively forming a necropolis).	44°29'51.63"N, 73°34'10.53"E

Type of Heritage Object	Count	Period/Description	Approximate Location (WGS84)
		Similar size/appearance as single kurgans.	(two adjacent mounds on a hilltop)
Petroglyph sites (rock art)	59	Engravings on rock outcrops depicting animals and hunting scenes. Medium patina suggests Bronze to Early Iron Age origin.	44°28'58.52"N, 73°35'57.25"E (rock panel with carved ibex and hunters)
Petroglyph localities (clusters of rock art)	34	Areas with multiple petroglyph-bearing boulders or cliffs in close vicinity. Often associated with above entries.	44°32'12.56"N, 73°30'30.38"E (several engraved figures on a rock face)
Archaeological complexes	27	Multi-component sites (e.g. a cluster of kurgans and petroglyphs together). Indicate culturally rich activity areas.	44°31'13.89"N, 73°34'31.58"E (cluster of mounds with nearby rock art)
Historic grave markers	3	Isolated grave sites from recent history (likely 19th–20th century). Marked by stone or concrete headstones.	Coordinates not available (outside immediate turbine locations)

The above heritage sites were documented during an archaeological field survey carried out in April–May 2024 by a licensed expedition team. The survey combined desktop research, including analysis of satellite imagery and archival maps, with systematic pedestrian fieldwalking across the proposed Project site. As a result, 214 objects of historical and cultural heritage, mainly archaeological monuments, were identified and mapped within the Project site boundaries. These consist predominantly of mid-sized earthen and stone kurgans, burial mounds, located on dominant ridge lines and hillocks and clusters thereof, as well as numerous rock art, petroglyph, located on sandstone outcrops in the area.

No ancient settlements or standing architectural remains were found; the cultural heritage present in the area is entirely comprised of buried archaeological features and rock engravings. The artifacts and features suggest intensive human presence in this region during the Bronze and Early Iron Ages (e.g. nomadic burials and ritual sites), with continued use into the medieval period. All recorded sites have been preliminarily classified as “local significance” heritage sites under Kazakh law, therefore not formally designated national monuments, but still protected under the Kazakh law.

All identified sites have been entered into the local heritage register (preliminary list) as required by law, which means they must be treated as protected heritage until their final status is determined. The conclusion of the survey did not deem any of the findings to be of “national” significance (i.e. no flagship site warranting removal or extensive excavation), but conditions need to be considered to safeguard all recorded objects in situ. Based on Kazakh national regulations, construction in the area is allowed only on the condition that the historical-cultural monuments are preserved and that all construction activities adhere to mandated protection measures.

5.9.2 Intangible cultural heritage

Kazakh nomadic culture, deeply rooted in the traditions of pastoralism and mobility, has been shaped by centuries of living in harmony with the vast steppes of Central Asia. This culture is characterized by its emphasis on community, resilience, and adaptability, traditionally organized around seasonal migrations in search of grazing lands for livestock. Central to this way of life is the practice of Islam, which has had a significant influence on the social structures, values, and beliefs of the Kazakh people.

In the context of the proposed wind farm project, the area around windfarm serves as a reservoir of intangible cultural heritage (ICH). This includes the traditional lifestyles, oral histories, customs, and practices that have

been passed down through generations. The village elders play a vital role in this cultural landscape, as they are often the custodians of local knowledge and traditions, making important decisions that reflect the community's values and needs. Their guidance helps to preserve the essence of the community's identity and ensures that the voices of the residents are heard in the face of any developments that may affect their way of life.

Recognizing the presence of such intangible cultural heritage is crucial when considering the potential impacts of the project. The unique social fabric, the collective memory, and the established customs surrounding pastoralism and community living hold significant importance to the local population. The involvement of village elders in decision-making processes ensures that the historical and cultural context is respected and integrated into discussions around the project. Therefore, it is essential to engage with these community leaders and consider their insights and traditions during the planning and implementation phases of the project to safeguard the rich intangible heritage of the area.

5.10 Landscape and Visual Quality

5.10.1 Landscape Units

Moiynkum District features a diverse landscape characterized by varying soil types and topographical elements. The southern and western regions of the district are characterized by low hills and ridges, surrounded by sandy mounds and unique geological formations. In contrast, the northeastern part of the district borders Balkhash Lake, where the shoreline of the Shu-ili Low Hill Terrain attracts significant land features, providing a brilliant contrast against the surrounding terrain. This area, part of the Kyrgyz Alatau, rises to an elevation of 1,800 meters above sea level, while the Khantau ridge reaches 1,053 meters from the Ai-Tau peak. The Jiek mountain range starts several decades back, extending through Zailinsky Mountain and Jambyl Mountain, which is 947 meters high, before merging with mountains of Koyzharylgan, Maizharylgan, Baigary, and Shagyrly.

The Project area is predominantly located on the flat-topped Maizharylgan Mountains, with its northern section extending onto the Jambyl Mountain. To the west of the Project area are the Sekseul Dala Steppes, which have an average elevation of around 345 meters. Between the Sekseul Dala Steppes and the Maizharylgan Mountains, there is a significant elevation rise in the Maizharylgan mountains. Maizharylgan mountains reaching heights from 450 to 550 meters. Toward the east, the terrain gradually slopes downward into the Kulanketpes Valley and extends toward the shores of Lake Balkhash.

The vegetation reflects the dry climatic conditions of the region. Dominant plant species include various types of wormwood, camel thorn, marsh grasses, reeds, and shrubs, which thrive across the landscape.

Despite its natural beauty and ecological significance, the landscape of Moiynkum District is notably fragile. The region's ecosystem is sensitive to various anthropogenic pressures, including climate change, overgrazing, and unsustainable agricultural practices. The delicate balance of plant species and their habitats can be easily disrupted, leading to soil degradation and desertification. Moreover, water scarcity issues complicate the landscape's sustainability, threatening both the natural vegetation and agricultural activities that depend on reliable water resources.

5.11 Ecosystem services

5.11.1 Use of natural resources

Natural resources in the Moiynkum district, such as phosphorites and rare metals, are key to its economy. These resources are extensively mined and exported. The plots designated for natural resource exploration and extraction include:

- Black Metals;
- Colored Metals;
- Rare and Rare Earth Metals;

- Fluorspar and Associated Components;
- Manganese Ores and Gold; and
- Baryte, Feldspar, and Manganese Ore and Associated Components.

5.12 Facilities and public services in the survey area

5.12.1 Civil protection and firefighters

Civil protection and firefighting services are crucial for ensuring safety in Moiynkum District. The Department of Emergency Situations oversees disaster response efforts, while dedicated firefighting brigades in Birlik and Shyganak are ready to tackle fire emergencies. In cases of major fires, the Moiynkum Institution for the Protection of Forests and Wildlife coordinates with regional authorities to manage and control the situation effectively. Given the large distances between the villages and the potential wind farm site, it is important to take this geographical factor into consideration while preparing the emergency response plan to ensure timely and effective action during emergencies [18].

5.12.2 Emigration and Foreign Service

Nearest Migration Service Center is located in Taraz, administrative center of Jambyl region.

5.12.3 Culture

Mirny Village is equipped with a community center designed to serve as a focal point for local activities and gatherings. However, despite the presence of this facility, there appears to be a noticeable lack of activities taking place.

5.12.4 Police command

The Moiynkum District is supported by a dedicated police department that focuses on maintaining law and order within the area. In addition to the main police department, there is a Village Police department in Shyganak, consisting of eight officers tasked with ensuring community safety and addressing local concerns. The policing efforts are complemented by a police station located in Birlik, which serves as an additional resource for residents. Recently, Shyganak reported only one case of burglary, attributed to an outsider, indicating that crime levels are relatively low in the area.

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