REPORT

Mirny (Kazakhstan) 1GW Wind Farm Project

ESIA Report Chapter 10 - Cumulative Impacts Assessment

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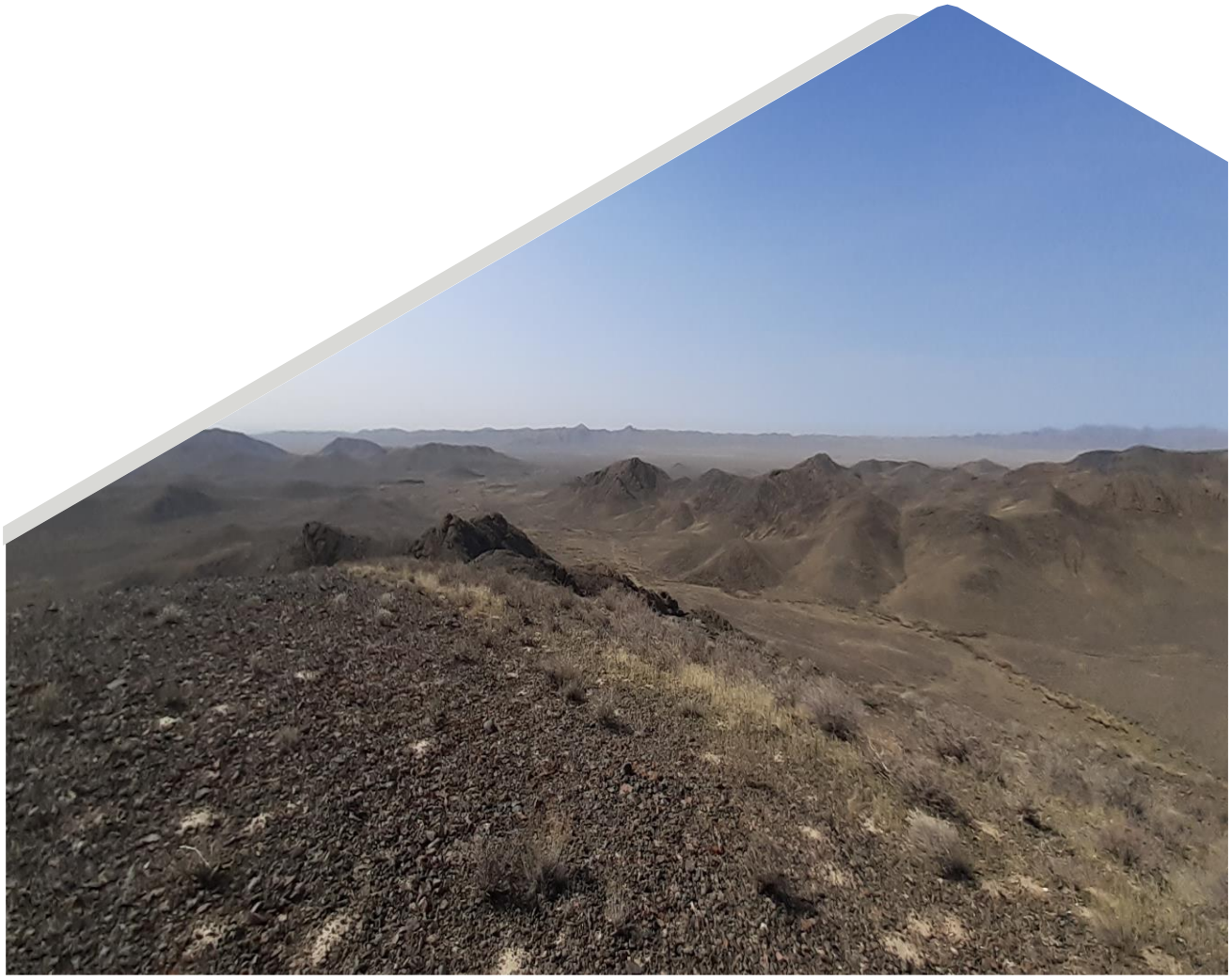

Distribution List

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10.0 CUMULATIVE IMPACT ASSESSMENT

10.1 Introduction

This section describes the potential for cumulative effects or impacts (impacts acting in conjunction with each other on a common receptor or resource) associated with the Project and other projects, either ongoing, planned or reasonably foreseeable within or near to it.

Consideration of cumulative effects is required as part of the IFC and EBRD policies:

- IFC PS 1 (IFC, 2012) requires the identification of cumulative impacts in the context of the project's area of influence as those *"that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted*". It is also specified that "*cumulative impacts are limited to those impacts generally recognized as important on the basis of scientific* concerns and/or concerns from Affected Communities", in the related Guidance Note ("GN") 1;
- EBRD PR 1 (EBRD, 2019) requires that "*The environmental and social assessment process (will) also identify and characterise, to the extent appropriate, cumulative risks and impacts of the project in combination with risks and impacts from other relevant past, present and reasonably foreseeable developments as well as unplanned but predictable activities enabled by the project that may occur later or at a different location*". The approach to assessing this for any project will vary depending on project context, the types of risk and issue, and the availability of data. However, the policy requires to demonstrate that all "reasonably foreseeable" and "unplanned but predictable" activities have been determined and considered.

For the Kazakh law the principal regulatory frameworks that lay down Environmental Impact Assessment (EIA) barely require a CIA. EIA is conducted in accordance with the requirements of the Environmental Code of the Republic of Kazakhstan and the Instructions for Organizing and Conducting an Environmental Assessment (No. 280, dated July 30, 2021). This law makes no distinction between cumulative or other impacts but prescribes an EIA to consider the totality of impacts (direct or indirect) on a receiving environment or on other region. Indeed, EIA practitioners have interpreted this law to include cumulative impacts as well.

10.2 CIA guidelines

IFC PS1 "Assessment and Management of Environmental and Social Risks and Impacts" recognises that, in some instances, developers need to consider cumulative impacts in their environmental and social impact and risk identification and management process.

PS1 states that the impact and risk identification process:

"…will take into account the findings and conclusions of related and applicable plans, studies, or assessments prepared by relevant government authorities or other parties that are directly related to the project and its area of influence" including, "master economic development plans, country or regional plans, feasibility studies, alternatives analyses, and cumulative, regional, sectoral, or strategic environmental assessments where relevant".

Furthermore, it highlights that "*The client can take these into account by focusing on the project's incremental contribution to selected impacts generally recognised as important on the basis of scientific concern or concerns from the Affected Communities within the area addressed by these larger scope regional studies or cumulative assessments*".

Central to the IFC approach is the concept of **Valued Environmental and social Components (VECs)**. To provide guidance on undertaking a CIA, IFC released a guidance note in August 2013 titled "*Cumulative Impact*

Assessment and Management – Guidance for the Private Sector in Emerging Markets"[1] (hereinafter referred to as IFC Good Practice Handbook). This guidance uses the concept of VECs, these being environmental and social attributes that are considered to be important in assessing risk, which can include for instance (see IFC Good Practice Handbook, Box 3):

- physical features, habitats and wildlife populations;
- ecosystem services;
- natural processes (e.g. water and nutrient cycles, microclimate);
- social conditions (health, economics); and
- cultural aspects (e.g., traditional spiritual ceremonies).

While VECs may be directly or indirectly affected by a specific development, they often are also affected by the cumulative effects of several developments.

10.2.1 CIA Methodology

The CIA methodology adopted has been defined taking into account the **six-step process** as detailed in the IFC Good Practice Handbook (Figure 1), and has comprised the following:

- **Step 1 - Scoping Phase I**: this has entailed defining which VECs need to be included within the CIA taking into account the characteristics of the Project and the prevailing environmental and social conditions within areas that are potentially impacted by the Project. The VEC identification process has been assisted through the completion of engagement activities with applicable stakeholders. This phase of the assessment has also required setting temporal and spatial boundaries of the CIA for specific VECs;
- **Step 2 - Scoping Phase II**: this has required the identification of other projects or human activities that could potentially impact upon defined VECs that could result in cumulative impacts. An analysis has then been undertaken which aims to define those development projects that are scoped into the CIA given their potential ability to generate a cumulative impact associated with the Project (due to temporal or spatial interactions with the Project);
- **Step 3 - Establish information on the baseline status of VECs**: defining the baseline characteristics of VECs is an important stage in the CIA process, as this identifies their sensitivity to change. Note that relevant baseline information has been provided in the ESBS report and is not reproduced here; and
- **Step 4 - Assess Cumulative Impacts on VECs**: taking into account the Project's predicted impacts on identified VECs, an assessment has been undertaken to evaluate the ability of the Project to interact with other planned or reasonably defined developments in such a manner that generates a cumulative impact (where the temporal and spatial influences may coincide). Note that the assessment presented in this Chapter only considers the residual impacts arising from the Project (i.e. impacts following the application of mitigation measures as detailed in this ESIA report). It follows that the Chapter only considers those VECs that will experience any degree of residual impact associated with the Project;
- **Step 5 - Assess significance of predicted cumulative impacts**: significant cumulative impacts have been evaluated as far as possible using the significance matrix presented in Chapter 3 "Impact Assessment Methodology". In principle, this can be possible only where the magnitude of impacts is capable of definition,

[1] IFC (2013) Good Practice Note: Cumulative Impact Assessment and Management – Guidance for the Private Sector in Emerging Markets (August 2013). Good Practice Handbook on Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets (ifc.org)

for example, through readily accessible documents (e.g. other EIA or ESIA reports or project documentation). Where such information is not available, as in the case here, the assessment of potential cumulative impacts iis based on publicly available information (i.e., websites), and has relied on professional opinion using the impact significance definitions described in Chapter 3 “Impact Assessment Methodology”. The assessment has not considered unplanned events as discussed in Chapter 11 “Unplanned Events”; and

- **Step 6 - Management of cumulative impacts**: in instances where the CIA indicates the potential for a cumulative impact of medium to high significance, the necessity for supplementary mitigation or management measures (or monitoring) beyond those targeting project-induced impacts is recommended.

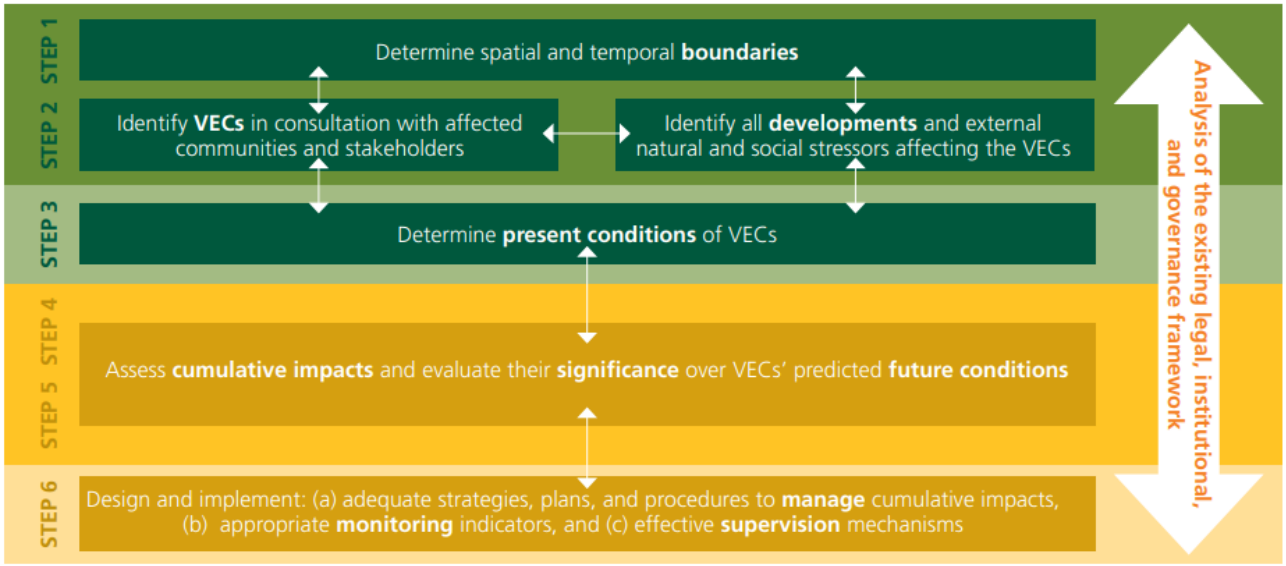

Figure 1: Rapid Cumulative Impact Assessment key steps (source: IFC Good Practice Handbook CIA)

10.3 CIA Scoping Phase I: VECs, Spatial and Temporal Boundaries

10.3.1 VECs identification and eligibility

The ESIA takes into account the potential impacts of the Project on a range of environmental and social components, which are regarded as equivalent to the VECs. The definition of these VECs has been informed by the prevailing environmental and social conditions within the Project AoI, as well as the Project's capacity to impact these resources throughout all phases of the Project. Consultation with relevant stakeholders has been a part of the environmental and social VEC identification process. Social surveys are detailed in ESBS Section 6 “Baseline Conditions – Socio Economic”. A summary of the VECs that have been considered within this ESIA, and thus within this CIA, comprise the following:

- physical (i.e. non-living environmental components, including soil, air quality, noise and vibrations, hydrogeology and surface waters);
- biological (i.e. fauna, flora, habitats and ecosystems); and
- social (i.e. population and demography, economy and employment, community, health, safety and security, mobility and infrastructures, landscape and visual quality, ecosystem services, land use, cultural heritage).

Baseline information on receptors in the ESIA was reviewed along with the stakeholder concerns. As per the IFC guidance note, this CIA considers those VECs that will be impacted by the Project with any degree of

residual impact; thus, VECs for which there are no significant residual impacts have been scoped out of this CIA. Where the Project residual impact significance is defined to be **Medium or High**, the applicable VEC is scoped into the CIA. Residual impacts defined as **Low** have been subject to further evaluation (combining information obtained from site visit, discussion with stakeholders, baseline characteristics collated within the ESIA and assessments conducted by each specialist within the ESIA) to see if there is potential for cumulative impacts to be generated in the interest of adopting a conservative approach.

A VEC screening exercise was conducted to assess the **eligibility of the VECs** (Table 1). VECs that were identified as having eligible status were then subject to a detailed analysis within the context of the potential cumulative impact of the Project and other developmental projects to determine their status as **priority VECs** (Table 3).

Table 1: VECs screening and identification[2]

ESIA Reference	Construction Residual Impact	Operation Residual Impact	Eligible VEC? (C=in costruction; O=in operation)
Physical components			
Geomorphology and Topography	Low (WPP AoI)	-	No[3]
Soil - Removal/degradation of soil and vegetation	Low	-	Yes (C)
Soil and Land Use - Existing of new buildings/infrastructure	Medium	-	Yes (C)
Hydrology and surface water – Change in local hydrology and surface water quality	Low	Low (WPP AoI) Negligible (OHL AoI)	Yes (C;O)
Hydrology and surface water - Existing of new buildings/infrastructure	Low	-	Yes (C)
Hydrogeology and groundwater – Change in the local hydrogeology and groundwater quality	Low (WPP AoI)	Low (WPP AoI)	Yes (C;O)
Hydrogeology and groundwater – Water demand	Low (WPP AoI)	Low (WPP AoI)	Yes (C;O)
Air quality - Greenhouse gas (GHG) emissions	Low	-	Yes (C)
Air quality - Emission of dust and particulate	Negligible	-	No

[2] The ESIA was conducted for both the WPP and OHL, evaluating their respective impacts. In instances where the residual impacts level does not specify “WPP AoI” or “OHL AoI”, it implies that the judgment is applicable to both. Conversely, when only “WPP AoI” is indicated, it means that the OHL impact is determined as negligible and not quantitatively assessed in the ESIA.

[3] The absence of a significant impact on geomorphology and topography is explained by the specific and limited nature of morphological changes, and generally by the consideration of geology and geomorphology as a constraint on design rather than as an environmental component impacted. For these reasons, from a technical and scientific point of view, the impact on geomorphology and topography is excluded as an eligible VEC.

ESIA Reference	Construction Residual Impact	Operation Residual Impact	Eligible VEC? (C=in costruction; O=in operation)
Air quality - Emission of gaseous pollutants	Negligible	-	No
Air quality - Energy demand (fuel and electricity)	Negligible	-	No
Noise and vibrations	Low	Negligible	Yes (C)
Solid waste	High	Medium	Yes (C;O)
Wastewater	High (WPP AoI)	Low (WPP AoI)	Yes (C;O)
Shadow Flicker	-	Negligible (WPP AoI)	No
Biological components			
Terrestrial habitats and ecosystems (all flora and fauna	Low to High	Low to Medium (to be confirmed)	Yes (C;O)
Freshwater habitats and ecosystems	Negligible	Negligible (to be confirmed)	No
Protected Areas	Medium	Low to Medium (to be confirmed)	Yes (C;O)
Social components			
Demography - Workers' influx	Low	Negligible	No[4]
Economy and employment - Demand for Goods, Materials and Services	Low	Low (positive)	Yes (C;O)
Economy and employment - Demand of Workforce	Medium (positive)	Low (positive)	Yes (C;O)
Economy and employment - Improvement of Road Networks	Very High (positive)	-	Yes (C)
Community health, safety and security - Emission of dust, articulate matter and gaseous pollutants	Negligible	-	No
Community health, safety and security - Emission of noise and vibrations	Negligible	Negligible	No
Community health, safety and security - Emission of light	Negligible	-	No
Community health, safety and security - Emission of shadow flickering	-	Negligible	No

[4] The temporary influx of workers may have local economic effects (increased consumption, demand for services, temporary employment), as assessed in the ESIA and in this chapter. However, it does not result in structural changes in the demographic composition. The personnel employed in construction are almost always temporary residents or commuters from neighbouring areas, so there is no stable increase in the resident population, which is a necessary condition for demographic impact in the strict sense (such as changes in birth/death rates, age structure, stable migration flows).

ESIA Reference	Construction Residual Impact	Operation Residual Impact	Eligible VEC? (C=in costruction; O=in operation)
Community health, safety and security - Demand for solid waste treatment/disposal	Negligible	Negligible	No
Community health, safety and security - Demand for liquid waste, wastewater treatment/disposal	Negligible	-	No
Community health, safety and security – Workers' influx	Low	Low	Yes (C;O)
Community health, safety and security – Demand for security management	Negligible	Low	Yes (C;O)
Community health, safety and security – Increase of traffic	Negligible	Low	Yes (O)
Community health, safety and security – Water demand	Low	Low	Yes (C;O)
Mobility and infrastructures – Energy demand	Low	Low	Yes (C;O)
Mobility and infrastructures – Increase of traffic	Negligible	Negligible	No
Mobility and infrastructures – Interference with roads/ infrastructures/ services	Negligible	-	No
Mobility and infrastructures – Workers' influx	Low	Negligible	Yes (C)
Mobility and infrastructures – Improvement of road network	Very High (positive)	-	Yes (C)
Mobility and infrastructures – Provision of electricity to the national grid	-	Medium (positive)	Yes (O)
Landscape and visual quality - Degradation of soil and vegetation	Negligible	-	No
Landscape and visual quality - Change in the local morphology and topography	Negligible	-	No
Landscape and visual quality - Emission of light	Negligible	Negligible	No
Landscape and visual quality - Presence of new buildings/infrastructures.	Negligible	Negligible	No
Ecosystem services - Degradation of soil and vegetation	Low	.	Yes (C)

ESIA Reference	Construction Residual Impact	Operation Residual Impact	Eligible VEC? (C=in costruction; O=in operation)
Ecosystem services - Change in the local hydrology and surface water quality	Medium	.	Yes (C)
Ecosystem services - Change in the local hydrogeology and groundwater quality	Medium	.	Yes (C)
Ecosystem services - Water demand	Low	.	Yes (C)
Land Use	Low	Low	Yes (C;O)
Cultural heritage	Low	-	Yes (C)
Other climate change -related drivers (e.g. wildfires, droughts, floods)	This does not apply strictly.	This does not apply strictly.	Yes

10.3.2 Temporal and spatial boundaries

The **temporal boundaries** of the CIA are defined as the timescale over which a project is likely to generate cumulative impacts. To define the temporal extent of the CIA, VECs are described based on their susceptibility to being affected by cumulative impacts by construction or operational activities. A ten-year outlook from the Project's construction stage is considered, reflecting the expected timeframe for the full life cycle of the Project (at least, pre-construction, construction and operation at regime) and the precautionary estimated timeframe of the potential highest impacts to extend beyond.

The temporal boundaries of the CIA are also limited by the extent of current knowledge of other sources of cumulative impacts, particularly non-project related activities. As a matter of fact, the degree of uncertainty increases the further into the future the assessment extends.

The **spatial or geographic boundaries** of the CIA have been defined with reference to the Project characteristics (ESBS Chapter 2 “Project Description”). The areas of influence (i.e., AOIs) applied to defined VECs are congruent with those delineated for the corresponding individual environmental and social components and included within the various technical assessments within this ESIA report.

It is imperative to acknowledge that these AOIs delineate the expected upper limits of the Project's impacts and have been adopted in this CIA on the assumption that if the areas of influence of other projects intersect the Project’s AOIs, the conditions for cumulative effects to occur are present. In the event of non-intersection of the AOIs, the condition for the occurrence of cumulative impacts is not met. Nonetheless, within the scope of the present CIA, it is important to recognise that, in view of the prevailing constraints on the available information concerning the other projects, it is not feasible to delineate the geographical boundaries of the cumulative impacts in their totality.

Consequently, a flexible approach has been maintained, such that the boundaries of the CIA assessment vary depending upon the characteristics of the potentially impacted VEC. The geographic boundary, therefore, exhibits variability, ranging from the spatial extent of a small VEC feature (e.g., a discrete element of a settlement) to a large geographic region or habitat within which a particular VEC is present (e.g., the habitat occupied by a threatened species). The spatial extent of relevant VECs is detailed in the various technical Chapters as presented within this ESIA report, and summarized below for reader’s convenience:

- physical components (soil, air, water, noise, shadow flicker): a 10 km radius around the Project footprint. With regard to physical components, direct environmental impacts (e.g., air pollutants emissions, water discharges, surface alterations to the soil) generally have a limited spatial scope. However, it is also necessary to take into account indirect or widespread effects on a larger scale. The 10 km radius is considered sufficient to understand the direct and indirect effects of construction and plant operation activities, and adequate to characterize the environmental context in which the Project is located (morphology, land use, hydrography, geology, air quality);
- social components (communities, generation of traffic, workforce and security): a 10 km radius around the Project footprint. The decision to consider a radius of 10 km allows for conducting an appropriate examination of the socio-economic structure and services, including the communities that may be potentially affected in terms of perception and indirect impacts.
- biological components: a 70 km radius around the Project. The selection of a 70 km radius for the evaluation of biodiversity impacts is substantiated by the following rationale:
    - the adoption of an extended range is consistent with the precautionary principle, thereby averting underestimations that could potentially compromise the protection of endangered or protected species;
    - ecological characteristics of potentially present bird species (nesting, resting and feeding sites, migratory transit areas, potential preferred migration routes) and extent of daily movements (i.e., 70 km is determined as a mean distance travelled daily by the various bird species present in the study area) and home ranges (variable home ranges);
    - international migration routes crossing the territory; and
    - risks of cumulative and indirect impacts.

Finally, following the collation of data obtained during the baseline assessment, a decision was made to expand the AoIs for waste management, air (emission of GHG) and social issues to encompass a more extensive administrative area, corresponding at least to the Žambyl and Almaty regions.

10.4 CIA Scoping Phase II: other developments

10.4.1 Data gathering process

WSP screened for sources of potential cumulative impact (SCI) located in the Žambyl and Almaty regions and in proximity of the Project site to determine if there is any planned or reasonably predictable future development envisaged there that may interact with the Project and generate cumulative effects.

Information was gathered from a variety of sources, including review of free literature (e.g., websites), social surveys and consultations with local bodies.

Information was particularly searched for projects applying for environmental or planning permits, and those granted environmental or planning permits since the Project ESIA preparation. Emphasis was placed on those projects large enough to require an EIA/ESIA.

10.4.2 Identification of Existing and Future Projects

This section presents the planned and reasonably defined or foreseeable SCIs identified up to September 2025 identified in the Žambyl and Almaty regions. In the interest of comprehensiveness and to furnish a more extensive overview of the activities impacting the specified area, current operating projects have also been incorporated into the table.

Potential SCIs were then assessed to identify if their impacts could impact a VEC identified for the Project. If the Project is able to interact with such developments (temporally and/or spatially), the Project may be able to generate a cumulative impact.

The subsequent table provides a list of the identified projects for which sufficient information was available for an assessment of cumulative impacts, including, as an example, the timeframe for project implementation. Projects indicated in shaded rows have either been completed or are no longer under consideration, thus being excluded from cumulative impact assessment (see Chapter below). The table provides a brief description of the nature and characteristics of these projects.

Table 2: Existing and future projects identified in the Žambyl region, Almaty region and in proximity of the Project site

Project ID	Short description	Location and Region	Timeframe for development	Distance of the Mirny Project
Thermal Power Plant (Planned and stopped)	The plant was originally planned in the 1970s to be 4,000 MW to service growing demand from the chemical industry, household demand, and general industry. Due to lack of funding in 1996, the project was cancelled. The proposed plant was an on-again, off-again project with more recent proposed completion dates of 2017, 2018, 2019, 2020, and, most recently, 2022. The plant would have burned coal from the Ekibastuz coal basin. As of 2022, Ulken nuclear power plant was proposed instead at this location.	Next to Ulken (Almaty region)	Construction started in 2012, but stopped	WPP: about 50 km southwards OHL: less than 5 km southwards
Nuclear Power Plant (Planned)	The plant will feature two reactors with a combined capacity of 2.4 gigawatts (exact location still unknown). The feasibility study preparation is ongoing, the start of construction is in 2.5 to 3 years (i.e., by 2028). Kazakhstan has selected Russia's Rosatom to construct its first nuclear power plant near the shores of Lake Balkhash, a project aimed at meeting domestic energy demands and utilizing the country's vast uranium resources. The decision followed a referendum in late 2024 where voters supported the construction, and Rosatom was chosen for its VVER-1200 reactor technology and preferential funding terms.	Next to Ulken (Almaty region)	A groundbreaking ceremony in August 2025 marked the formal start of the project survey work, while construction is planned to begin in the near future and commissioning potentially by 2035-2036.	WPP: about 50 km southwards OHL: less than 5 km southwards
Monobarite Deposit (Operating)	Deposit owned and managed by Vostochnoe Rudoupravlenie	Shyganak (nearby Ulken, 22 km northwest of the Shyganak railway	Operating	WPP: about 50 km southwestwards

Project ID	Short description	Location and Region	Timeframe for development	Distance of the Mirny Project
		station and 24 km west of Lake Balkhash)		OHL: less than 5 km northwards and westwards
Akbakay Gold Mine (Operating)	Owned by JSC AK Altynalmas. The mine uses open-pit and underground mining methods to extract gold and produces raw gold, known as 'Doré'.	Akbakay (Žambyl region)	Operating	WPP and OHL: about 60 km eastwards
Maykol Granite Deposit (Operating)	Developed after 1970s	North of Akbakay (Žambyl region)	Operating	WPP and OHL: about 60 km eastwards
Mynaral Gold Mine	Explored by Mynaral Gold and Mynaral Resources and containing estimated 4.7 tons of gold. It is part of the larger Mynaral ore field, which includes 20 gold-bearing objects and other mineral occurrences.	Mynaral (Žambyl region)	Under commissioning/start of development	WPP: more than 100 km southwards OHL: about 40 km southwards
Jambyl Cement Plant (Operating)	Operated by Kazakhmys company. The plant is positioned along the Almaty-Astana highway and has access to major construction markets within the country. The plant produces 1.4 million tons of cement per year and exports some of its production.	Mynaral, on the shores of Lake Balkhash (Žambyl region).	Operating	WPP: more than 100 km southwards OHL: about 40 km southwards
Khantau Cement Plant (Хантауский цементный завод)	Also known as AO "ACIG".	Khantau, Moiynkum District, Zhambyl region	Started in 2015. Mothballed	WPP and OHL: less than 10 km northwestwards
Shokpar gold and Non-Ferrous Metal quarry	The region hosts major mining operations for phosphorites, such as the "EuroChem-Karatau LLC" mine Several other desposits or quarries are known to be present in the mentioned regions, however information on their locations was not found. In these quarries a variety of materials is extracted, including phosphorites, fluorspar, gold, copper ore, and decorative and construction stones like granite.	Korday District, Zhambyl region	Operating	WPP: more than 150 km northwestwards OHL: more than 50 km northwestwards
Kurty granite quarry (Operating)		Zhambyl region	Operating	WPP and OHL: distance not definable
Korcem Cement Plant (Korcem LLP)	A joint venture between Korcem, International Cement Korday, a subsidiary of Singapore-based International Cement Group which holds a majority stake, and Nurzhan Shakirov. The location is planned in the Kordai district with a capacity of 1.5 million tons per year.	Kordai district, Zhambyl region (exact location unknown).	Planned. No additional information available on public domain.	WPP: more than 150 km northwestwards OHL: more than 50 km northwestwards

As shown in the table, the projects/installations operating and planned in the Project surroundings mainly consist of large mines, cement plants and a nuclear plant. Such types of installations have major potential impacts on

physical, social and biological components when compared to the Project. The Project is expected to contribute to the cumulative positive and negative impacts mainly during the construction phase because of the activities and the amount of equipment, materials and people transported to and from the Project AoI.

10.5 CIA and significance assessment

Cumulative effects of the Project with other existing projects are considered mostly covered in the impact assessment sections of this ESIA report as the effects of existing projects contribute to the baseline conditions of the Project's AoI investigated and described in the ESBS sections. Existing and operating projects have therefore been scoped out of the assessment and this chapter primarily focuses on planned or reasonably defined developments (as identified in Chapter 10.4 above), namely the Ulken Nuclear Power Plant, the Mynaral Gold Mine and the Korcem Cement Plant.

All eligible VECs identified in paragraph 10.3.1 above were analysed against the following criteria:

1) reasonably expected to be impacted by the Project (i.e., at least one potential impact significance rating of Low or above – already deemed as eliglible VEC);

2) valued by an identifiable stakeholder group / scientific concern; and

3) reasonably expected to be potentially impacted by some combination of other projects.

To be selected as a priority VEC and included in the CIA, the VEC had to meet all three criteria. Table 3 presents the results of this analysis and highlights the **priority VECs** selected. Impacts that would occur regardless of the presence of the Project are not scoped into this assessment in accordance with IFC guidance note (GN) 41, which states that the CIA should exclude potential impacts that would occur without the Project or independently of the Project. However, other natural and human pressures affecting VECs are taken into account. To be considered in the assessment, the priority VEC must be affected by both the Project and other projects and the impact of the Project and the other projects must occur in the same timescale.

Table 3: Selection of priority VECs

Eligible VECs	Expected to be impacted by the Project (Eligible VEC)	Important / Sensitive for Stakeholders - Scientific concern	Project's AOIs expected to be potentially impacted by some combination of other projects	Priority VEC
Physical components				
Soil and Land Use - Removal/degradation of soil and vegetation	Yes (C)	Yes	No	No
Soil and Land Use - Existing of new buildings/infrastructure	Yes (C)	No	No	No
Hydrology and surface water – Change in local hydrology and surface water quality	Yes (C;O)	Yes	Yes	Yes
Hydrology and surface water - Existing of new buildings/infrastructure	Yes (C)	No	No	No

Eligible VECs	Expected to be impacted by the Project (Eligible VEC)	Important / Sensitive for Stakeholders - Scientific concern	Project's AOIs expected to be potentially impacted by some combination of other projects	Priority VEC
Hydrogeology and groundwater – Change in the local hydrogeology and groundwater quality	Yes (C;O)	Yes	Yes	Yes
Hydrogeology and groundwater – Water demand	Yes	Yes	Yes	Yes
Air quality - Greenhouse gas (GHG) emissions	Yes (C)	Yes	Yes	Yes
Noise and vibrations	Yes (C)	Yes	No	No
Solid waste	Yes (C;O)	Yes	Yes	Yes
Wastewater	Yes (C;O)	Yes	Yes	Yes
Biological components				
Terrestrial habitats and ecosystems (all flora and fauna	Yes (C;O)	Yes	Yes	Yes
Protected Areas	Yes (C;O)	Yes	Yes	Yes
Social components				
Economy and employment - Demand for Goods, Materials and Services	Yes (C;O)	Yes	Yes	Yes
Economy and employment - Demand of Workforce	Yes (C;O)	Yes	Yes	Yes
Economy and employment - Improvement of Road Networks	Yes (C)	Yes	Yes	Yes
Community health, safety and security – Workers' influx	Yes (C;O)	Yes	Yes	Yes
Community health, safety and security – Demand for security management	Yes (C;O)	Yes	Yes	Yes
Community health, safety and security – Increase of traffic	Yes (O)	Yes	Yes	Yes
Community health, safety and security – Water demand	Yes (C;O)	Yes	Yes	Yes

Eligible VECs	Expected to be impacted by the Project (Eligible VEC)	Important / Sensitive for Stakeholders - Scientific concern	Project's AOIs expected to be potentially impacted by some combination of other projects	Priority VEC
Mobility and infrastructures – Energy demand	Yes (C;O)	Yes	Yes	Yes
Mobility and infrastructures – Workers' influx	Yes (C)	Yes	Yes	Yes
Mobility and infrastructures – Improvement of road network	Yes (C)	Yes	Yes	Yes
Mobility and infrastructures – Provision of electricity to the national grid	Yes (O)	Yes	Yes	Yes
Ecosystem services - Degradation of soil and vegetation	Yes (C)	Yes	Yes	Yes (C)
Ecosystem services - Change in the local hydrology and surface water quality	Yes (C)	Yes	Yes	Yes (C)
Ecosystem services - Change in the local hydrogeology and groundwater quality	Yes (C)	Yes	Yes	Yes (C)
Ecosystem services - Water demand	Yes (C;O)	Yes	Yes	Yes (C)
Land Use	Yes	Yes	Yes	Yes (C;O)
Cultural heritage	Yes	Yes	No	No
Other climate change - related drivers (e.g. wildfires, droughts, floods)	This does not apply strictly.	Yes	This does not apply strictly.	Yes (C;O)

The following paragraphs provide a **priority VEC assessment** of likely significant cumulative impacts of the Project in combination with SCIs. The Mirny Project timelines are those used as a reference to establish the zero point of "construction" and "operation".

10.5.1 Hydrology and surface water / Hydrogeology and groundwater

Project impacts on hydrology and hydrogeology are described in Chapter 04. The two most significant water bodies in the Project AoI (Lake Balkhash to the north, and the Shu River to the south) are located far from the WPP site itself, but very close to the OHLs. While there is no reason to believe that the construction of the OHL

to the SS Yukgress will cause any disruption to the waters of Lake Balkhash since the SS is located in the highest part of the plateau, at a distance of 350 m from the lake, the OHL section that will be connected to the SS Shu, in the south, will literally cross the Shu River and the tributary Kuragaty River. However, given the distance between the pylons and the waterbody, the construction activities in this section are predicted to have a low potential to disrupt watercourses and wetlands.

During the construction phase, potential cumulative impacts on hydrology and surface waters, particularly on change in hydrological regime, are thus not expected in combination with either the planned Nuclear Plant in Ulken or the Mynaral Gold Mine. Conversely, it is plausible that the Korcem Cement Plant could cumulatively affect in some way the Shu River, leading to changes in water quality, increased turbidity, and resuspension of material.

Regarding water demand, the cumulative demand for water for cooling, washing, industrial processes and dewatering can lead to a conflict over water resource use generating:

- over-exploitation of surface and groundwater resources;
- impacts on availability for agricultural or civil use;
- potential conflict between industrial operators and local communities.

The Project's has the potential to impact groundwater since water wells will be drilled onsite at the WPPs location to provide water for construction activities and water trucks could be also used as an extra support, if needed. Concurrently, it is assumed that the projects under consideration will require water for both the construction and operational phases.

A salient factor that merits consideration is the water scarcity characteristic of the Project AoI, which renders water management particularly relevant for this undertaking, especially in light of the supposed substantial water consumption for the concrete plant and nuclear plant activities. The abstractions of groundwater have the potential to exert pressure on water systems, with the possibility of affecting local users. Indeed, the Mirny community has expressed concerns regarding the scarcity of potable water. The perception of projects working simultaneously may further increase these concerns.

Furthermore, the indiscriminate extraction of water without consideration for recharge rates may lead to groundwater depletion, potentially impacting local users. Moreover, the overexploitation of the aquifer has the potential to affect its permeability, thereby creating fast paths for pollutants and causing groundwater contamination.

Coordinated mitigation measures are to be implemented in the construction phase to mitigate potential adverse cumulative impacts on the VEC.

In the operation phase, it is expected that the Project will not contribute to the cumulative impacts on waters.

Priority VEC Hydrology and surface water – Change in local hydrology and surface water quality

Estimated CIA significance: Low (construction), Low (operation)

Priority VEC Hydrogeology and groundwater – Change in the local hydrogeology and groundwater quality

Estimated CIA significance: Low (construction), Low (operation)

Priority VEC Hydrogeology and groundwater – Water demand

Estimated CIA significance: Medium (construction)

10.5.2 Solid waste

The improper management of solid waste (e.g., its spread or abusive accumulation on the bare soil) may lead to soil and surface water pollution and air quality degradation (due to odour and pollutants' emissions) both onsite and offsite.

Hazardous waste, if spread on soil or in surface water bodies, can result in highly pollutive events. Currently, it is identified a lack of appropriated solid waste landfills and treatment plants in Mirny vicinities (< 200 km) to treat large part of the waste that will be generated.

A comparison of the waste generated by the project and the other SCIs under consideration in the construction phases reveals a high degree of similarity. The waste includes excavated earth, vegetation, construction materials such as concrete and rebar, packaging, various metals and plastic.

During operation, Nuclear Power Plant waste types expected are low, medium and high-level radioactive waste, conventional hazardous waste (solvents, resins, water treatment sludge, contaminated materials, solid urban and special waste); for the gold quarry expected waste are large volumes of potentially contaminated waste rock, hazardous waste such as sludge containing cyanide and heavy metals, waste oils, chemical reagents and solid emissions (fine dust containing arsenic or mercury), while for the cement plant production waste such as cement dust, clinker, combustion residues are foreseen.

Despite the fact that each of the third-parties projects considered in the assessment produce a distinct type of waste and generates a unique quantity of waste, the spatial and temporal coexistence of the projects will have the potential to generate cumulative impacts on a regional scale with regard to the management of solid and hazardous waste both during construction and operation phases.

The projects, when considered collectively, are likely to generate substantial quantities of special and hazardous waste, which may exceed the region's current collection, treatment and disposal capacities causing the local capacity overloading.

In the absence of integrated planning, the waste generated in each project is at risk of being managed in a fragmented manner. For instance, the dearth of facilities for managing e.g. hazardous solid waste generated during the construction (dry batteries, empty chemicals bins and cans, oil-containing parts, equipment and machinery parts), or wind turbine blades or the limited capacity of plants for treating radioactive waste will result in an increase in temporary storage or the export of waste, which carries with it significant costs and risks showing an inadequate management of the material life cycle

Finally, adverse effects on the population might be present. The increase in heavy traffic for the transportation of waste (particularly to facilities external to the region), the potential loss of public confidence in the safety of the projects, and the visual and olfactory impact of waste accumulation have the capacity to engender social tensions and a deterioration in the quality of life within local communities.

In order to reduce the impact of cumulative effects, an integrated mitigation strategy should be set up to:

- engage with local authorities to synergistically cooperate in the regional waste management planning, with investments being made in shared infrastructure (e.g. incinerators, chemical treatment plants, temporary storage facilities);
- implement a unified environmental monitoring system to facilitate the expeditious identification of deleterious interactions between projects;
- establish a transparent communication with local people regarding waste flows and safety measures.

Priority VEC Solid Waste

Estimated CIA significance: High (construction), High (operation)

10.5.3 Wastewater

The improper management of liquid waste (e.g., the accumulation on the bare soil of dripping hazardous products drums containing residues and the ineffective collection and conveyance of wastewater to treatment stations) may lead to leaks and spills generating soil and surface water pollution, and air quality degradation (i.e., odor emissions) both onsite and offsite.

It should be considered that in the Project AoI or in its vicinities there is no public sewage system, so the Company plans to treat domestic sewage waste through a closed-cycle wastewater treatment system. This information is still pending confirmation.

The Project AoI will be also served with stormwater drainage systems.

As far as concerned, the OHL corridor and the roads construction sites will not be served by any kind of wastewater treatment facility or liquid waste temporary accumulation area. Currently it is not known how wastewater generated during the OHL construction will be managed.

Despite the fact that each of the third-parties projects considered in the assessment produce a distinct type of wastewater and generates a unique quantity of waste in construction and operation, the spatial and temporal coexistence of the projects will have the potential to generate cumulative impacts in the region with regard to the management of wastewater.

The total amount of wastewater generated by the four projects has the potential to increase pressure on receiving water bodies and exceed the assimilation capacity of surface water bodies (Shu River, tributary Kuragaty River and Lake Balkhash) or aquifers used for drainage and irrigation. The cumulative effect may result in water quality decrease, by a reduction in the parameters of biological oxygen demand (BOD), chemical oxygen demand (COD), metals, cyanides, and radionuclides, and impairment of aquatic ecosystems.

In addition, the presence of waste containing heavy metals, cyanides and radionuclides, in the absence of an efficient waterproofing system and continuous monitoring, can generate:

- infiltration into deep groundwater;
- long-term persistent contamination (especially for radionuclides and metals);
- high health risk for agricultural or domestic wells.

In order to reduce the impact of cumulative effects, an integrated mitigation strategy should be set up to:

- explore the potential for the establishment of a consortium wastewater treatment facility, equipped with dedicated lines for the management of complex industrial wastewater, such as that containing radionuclides and cyanides;
- collaborated in a coordinated environmental monitoring, with installation of a network of piezometers and monitoring stations shared by all projects.

Priority VEC Wastewater

Estimated CIA significance: High (construction), Medium (operation)

10.5.4 Air quality - Greenhouse gas (GHG) emissions

The Project's cumulative effects at global level are assessed with respect to emissions of GHGs.

Due to the distinctive nature of the impact of GHGs associated with climate change, a distinct approach to the assessment of other types of impact has been adopted in this cumulative impact assessment. It is imperative to acknowledge that each source of greenhouse gas emissions contributes to cumulative impact, ultimately resulting in a shared impact on the same VEC. This is due to the fact that the climatic impact of a specific GHG emission cannot be measured or separated from other emissions that occur worldwide and are, in effect, all sources of cumulative impact.

The emission of GHGs related to the use of equipment and machinery, mainly carbon dioxide (CO_2), is associated with the construction and operations of the Project. ESBS Chapter 2 (Project Description) and ESIA Chapter 4 (Impact Assessment and Mitigation – Physical Components) provide an overview of GHG sources of the Project for the construction phase.

The Project's GHGs have been estimated as part of this ESIA. In the impact assessment chapters for the Project, it is highlighted that the CO_2 emissions expected during the project construction phase will be negligible in terms of their contribution to Kazakhstan's yearly GHG emissions, due to the short- to medium-duration nature of the emissions and their sporadic character. Furthermore, it is expected that the absence of such emissions during the operation phase is a consequence of the nature of the Project.

It is predicted that the combined effect with the other SCIs (Ulken Nuclear Power Plant, Mynaral Gold Mine, Korcem Cement Plant) will result in elevated levels of GHG emissions when compared to the Project's own emissions profile. This predicted increase is expected to contribute to an augmentation of the prevailing baseline conditions. In summary, the Project is not expected to be a significant cumulative contributor of GHG as per the calculations based on current data available and traffic projections.

Priority VEC Air quality - Greenhouse gas (GHG) emissions

Estimated CIA significance: Negligible (construction), Low to Medium (operation)

10.5.5 Biodiversity - Terrestrial habitats and ecosystems, Freshwater habitats and ecosystems, Protected Areas

Most of the residual impacts on biodiversity from the Project are either of high or medium significance, indicating that the Project has the capacity to have potentially significant cumulative impacts on biodiversity VECs when other developments are taken into account.

The potential cumulative impacts range from short-term to long-term in nature and will occur to greater or lesser extent. The majority of these impacts will be experienced during the Project operational phase, but their nature indicate they will also be present during construction.

The simultaneous construction of multiple projects leads to the progressive fragmentation of the ecological mosaic and will result in some degree of:

- habitat loss and degradation (including introduction of invasive or alien species);
- displacement of fauna species;
- reduction in connectivity of biodiversity corridors;
- aquatic habitat degradation (including introduction of invasive or alien species).

These changes can compromise ecological connectivity, which is essential for the resilience of animal populations, particularly large mammals, large birds of prey, and migratory birds.

The cumulative impact could exceed ecological thresholds, beyond which ecosystems lose their ability to regenerate (threshold effect risk). This is particularly relevant in arid and semi-arid ecosystems, where natural resilience is already reduced.

An integrated mitigation and compensation strategy should be considered as follows:

- rather than project-specific ones, landscape-scale measures are recommended to adequately address cumulative impacts;
- establish a coordinated ecological monitoring. This should be achieved by organising a joint wildlife monitoring programme, with a particular focus on birds, and target species to assess any decrease in their population in the area; and
- involve local communities in biodiversity conservation.

Priority VEC Terrestrial habitats and ecosystems

Estimated CIA significance: Medium (construction), Low-Medium (operation)

Priority VEC Freshwater habitats and ecosystems

Estimated CIA significance: Low (construction), Low-Medium (operation)

Priority VEC Protected Areas

Estimated CIA significance: Medium (construction), Low-Medium (operation)

10.5.6 Socio-economic conditions

The majority of socio-economic negative impacts for the Project will occur during the Project construction phase. These impacts are expected to be felt by communities in close proximity to Mirny. Similarly, both positive and negative cumulative social impacts are possible.

The potential for socio-economic impacts during construction periods is further compounded by the interplay with the other concurrent developments identified, as follows:

- residents may be concerned about potential risks to community safety and livelihoods related to increased numbers of non-local workers and traffic safety, with any cumulative demand for non-local labour likely to increase these concerns;
- the concurrent construction of interacting projects has the potential to increase demand for labour in the local and regional economy, particularly for workers with construction skills. The demand for construction workers within a similar timeframe will result in cumulative demand for construction labour;
- there is the potential for cumulative increase in traffic around Mirny, Shyganak and Ulken as a result of workers commuting or heavy vehicles impacting on local road safety. There is also the potential for accelerated pavement deterioration due to the increased number of vehicle movements during construction, if the Project is scheduled to overlap with other SCIs using the existing local road network;
- cumulative supply chain impacts are likely to be realised where construction timeframes overlap and comparable materials are required. Opportunities to supply these projects may include the supply of fuels, equipment, and materials sourced from borrowings and quarries. In instances where materials are sourced

within the surrounding regions, increased local expenditure is likely to stimulate local and regional economic activity;

- the simultaneous launch of projects may generate a temporary demographic peak, with imbalances between supply and demand for services. In sparsely populated areas or those lacking adequate urbanisation, a sudden influx of workers can have destabilising effects in the short term;
- the increase of activities will likely affect the grazing activities, and thus nomadic shepherds, through a decrease of land available and an increase of traffic-related disturbance.

During the operation phase, the anticipated developments of the other projects will increase traffic, increase access to rural areas and potentially affect social values in the same way as the Project. Conversely, a favourable impact on socio-economic factors is anticipated.

Also, the projects operation will likely affect the local communities positively, while the negative effects will decrease (e.g., decrease of people influx and workers' camp, low equipment and materials transportation activities). The presence of the projects will result in an influx of population due to an increase of employment opportunities. This will affect the local economy both positively (jobs and services availability) and negatively (price increase, conflicts due to arrival of people having different ethnicities or religions). The area is mostly undeveloped; the increase of activities around will surely affect the ambient noise and the traffic due to equipment and machinery transportation and operation.

Collectively, the operation of the Project and the other identified developments would contribute to long-term employment opportunities, business stimulation, improved road networks and provision of electricity to the national grid for the residents of potentially affected communities. However, unless they are integrated into a broader vision of territorial development, infrastructures designed to serve industrial projects could not benefit communities.

In order to minimise negative impacts and maximise benefits for the local population, the following actions are recommended:

- coordinate projects in order to:
    - ensure construction timelines are managed effectively;
    - optimise the management of labour flows;
    - share infrastructure use where possible;
- involve local communities through mechanisms for public consultation and shared benefit agreements;
- establish a coordinated continuous social monitoring. The following key indicators should be given full consideration:
    - local employment rates;
    - access to services;
    - migration and demographic pressure;
    - perceived quality of life; and
- coordinate with local authorities to align projects' needs with Local Development Plans to ensure long-term effectiveness and consistency with social priorities.

Priority VEC Economy and employment

Estimated CIA significance: High (construction), Medium (operation)

Priority VEC Community health, safety and security

Estimated CIA significance: Medium (construction), Low (operation)

Priority VEC Mobility and infrastructures

Estimated CIA significance: Medium positive (construction), Medium positive (operation)

10.5.7 Other climate change-related drivers on ecosystem services

In recent years, the Žambyl and Almaty regions is undergoing an industrial development, with projects primarily in the mining sector (particularly rare metals and uranium) and energy sector, as evidenced by the SCIs examined in this assessment.

In the absence of a sustainable planning framework, these projects have the potential to cumulatively exacerbate the impacts of climate change on ecosystem services, as follows:

- water consumption and pollution: this issue is of particular concern, where large-scale industrial activities result in the utilisation of substantial quantities of water, frequently resulting in the discharge of contaminated water into local water bodies;
- habitat fragmentation: characterised by the disruption of natural ecosystems due to the construction of infrastructure such as roads, and mines.
- loss of vegetation cover: a key factor in the decline of ecosystem resilience to climate shocks. Deforestation (not applicable in this context) and changes in land use (especially due to mining projects) have been identified as key drivers of this phenomenon, as they reduce the capacity of ecosystems to absorb and adapt to such disturbances; and
- air emissions: contributing to local warming and air quality degradation, with effects on human health and agricultural productivity.

Areas which have been degraded by industrial activity are more vulnerable to fires and droughts; pollution could have a detrimental effect on the resilience of ecosystems when confronted with extreme climatic events and the loss of ecosystem services has the capacity to diminish the population's capacity to adapt to future changes.

The most significant challenge is rooted in the interplay between the two pressures, climatic and anthropogenic, which serve to reinforce each other. The interactions between these pressures give rise to systemic vulnerabilities, which in turn impact the resilience of the entire territory. The following are illustrative examples relevant to the context under examination:

- the impact of climate change on water resources is multifaceted and interconnected. The ongoing droughts resulting from climate change have been shown to reduce the flow of watercourses and groundwater availability. This, in turn, has might led industries continuing to withdraw water, further reducing the water availability which might result, as an extreme event, in the collapse of the water supply system;
- the occurrence of fires is increasingly frequent due to the presence of dry vegetation. This phenomenon might be further exacerbated by the fragmentation of landscapes resulting from the construction of SCIs and other projects in the future. This leads to a loss of ecological connectivity and the capacity of ecosystems to regenerate;

- it has been demonstrated that flash floods, precipitated by extreme rainfall, are more destructive in deforested or urbanised areas, where there is a paucity of natural vegetation to retain water; and
- finally, it is evident that soil and water contamination has the capacity to diminish biodiversity and fertility, thereby rendering the system more susceptible to the repercussions of climate change and less adept at adapting to them.

The description of cumulative impacts provided thus far considers extreme consequences. Given the considerable distance between the identified SCIs and the individual footprints of the projects, it is not believed that the synergy of the projects with factors affecting climate change could generate a significant exacerbation of the effects themselves within the time frame considered in the present assessment. However, in light of the accelerating rate of climate change, it is imperative to underscore the necessity for a comprehensive and integrated approach to the projects, one that must prioritise the conservation of ecosystem services.

Priority VEC Climate change-related drivers on ecosystem services

Estimated CIA significance: Low (construction), Low (operation)

10.6 CIA Management and Monitoring

As cumulative impacts are generally a consequence of the actions of numerous stakeholders, the responsibility for their management is collective. This necessitates individual actions to eliminate or minimise the contributions of individual projects. The management of cumulative impacts is ultimately the responsibility of government and regional planners. However, it is considered best international practice that project developers make best efforts to engage relevant stakeholders and promote management of cumulative impacts in their project areas (IFC Good Practice Handbook, 2013). It is therefore important to remark that at the time of conducting this CIA, there was limited information on other developments.

A distinction needs to be drawn between management of significant cumulative impacts associated with the Project (i.e. where it can be generally expected that the Project has a large degree of control over mitigation/management) and management/control over impacts outside the Company's control (i.e. because other projects are the main cause of the cumulative impact). In the latter case, the extent to which the Company can influence the actions taken by the proponents of other projects will depend on the extent of any leverage that the Company has to influence the other proponents, if any.

Figure 2 is taken from the IFC Good Practice Handbook to illustrate this difference. It suggests how management/mitigation should proceed ideally, depending on whether the Project has control or can exercise leverage to achieve optimal cumulative impact management.

Figure 2: IFC guidance on responsibility for management and mitigation of cumulative impacts (From IFC Good Practice Handbook, Figure 2)

With reference to the significant cumulative impacts associated with the Project, the full set of Project's mitigation measures identified during the ESIA will also be applicable to the mitigation of cumulative impacts or will have already reduced Project's contribution to a potential cumulative impact to a minimum. However, it is recognised that the cumulative impact assessment may require additional mitigation measures and/or strategic/long-term actions, for example, the need to share findings and cooperate with third parties such as future developers and authorities.

To minimize the Project's contribution to the maximum possible extent, the Company has established an Environmental and Social Management System (ESMS) for the Project (please refer to Chapter 12 and to the companion document "ESMS Framework Document", that describes the framework for the construction and operational ESMS). The ESMS includes mitigation measures and system audit and review procedures to identify any potential for cumulative impacts or effects during construction and to determine and implement relevant mitigations measures. The specific construction management and monitoring measures, together with their adaptive mechanisms, are then available in specific Construction Environmental and Social Management Plans (C-ESMPs) to address all the Project envisaged impacts for each aspect during the construction phase. ESMP for the operation phase (O-ESMP) will be prepared in due course before operation starts to ensure that long term cumulative impacts are duly managed particularly on biodiversity.

The identified Project impacts are already adequately managed by the Company through the application of industry best practice mitigation measures as described in the ESIA mitigation sections and in the C-ESMPs within the ESMS. In many cases, additional commitments beyond best practice have already been identified by the Company to manage specific project impacts.

Regarding management and control over impacts outside the Company, mitigation of cumulative impacts would be required at both the local development scale, under the responsibility of the individual developers, and at the regional scale. The primary mechanism for regional-scale management of VECs should be through strategic regional development assessment and planning, which would typically be the function of the relevant government authorities.

At the Project inception, the Company will prepare a Cumulative Effects Management Plan that will include mitigation measures, system audit and review procedures sufficient to identify any unpredicted cumulative impacts or effects and to determine and implement relevant mitigations measures.

In line with IFC PS Guidance Note 1, the Company will make any reasonable effort to engage other developers (at least with the Nuclear Power Plant project developers and operators), affected communities and, where appropriate, other relevant stakeholders, in the design and implementation of coordinated mitigation measures to manage any potential cumulative impacts identified following the results of this CIA, particularly on biodiversity and social VECs.

10.7 Assumptions and limitations

This CIA has been undertaken based upon the available information contained within this ESIA report. Key assumptions and limitations are detailed below:

- the assessment only considers residual impacts after the implementation of mitigation measures as detailed in this ESIA report (Chapters 4, 5 and 6);
- the assessment has not considered unplanned events as discussed in Chapter 11 “Unplanned Events”;
- the details regarding the third-parties developments are limited and it is unclear whether these activities have been subject to any formal environmental impact assessment process. This has limited the CIA to only consider potential cumulative impacts on a qualitative basis.

10.8 Conclusions

The CIA has been conducted in line with international good practice as outlined in International Finance Corporation (IFC) Good Practice Handbook on CIA (IFC, 2013). The CIA has been undertaken and reported as an independent and objective process.

In common with most cumulative assessments, the CIA has faced challenges in several areas in terms of the reliability of predicting cumulative impacts and stakeholder engagement. Further challenges are likely where mitigation measures are partly or wholly outside Project’s control. In general, the difficulties encountered were due to lack or limited information on sources of cumulative impacts.

This CIA identified the relevant and potential major development projects in the Project’s AoIs and applied a systematic methodology to assessment of cumulative impacts in relation to the Project construction and operation activities.

The potential occurrence of cumulative effects has been considered as being possible during construction and operations. **The CIA found there are currently a few projects that are considered reasonably planned for the near future. The major development projects are the Nuclear Power Plant in Ulken, the Gold Mine in Mynaral and the Korcem Cement Plant in Korday district:** the currently available information indicates that most of them will be developed according to similar timeline of the Project with a potential for interactions and for the generation of cumulative effects.

This CIA has determined that cumulative impacts will primarily be related to waste management, water demand, economy and employment, with a limited Project’s contribution.

The main concern is due to the Nuclear Power Plant in Ulken, which could be perceived as antagonistic to the project itself, moreover in an area where the presence of industries and infrastructure is currently quite limited.

The Client is committed to manage its Project following the highest ES standards as well as to make sure that dialogues are opened with the owners and developers of the surrounding projects.

The full set of Project's mitigation measures identified during the ESIA will also be applicable to the mitigation of cumulative impacts and will have already reduced Project's contribution to a potential cumulative impact to a minimum. Lastly, to enable the implementation of the specific measures highlighted in the relevant priority VEVs assessment chapters, it is imperative to acknowledge the pivotal role of the following activities:

- engagement with local authorities for detailed planning of project activities and identification of any potential for interference and generation of cumulative impacts and of adequate mitigations;
- engagement in meetings with private project developers to align eventual interferences of their projects with the Project and identify geographical overlaps between the two. This will contribute to reducing the potential for cumulative effects to minor or none;
- open a dialogue among the public entities involved (Electrical National Grid network, Nuclear Power Plant developers, Ministries and local Government) on the mutual exchange of information relevant to project planning and arrange coordination meetings, as necessary, to prevent any risk of cumulative effects; and
- assuming simultaneous construction activities occur, or in case there is the potential for cumulative effects to occur during Project operations, necessary measures will be defined on the basis of detailed engineering and construction schedules of the projects.

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