



Mirny (Kazakhstan) 1GW Wind Farm Project

ESBS APPENDIX H - Critical Habitat Assessment (CHA)

Submitted to:

Aktas Energy LLP

Submitted by:

WSP Italia S.r.l.

Via Antonio Banfo 43, 10155 Torino, Italia

+39 011 23 44 211

24685792-002-R-Rev 04

December 2025

Distribution List

Aktas Energy LLP

WSP Italia S.r.l.

Table of Contents

1.0 INTRODUCTION	1
1.1 Purpose of the report	1
1.2 Applicable standards	1
1.2.1 International Finance Corporation (IFC) standards and guidance	1
1.2.2 European Bank for Reconstruction and Development (EBRD) Environmental and Social Requirement 6 (ESR6).....	2
2.0 METHODOLOGY	3
2.1.1 Step 1 – Define the Study Area	3
2.1.2 Step 2 – Stakeholder consultation and initial desktop review of available data	4
2.1.3 Step 3 – Verification of Biodiversity present	4
2.1.4 Step 4 – Critical Habitat Determination.....	4
3.0 CRITICAL HABITAT ASSESSMENT	5
3.1 Data Sources	5
3.2 Limitations	6
3.3 Candidate List of Biodiversity Receptors	6
3.3.1 Screening Summary	6
3.3.2 Determining the EAAA.....	7
3.3.1 Criterion 1/4: Highly threatened and/or unique ecosystems.....	8
3.3.2 Criterion 2/1: Habitat of significant importance to Critically Endangered and/or Endangered species	8
3.3.3 Criterion 3/2: Habitats of significant importance to endemic or geographically restricted species	13
3.3.4 Criterion 4/3: Habitats supporting globally significant migratory or congregatory species	14
3.3.5 Criterion 5: Areas associated with key evolutionary processes	15
3.3.6 Significant biodiversity features identified by a broad set of stakeholders or governments	16
3.4 Priority Biodiversity Features	16
3.5 Natural Habitats	17
4.0 CONCLUSIONS	18
4.1.1 Critical Habitat.....	18
4.1.2 Priority Biodiversity Features	18

4.1.3	Natural Habitat	18
-------	-----------------------	----

APPENDICES

APPENDIX A – SCREENING TABLE

APPENDIX B – FIGURES

APPENDIX C – IBAT REPORT

Acronyms and abbreviations

Acronym and abbreviation	Definition
CHA	Critical Habitat Assessment
CR	Critically Endangered
EAAA	Appropriate Areas of Analysis
EBRD	European Bank for Reconstruction and Development
EN	Endangered
ESIA	Environmental and Social Impact Assessment
EU	European Union
GN	Guidance Notes
IBAs	Important Bird Areas
IBAT	Integrated Biodiversity Assessment Tool
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature and Natural Resources
KBAs	Key Biodiversity Areas
LC	Least Concern
NT	Near Threatened
OHTL	Overhead Transmission Line
PBF	Priority Biodiversity Features
PR	Performance Requirements
PS	Performance Standards
VPs	Vantage Points
VU	Vulnerable
WF	Wind Farm
WTGs	Wind Turbine Generators

1.0 INTRODUCTION

1.1 Purpose of the report

This report details the Critical Habitat Assessment (CHA) for an onshore wind power plant (“WPP”) having 1 GW capacity to be located in Mirny, Kazakhstan (“the Project”).

This CHA has been completed in accordance with International Finance Corporation (IFC) Performance Standard 6 (PS6) and European Bank for Reconstruction and Development (EBRD) Performance Requirement 6 (PR6), as well as the corresponding Guidance Notes (GN). The aim of this process is to identify whether the Project site or parts thereof are Critical Habitat (as per PS6/PR6) or if the Project site contains species qualifying as Priority Biodiversity Features (as per PR6). Additionally, the presence of Natural Habitat (as per PS6) will be identified within this CHA.

1.2 Applicable standards

1.2.1 International Finance Corporation (IFC) standards and guidance

The IFC PS6 (IFC, 2019¹) and Guidance Note 6 (GN6) (IFC, 2019²) have been applied to the Project as best practice international standards. In accordance with IFC PS6, habitats are divided into modified, natural, and critical habitats (CH). CH can be either modified or natural habitats supporting the highest biodiversity value. Identification of CH for the Project has been based on the following criteria:

- Habitat of significant importance to critically endangered and/or endangered species (IUCN Red List);
- Habitat of significant importance to endemic and/or geographically restricted species;
- Habitats supporting globally significant migratory or congregatory species;
- Highly threatened and/or unique ecosystems;
- or an Area associated with key evolutionary processes.

The IFC PS6 states that in areas of CH, the Borrower will not implement any project activities unless:

- No other viable alternatives within the region exist for development of the project on modified or natural habitats that are not critical
- The project does not lead to measurable adverse impacts on those biodiversity values for which the CH was designated, and on the ecological processes supporting those biodiversity values
- The project does not lead to a net reduction in the global and/or national/regional population of any critically endangered or endangered species over a reasonable period of time
- A robust, appropriately designed, and long-term biodiversity monitoring and evaluation program is integrated into the client's management program.

¹ IFC. 2012. Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

² IFC. 2019. IFC's Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

1.2.2 European Bank for Reconstruction and Development (EBRD) Environmental and Social Requirement 6 (ESR6)

The EBRD PR6^[OBJ] sets objectives to protect and conserve biodiversity using a precautionary approach, utilise the mitigation hierarchy to achieve no net loss/net gains where appropriate, maintain ecosystem services, and promote good practice in the management and use of natural resources. Application of PR is supplemented by reference to EBRD's Guidance Note 6 (EBRD, 2023^[OBJ]).

In addition to the Critical Habitat noted above, the ESR6 also identifies "Priority Biodiversity Features" (PBF), with a criterion-based qualitative approach also used to define these receptors. Species/habitats qualifying as PBF's require the Project to ensure there be No Net Loss within the local populations over the lifespan of the Project.

³ EBRD. 2023. Guidance note. EBRD Performance Requirement 6: Biodiversity conservation and sustainable management of living natural resources.

2.0 METHODOLOGY

The CHA process assesses the importance of a defined area to one or more biodiversity receptors that meet the requirements of PR6 and PS6 in terms of Critical Habitat.

Determining the presence of Critical Habitat is a process that is explicitly separate from any consideration of a project's impacts, mitigation strategy, etc. The only influence of a project on the CHA process is for identification of the location and extent of the area to be assessed. This is determined by the Project's Area of Influence (AoI). The AoI is the area over which impacts from the Project could legitimately be expected to occur. This is described fully within the ESIA for the Project.

To assist with the determination of Critical Habitat, the guidance described within PR6 Guidance Note 6 has been followed, along with PS6 Guidance Note.

Critical Habitat is defined similarly within both PR6 and PS6, based upon areas supporting the most sensitive biodiversity that falls into the following criteria (numbering for these criteria varies between the two frameworks, and is aligned for the purposes of this CHA as per Table 1):

Table 1 Critical Habitat Criteria

Criterion (PR6/PS6)	Definition
1/4	Highly threatened and/or unique ecosystems
2/1	Areas of importance to Critically Endangered, Endangered and/or Vulnerable species
3/2	Areas of significant importance to endemic and/or range-restricted species
4/3	Areas supporting globally significant concentrations of migratory and/or congregatory species
5/5	Areas associated with key evolutionary processes or of key scientific value

Any habitat/receptor that triggers one (or more) of the above will result in Critical Habitat being classified (as such, features being considered against the above criteria are referred to as potential 'triggers').

Both PR6 and PS6 make explicit reference to a systematic process to undertaking CHA, comprising four steps. These have been summarised here to frame this report.

2.1.1 Step 1 – Define the Study Area

The study area identified through the ESIA process for the purposes of informing the baseline data collection exercise is further refined as part of the CHA to identify an Ecologically Appropriate Area of Analysis (EAAA) for the receptors being considered.

Both PR6 and PS6 refer to defining an EAAA, which is the spatial area and its ecological processes/functions relied upon by a feature or receptor. The EAAA is used throughout this report as the basis for the application of each of the criteria thresholds to determine Critical Habitat.

Defining an appropriate EAAA is an important step in the CHA process as it ensures assessment of an ecologically relevant feature or area, rather than an area influenced only by the project footprint. It also has inherent appreciation of ecological function across an area and therefore avoids the risk of omitting specific areas in which a Critical Habitat trigger may be present discontinuously or seasonally.

EAAAs are identified for each individual biodiversity receptor being assessed during the CHA process (some grouped together where ecologically appropriate). For those receptors 'screened out' of assessment (i.e., those whose status or population status does not require detailed assessment to conclude Critical Habitat), no EAAA is presented no further consideration of their EAAA population is necessary.

2.1.2 Step 2 – Stakeholder consultation and initial desktop review of available data

Step 2 is a screening and scoping process designed to identify features that may trigger Critical Habitat/Natural Habitat and identify the scope of baseline studies required to corroborate this. This is done through consultation with relevant stakeholders and a review of data and published literature. At this stage, use of the Integrated Biodiversity Assessment Tool (IBAT) is recommended.

2.1.3 Step 3 – Verification of Biodiversity present

This includes baseline fieldwork to confirm, and engagement with relevant stakeholders/specialists to finalize, the list of biodiversity features within the AoI.

2.1.4 Step 4 – Critical Habitat Determination

This comprises quantitative and qualitative screening of confirmed biodiversity elements against critical habitat criteria defined in **Table 2**.

Table 2 PS6 and PR6 Critical Habitat Criteria Thresholds

Criterion (PS6/PR6)	PS6 Threshold	PR6 Threshold
1/4 Threatened habitats		
Habitats that are threatened at a relevant geographical scale	(a) Areas representing $\geq 5\%$ of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN. (a) Other areas not yet assessed by IUCN but determined to be of high priority for conservation by regional or national systematic conservation planning.	(a) Habitat type listed in Annex 1 of EU Habitats Directive marked as “priority habitat type” (b) EAAA ≥ 5 per cent of global extent of an ecosystem type with IUCN status of CR or EN (a) EAAA for ecosystem/habitat determined to be of high priority for conservation by national systematic conservation planning
2/1 Threatened species		
Species listed as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU), including consideration of national/regional lists also.	(b) Areas that support globally important concentrations of an IUCN Red-listed EN or CR species ($\geq 0.5\%$ of the global population AND ≥ 5 reproductive units of a CR or EN species). (c) Areas that support globally important concentrations of an IUCN Red-listed Vulnerable (VU) species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in GN72(a). (d) As appropriate, areas containing important concentrations of a nationally or regionally listed EN or CR species (taken as species listed as EN or CR on the Red Book of Kazakhstan).	(b) EAAA supports species listed in Annex II of Habitats Directive marked as “priority species”. (c) EAAA supports ≥ 0.5 per cent of the global population AND ≥ 5 reproductive units of a CR or EN species, or EAAA supports globally significant population of VU species necessary to prevent a change of IUCN Red List status to EN or CR (d) EAAA for important concentrations of species with national or regional status of EN or CR (taken as species listed as EN or CR on the Red Book of Kazakhstan).
	(e)	(e)
3/2 Endemic/range-restricted species		
Species with limited Extent of Occurrence (EOO), as follows:	(a) Areas that regularly hold $\geq 10\%$ of the global population size AND ≥ 10 reproductive units of a species.	(a) EAAA regularly holds ≥ 10 per cent of global population AND ≥ 10 reproductive units of the species.

<ul style="list-style-type: none"> - For terrestrial vertebrates and plants, restricted-range species are defined as those species that have an EOO less than 50,000 square kilometres (km²). - For coastal, riverine, and other aquatic species in habitats that do not exceed 200 km width at any point (for example, rivers), restricted range is defined as having a global range of less than or equal to 500 km linear geographic span (i.e., the distance between occupied locations furthest apart). 		
4/3 Migratory/congregatory species Species for which a significant proportion of the population cyclically and predictably moves from one geographical area to another and/or gathers in large groups on a cyclical or otherwise regular and/ predictable basis.		
	(a) Areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle. (b) Areas that predictably support ≥ 10 percent of the global population of a species during periods of environmental stress.	(a) EAAA sustains, on a cyclical or otherwise regular basis, ≥ 1 per cent of the global population at any point of the species' lifecycle (b) EAAA predictably supports ≥ 10 per cent of global population during periods of environmental stress***
5/5 Supporting functions required to support 1-4		
Habitats that play a significant role in functioning of areas sufficient to support any of the features covered by the above criteria.	Based upon expert opinion.	Based upon expert opinion.

With regards to Kazakhstan Red Book species, these do not follow IUCN Red List categories, instead adopting a numerical classification; however, these can be broadly aligned with the IUCN Red List categories, as follows:

- Category I: species categorized as Extinct (EX), Critically Endangered (CR), and Endangered (EN);
- Category II: Vulnerable species with declining populations, broadly aligned with IUCN VU status;
- Category III: species that are naturally rare, considered to be the broad equivalent of IUCN NT status;
- Category IV: considered to be broadly equivalent to the IUCN Data Deficient (DD) category;
- Category V: for species that have recovered, such as the Saiga and Steppe Eagle.

In addition to the five criteria above, Critical Habitat can also be classified under two categories that have no predetermined conditions and are instead informed solely on the basis of expert judgment:

- “...significant biodiversity features identified by a broad set of stakeholders and governments”, and
- “ecological structure and functions needed to maintain the viability of priority biodiversity”

These two categories are considered upon completion of assessment against criteria 1-5 above.

2.1.5 Identification of Priority Biodiversity Features

Priority Biodiversity Features (PBFs) are sensitive biodiversity features that do not qualify as Critical Habitat. They are defined within PR6 and based on the following criteria:

- i) Threatened habitats.
 - a. Habitat type listed in Annex 1 of EU Habitats Directive or Resolution 4 of Bern Convention.
 - b. Ecosystem type with IUCN status of EN or CR.
- ii) Threatened species.
 - a. Species in the area of impact listed in Annex II of Habitats Directive, Annex I of Birds Directive or Resolution 6 of Bern Convention.
 - b. Species in the area of impact with IUCN global Red List status of VU, EN or CR.
 - c. Species in the area of impact with national or regional status of EN or CR.
- iii) Range-restricted species.
 - a. All range-restricted species in the area of impact.
- iv) Migratory and congregatory species
 - a. All migratory species in the area of impact.

PBF can also be identified against the two additional categories listed above.

2.1.6 Natural Habitat Identification

Classification of Natural Habitats (under PS6) relies upon a more qualitative approach, with areas defined as Natural Habitats being ‘...composed of viable assemblages of plant and/or

animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition.'

Given the more qualitative approach to defining Natural Habitat, the process can include consultation with relevant expert stakeholders. In the absence of quantitative thresholds, definition of Natural Habitat includes all necessary evidence/justification and considers the habitat value in isolation, together with the presence of viable species assemblages dependent on the functioning of that habitat when classifying an area as Natural Habitat.

Natural Habitats will be discussed alongside the CHA findings throughout this report.

2.1.7 Country-Specific Application

With regards PR6, it is important to note that its application has elements that are country/region specific, most notably the explicit alignment with EU Directives and various Conventions. Kazakhstan sits outside of the EU (and is not a candidate for EU membership), nor is it a signatory under the Bern Convention. The specific elements of PR6 regarding species/habitats listed under EU Directives and the Convention therefore do not apply here and are not considered any further within this report.

3.0 CRITICAL HABITAT ASSESSMENT

3.1 Data Sources

This CHA is based upon a range of data collected specifically to inform this study, as well as existing information collated from a wide range of published literature as detailed in **Table 3**. Much of this has been presented within the ESIA, which should be read alongside this report.

Table 3 Inventory of Data Sources

Data Source	Relevant Organisations	Details
IBAT Report	IBAT-alliance.org	Initial report generated in March 2023 and updated Proximity Report generated in October 2025. The reports identified a range of potential Critical Habitat triggers and nearby protected areas. Full report presented within Appendix C .
2025 Baseline Conditions report	WSP; in-country biodiversity support team	The Baseline Conditions report includes a desk study, 2024 and 2025 field survey reports (ACBK) and a 2021 Shu River ichthyofauna report, as well as summarising data from the 2023 Environment and Social Screening report (Mott MacDonald). This was reviewed as part of the overall biodiversity input to this Project, in particular to inform understanding of the biodiversity baseline.
2025 Potential Impact Assessment Report	ACBK	This provides further details and consideration of potential CH receptors, which have been reviewed to help inform the CHA.
Literature review	WSP; In-country biodiversity support team	A detailed literature review has been undertaken in support of the biodiversity input to the Project (including specifically

		this CHA). Referenced where used.
eBird	www.ebird.org	Online resource for global bird records.
IUCN Red List	www.iucnredlist.org	Online resource for species occurrence and global conservation status.

3.1.1 Expert Stakeholder Engagement

A vital part of the CHA process is engagement with, and ongoing involvement of, relevant external experts. Kazakhstan's national Birdlife International partner organisation, ACBK, have been engaged in collecting biodiversity data from the early stages of the project. The survey team involved in data collection comprises esteemed academics and those with abundant experience of Kazakh biodiversity.

3.2 Limitations

There are areas of the Aol that are difficult to survey because access is challenging and/or the health and safety of field researchers could be compromised.

During the ornithology surveys, access to some of the final turbine locations was limited by the remoteness of the site, topography, the capacity of the survey team and occasional extreme weather conditions, which prohibited full coverage during the winter months due to snow and flooding. Consequently, while the spatial extent of surveys from September 2024 to November 2025 inclusive aligns with Good International Industry Practice (GIIP), temporal coverage is short of the full standard hours required.

To address these limitations appropriately, a precautionary approach to assessment has been taken in places; this is referenced accordingly.

3.3 Candidate List of Biodiversity Receptors

This CHA focusses on biodiversity receptors identified during the baseline data collection process as present/potentially present within the Aol, with sources summarised in Table 3, which are considered to have the potential to trigger Critical Habitat or Natural Habitat. Receptors were screened against the various Critical Habitat criteria (see Table 2). Candidate receptors are listed in full within Appendix A, with justification provided for their inclusion or exclusion, accordingly.

3.3.1 Screening Summary

The above screening exercise identified 11 biodiversity values that will require further consideration as potential Critical Habitat triggers:

- Zhusandala State Reserved Zone – Protected Area
- Andasay State Reserved Zone – Protected Area
- Argali – Mammal
- Goitered Gazelle – Mammal
- *Tulipa regelli* – Plant
- *Tulipa biflora*- Plant
- *Arthropytum subufolium* - Plant

- *Schizothorax pseudosaiensis* – Fish
- Severtsoy's loach – Fish
- Ship Sturgeon – Fish
- Marbled polecat – Mammal

The following biodiversity values have been confirmed as meeting the requirements for Natural Habitat classification:

- Xerophytic rocky low mountains
- Outcrops of flat granite slabs
- Saxaul valley forests
- Surface water features
- Sagebrush and sagebrush deserts on gently undulating plains
- Gently sloping solonchak depressions

3.3.2 Determining the EAAA

Determining the EAAA varies depending on the biodiversity receptor. In the case of protected areas and those species associated with these areas, the EAAA generally extends to the protected area boundary. For other species/habitats, the extent of the EAAA has been influenced by factors such as known range or distribution, where available, prevailing habitat types and land uses and with the application of expert opinion, where, considered appropriate. In some instances, a necessarily broad and conservative EAAA has been estimated.

For resident species (including birds, other fauna and flora) a generic EAAA was defined for resident (terrestrial) species that reflects the relatively similar steppe/pasture habitat characteristics found across the project site and Area of Influence, within which these species' presence will be maintained. This 'resident species EAAA' extends around the Project (including OHL options) out to a distance of up to 5km, within the mapped similar habitat types (i.e., excluding habitats that the resident species will not rely upon in any meaningful way such as higher ground/crags and large waterbodies). A buffer distance of 5km is considered ecologically appropriate to account for movement of any highly-mobile resident bird species; in reality, the territories/range of most resident species will unlikely extend anywhere near 5km to support their continued occurrence here, and so in the absence of any further information this is recognised a precautionarily large area. Additionally, project impacts to all species outside of this distance are considered likely to be negligible. The Resident Species EAAA was ultimately used only for marbled polecat, following the screening exercise and is presented in **Figure 1 of Appendix B**.

For other species, whose habitat preferences fall outside of the Resident Species EAAA (for example particular Kazakhstan Red Book flora, migratory mammals, specific bird species territories), bespoke EAAAs are defined and present within the relevant assessment section from Section 3.3.2 onwards.

No EAAA has been identified for migratory birds due to the lack of a relevant IBA/KBA, terrestrial habitat or topographical feature that is utilised by migratory birds as part of the transit through the area (i.e. as would commonly be habitually used roosting sites, waterbodies, or where birds are 'funnelled' in increased numbers between areas of high ground). The nearest such site/area is the Zhusandala KBA, which is approximately 50km east of the nearest project

component (OHL option 2), and 80km east of the Project site. This approach aligns with updated EBRD Guidance Note 6 and associated similar guidance for wind energy projects⁴.

A number of watercourses (largely ephemeral) are present across the AoI, including some that drain into Lake Balkhash. Relevant aquatic species considered likely to occur in Lake Balkhash (and its catchment) are therefore included. None of the watercourses on the Project site drain into watercourses for which any sensitive biodiversity has been flagged as being potentially present and so these are not considered any further within this report.

3.3.1 Criterion 1/4: Highly threatened and/or unique ecosystems

No receptors potentially triggering Critical Habitat under Criterion 1/4 were identified for the Project.

3.3.2 Criterion 2/1: Habitat of significant importance to Critically Endangered and/or Endangered species

Seven receptors that potentially trigger Critical Habitat under Criterion 2/1 have been identified. These are assessed in order of taxa. All population information has been obtained from the IUCN Red List⁵ unless otherwise stated.

Table 4 Regel's tulip (*Tulipa regelii*)

Factor	Description
Species Conservation Status	IUCN EN (A3cd) KZ Red Book Category 1
Species EAAA	This species was recorded from approximately 16 locations, mainly slopes in the south-west of the Project site. The species is known to prefer slate and shale covered hillsides within shrub and pasture habitats. It requires reasonable sunlight and so prefers open areas within these habitats. On the basis, the EAAA extends across continuous areas of shrub and pasture across the site and wider area (see Figure 2).
Population Estimate in EAAA	Unknown but greater than 15 individuals that would trigger CH (see below), especially given at least 16 separate records for this species across the EAAA.
Global Population and Trend	The global population is considered to be between 3,000 and 5,000 mature individuals, and declining mainly due to threats from overgrazing, recreational pressures, reservoir flooding and climate change.
Assessment	Based on field surveys, the numbers of this species across the EAAA is in excess of 15 individuals and therefore meeting the 0.5% population level threshold for Critical Habitat classification. The EAAA for this species therefore is classified as Critical Habitat under Criterion 2/1a.

⁴ EBRD. 2025. Briefing Note: *Managing Risks of Wind Power Plants to Birds and Bats*. Unpublished.

⁵ accessed at www.iucnredlist.org

Table 5 Two-flowered tulip (*Tulipa biflora*)

Factor	Description
Species Conservation Status	IUCN LC KZ Red Book Category 1
Species EAAA	This species was recorded from across the open wormwood and <i>Salsola</i> sp. shrub habitat across the Project site. Like <i>T. regelii</i> , this species is known to prefer open hillsides within shrub and pasture habitats. It requires direct sunlight and so prefers open areas within these habitats. On the basis, the same EAAA as for <i>T. regelii</i> is used here (see Figure 2).
Population Estimate in EAAA	Unknown
Global Population and Trend	The estimated global population is far in excess of 100,000, with over 50,000 mature individuals estimated in Kazakhstan. The species is found in Kazakhstan, Uzbekistan, Kyrgyzstan and Tajikistan, in the western Tien Shan and Pamir-Alai regions. It is declining across its range and susceptible to the effects of climate change.
Assessment	Based on field survey records, the EAAA population has the potential to be in the thousands (based on densities of up 11/m ² in stands covering 100m), and so likely to be in excess of 500 plants which would represent a conservative estimate of what 0.5% of the global population would comprise. On this basis the EAAA does qualify as Critical Habitat for this species under Criterion 2/1c.

Table 6 Marbled polecat (*Vormela peregusna*)

Factor	Description
Species Conservation Status	IUCN VU (A2c) KZ Red Book
Species EAAA	This species inhabits steppe, open desert, semi-desert, shrubland and semi-arid rocky areas in upland valleys and low hill ranges. Although its range overlaps the project site, it was not observed directly during surveys. EAAA constitutes the suitable habitat types in and within 5km of the project site (aligned with the Resident Species EAAA – Figure 1).
Population Estimate in EAAA	0-10 mature individuals
Global Population and Trend	The global population is unknown, but assessed as decreasing (at least a 30% reduction in the population between 2006 and 2016) by IUCN due to loss of steppe habitat. Range stretches from Bulgaria east to China, as far north as the Kazakh/Russian border and as far south as Egypt.
Assessment	Lack of signs or sightings during baseline surveys suggests no significant population or concentration and

	<p>therefore no chance of project-related losses within the EAAA that would result in a change to EN/CR.</p> <p>Therefore, the EAAA for this species does not qualify as Critical Habitat under Criterion 2/1c. Due to presence of suitable habitats, this species is considered to be a PBF on a precautionary basis.</p>
--	---

Table 7 Goitered gazelle (*Gazella subgutturosa*)

Factor	Description
Species Conservation Status	IUCN VU (A2acd) KZ Red Book Category III
Species EAAA	This species occupies a wide range of semi-desert and desert habitats include hills and valleys up to 2,700m asl. The species makes seasonal movements to find pasture and water, and to avoid heavy snowfall. The EAAA is considered to extend across the continuous extents of pasture habitat across the site and wider area. See Figure 3 .
Population Estimate in EAAA	0-10 mature individuals
Global Population and Trend	The global population is estimated at 42,000-49,000 individuals, and declining. The main threat to the species is thought to be illegal hunting and habitat loss.
Assessment	Minimal signs or sightings during baseline surveys suggests no significant population or concentration and therefore no chance that the loss of the EAAA population would result in a change to EN/CR. Therefore, the EAAA for this species does not qualify as Critical Habitat under Criterion 2/1c. However, given the species' VU status, it qualifies as PBF.

Table 8 Ship sturgeon (*Acipenser nudiiventris*)

Factor	Description
Species Conservation Status	IUCN CR (A2cde) KZ Red Book Category I
Species EAAA	This species occurs within Lake Balkhash and Lli River catchment following introduction from the Aral Sea in the early 20 th Century. The EAAA therefore extends across Lake Balkhash and Lli River in line with its known extent within this catchment (see Figure 4).
Population Estimate in EAAA	Unknown
Global Population and Trend	The global population is estimated at 100 individuals, and declining, although this doesn't officially include the introduced Lake Balkhash population. The main threat to the species is thought to be illegal hunting and habitat loss.
Assessment	Although the EAAA population is an introduced one, given its naturalised nature (it has been self-sustaining

	within Lake Balkhash and Lli River for nearly 100 years), it is considered appropriate to include as a legitimate population for the purposes of this CHA. The overall low global populations means that any sustained population in the EAA will be globally significant and therefore meets the requirements of Criterion 2/1a. The EAAA is therefore considered to be Critical Habitat under Criterion 2/1a.
--	--

Table 9 Severtsoy's loach (*Triplophysa sewerzowi*)

Factor	Description
Species Conservation Status	IUCN VU (B2ab)
Species EAAA	This species occurs in lakes and slow-moving rivers with sandy bottoms. It occurs within the Lake Balkhash basin and east to the Lake Alako basin. The EAAA is considered to extend across the Lake Balkhash basin (see Figure 5).
Population Estimate in EAAA	Unknown
Global Population and Trend	The global population is declining, with a local population extinction reported in 2000 and the Lli River also considered close to extinction. The main threat to the species is thought to be changes to water regimes and invasive species introductions.
Assessment	Given the very limited Area of Occupancy (AOO) for this species and known trend of population decline, it is reasonable to assume that further losses of this species from the Lake Balkhash EAAA would result in its status being changed to EN/CR. The EAAA for this species therefore qualifies as Critical Habitat under Criterion 2/1b.

Table 10 Fish sp. (*Schizothorax pseudoaksaiensis*)

Factor	Description
Species Conservation Status	IUCN VU (B2ab)
Species EAAA	This species occupies a wide range of habitats including fast-flowing rivers and lakes, including Lake Balkhash and its tributaries which it may now be absent from. The EAAA is considered to extend across Lake Balkhash and its tributaries, on a precautionary basis (see Figure 5).
Population Estimate in EAAA	Unknown
Global Population and Trend	The global population is unknown but considered stable. There has been a recent decline follow likely extinction from Lake Balkhash as a result of overfishing and introduction of invasive species.
Assessment	Given that Lake Balkhash potentially no longer supports a population of this species, it is not considered reasonable to assume that any further losses here

would result in the IUCN Red List status changing to EN/CR. **Therefore, the EAAA for this species does not qualify as Critical Habitat under Criterion 2/1c.** Given the local extinction the species can also not be considered to be a PBF.

3.3.3 Criterion 3/2: Habitats of significant importance to endemic or geographically restricted species

Two receptors potentially triggering Critical Habitat under Criterion 3/2 have been identified for the Project.

Table 11 Regel's tulip (*Tulipa regelii*)

Factor	Description
Species Conservation Status	IUCN EN (A3cd) KZ Red Book
Species EAAA	This species was recorded from approximately 16 locations, mainly slopes in the south-west of the Project site. The species is known to prefer slate and shale covered hillsides within shrub and pasture habitats. It requires reasonable sunlight and so prefers open areas within these habitats. On the basis, the EAAA extends across continuous areas of shrub and pasture across the site and wider area (see Figure 2).
Population Estimate in EAAA	Unknown, assumed >300 based on there being at least 16 separate occurrences.
Extent of Occurrence (EOO)	15,143km ²
Global Population and Trend	The estimated global population is between 3,000-5,000 mature individuals, known from 10 locations, all within Kazakhstan.
Assessment	On a precautionary basis, the numbers of this species across the EAAA will be in excess of 300 individuals and therefore meeting the 10% population level threshold for Critical Habitat classification under Criterion 3/2.

Table 12 Arthrophytum subufolium

Factor	Description
Species Conservation Status	Endemic/Range-restricted KZ Red Book Category 3
Species EAAA	This species was recorded during field surveys. The species has similar xerophytic habitat preferences to other ed book flora. On this basis, the EAAA extends across continuous areas of open shrub and pasture across the site and wider area (see Figure 6).
Population Estimate in EAAA	Unknown, assumed extent on the site is <1km ² based upon field botanist estimates, and when applying a precautionary plant density for other Central Asian desert shrubs of ~one plant per 2m ² this would give a maximum number of 500 plants.
Extent of Occurrence (EOO)	Assumed <50,000km ² based on published literature which describes its presence being confined to 'a range rows in a narrow region of the Chu-Ili Range in Kazakhstan (Osmanali et al. 2019 in Kubentayev <i>et al.</i>

	2024 ⁶). This is estimated to be in the region of 1,000km ² .
Global Population and Trend	Unknown, although on the basis of the above plant density assumptions, an estimate of ~500,000 plants is presented.
Assessment	The precautionary numbers presented here suggest it is very unlikely that EAAA plant numbers for this species would meet the 10% threshold for classification as Critical Habitat under Criterion 3/2. This species is therefore not considered a Critical Habitat trigger, but is a PBF.

3.3.4 Criterion 4/3: Habitats supporting globally significant migratory or congregatory species

The Project site is not located within an area of significant importance for migratory birds, with no recorded connectivity with KBAs/IBAs in the wider area (the nearest such example being approximately 50km from the nearest Project component), and no migratory (or congregatory) birds have been screened in for further assessment (as Critical Habitat) in this report.

Two non-avian receptors that potentially trigger Critical Habitat under Criterion 4/3 has been identified. This is assessed below.

Table 13 Argali (Ovis ammon)

Factor	Description
Species Conservation Status	IUCN NT (A2de) KZ Red Book Category II
Species EAAA	Herds of up to circa 20 argali were recorded by seven camera traps in and around the Project Site during baseline surveys. The species migrates but was found using the hills in and around the Project site year-round. A precautionary EAAA, broadly based on the species' known movement patterns (Fedosenko and Kapitonov, 1983 ⁷ ; Berber, 2007 ⁸) which extends for 30km from recorded sightings is considered appropriate, to allow for seasonal movement of animals in response to weather conditions and food availability See Figure 3 .
Population Estimate in EAAA	Given the extent of surveys, it isn't expected that numbers are significantly more than those that were recorded. A precautionary estimate of 100 is presented here.
Global Population and Trend	The global population is estimated at 80,000-90,000 individuals and declining, with the Kazakh population

⁶ Kubentayev, S. A., Alibekov, D. T., Perezhogin, Y. V., Lazkov, G. A., Kupriyanov, A. N., Ebel, A. L., Izbastina, K. S., Borodulina, O. V., Kubentayeva, B. B. 2024. Revised checklist of endemic vascular plants of Kazakhstan, Phytokeys, Volume 238, 2024, Pages 241-279

⁷ Fedosenko A.K., Kapitonov V.I. (1983). Argali – Ovis ammon. In: Mammals of Kazakhstan. Vol. 3, part 3. 144-208. (in Russian)

⁸ Berber A.I. 2007. The Argali (Ovis a. ammon) of Kazakh tableland. Karagandy: Printing house TAIS. 168 pp. (in Russian)

	declining rapidly. Threats include hunting, competition with livestock farming, mining and invasive species.
Assessment	Low number of sightings during baseline surveys suggests it is unlikely to be present in CH triggering numbers. In addition, the site elevation sits at the lower end of the species' preference in this regard (stated as 400m ⁹), which likely will influence density of animals here.

Table 14 Goitered gazelle (*Gazella subgutturosa*)

Factor	Description
Species Conservation Status	IUCN VU (A2acd) KZ Red Book Category III
Species EAAA	This species occupies a wide range of semi-desert and desert habitats include hills and valleys up to 2,700m asl. The species makes seasonal movements to find pasture and water, and to avoid heavy snowfall. The EAAA is considered to mirror that described for argali. See Figure 3 .
Population Estimate in EAAA	0-10 mature individuals
Global Population and Trend	The global population is estimated at 42,000-49,000 individuals, and declining. The main threat to the species is thought to be illegal hunting and habitat loss.
Assessment	Minimal signs or sightings during baseline surveys suggests no significant population or concentration and therefore no chance that the threshold for classification under Criterion 4/3 would be reached.

3.3.5 Criterion 5: Areas associated with key evolutionary processes

This criterion includes presence of areas with landscape features that might be associated with evolutionary processes or species populations that are especially distinct and may be of special conservation concern given their distinct evolutionary history was considered.

The Study Area is not known to contain landscape features that may influence evolutionary processes, giving rise to regional configurations of species and ecological properties. In fact, no species and/or subpopulations of species is characterized by a particular level of isolation, spatial heterogeneity, and wealth of environmental gradients or edaphic interfaces. Moreover, the area is not considered to be of demonstrated importance as to climate change adaptation. These considerations suggest that the study area does not support any key evolutionary process.

Therefore, no Critical Habitat is expected to be present in the Study Area according to this criterion.

⁹ Reading, R., Michel, S. & Amgalanbaatar, S. 2020. *Ovis ammon*. *The IUCN Red List of Threatened Species* 2020: e.T15733A22146397. <https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T15733A22146397.en>. Accessed on 19 December 2025.

3.3.6 Significant biodiversity features identified by a broad set of stakeholders or governments

PR6 requires consideration of features identified by a broad set of stakeholders or governments as PBF, and for this Project, two protected areas have been screened in, based on proximity to the Site and the potential for effect pathways to be present here. These are as follows (see **Figure 7**):

- Zhusandala State Reserved Zone (IUCN Management Category VI) (Protected Planet Site ID 555705874: The Site has an area of 27,570 km² and is a managed reserve area. The reserve was designated in 2001 and is state-owned¹⁰. It contains terrestrial and freshwater habitats and is primarily protected for its avian species especially the Asian houbara. The Reserved Zone comprises of grassland (95.65%), shrubland (3.89%) and bare areas (0.4%) as well as 231 species of birds and 56 species of mammals.
- Andasay State Nature Reserve (IUCN Management Category IV) (Protected Planet Site ID: 62582): The Site has an area of 10000 km² and was designated in 2001 and is state-owned¹¹. It contains terrestrial and freshwater habitats. Its designation is primarily for the preservation and restoration of rare bird species but it is also an important area for kulan, argali, saiga, gazelle and wild boar. The total landcover comprise of 83.24% grassland, 8.27% wetland and 5.16% bare areas. A total of 175 bird species and 45 mammal species have been recorded within the site.

Neither of these protected areas are of an IUCN Management Category that would infer highest levels of conservation importance, although IUCN Management Category IV does suggest a level of importance in the habitat/species assemblage that is worthy of management. Therefore, neither site is considered to qualify as Critical Habitat. However, both sites qualify as PBF.

Additionally, the significance of argali sheep to various Kazakh stakeholder groups, from both an ecological and cultural perspective is recognised, and while the population present within the AoI is not of high national importance (from a purely numerical position), it is considered of sufficient value to be classified a PBF under this criterion.

3.3.7 Ecological structure and functions needed to maintain the viability of priority biodiversity features

No features are included under this category.

3.4 Priority Biodiversity Features

As referenced (where relevant) within the assessment tables above, some features screened in did not meet the threshold for CH but will be PBF. In addition, a number of other receptors that were not screened in will also be PBF by virtue of explicit criteria (e.g., IUCN VU status, migratory species, endemic species.). A total of 37 specific PBF have been identified, together with an additional grouped receptor – migratory birds.

¹⁰ UNEP-WCMC (2025). Protected Area Profile for Zhusandala State Reserved Zone from the World Database on Protected Areas, December 2025

¹¹ UNEP-WCMC (2025). Protected Area Profile for Andasay State Nature Sanctuary (zoological) from the World Database on Protected Areas, December 2025.

3.5 Natural Habitats

The following habitats are considered to meet the requirements of classification as Natural Habitat (as per PR6), with justification provided:

- Xerophytic rocky low mountains;
- Outcrops of flat granite slabs;
- Saxual valley forests;
- Surface water features
- Sagebrush and sagebrush deserts on gently undulating plains; and
- Gently sloping solonchak depressions on the plains.

These habitats are substantially unmodified and their characteristics such as faunal make-up indicate that they should be regarded as Natural Habitat, in accordance with PR6. Whilst habitats may have experienced some grazing pressure it is assessed as not having been sufficient to modify the habitat characteristics away from a natural state.

4.0 CONCLUSIONS

4.1.1 Critical Habitat

In summary, based on our current understanding of the Project Aol and information gathered through available literature and in field investigations, together with application of the precautionary principle, the following biodiversity features are considered to trigger Critical Habitat for the associated EAAA:

- *Tulipa regelli*
- *T. biflora*
- Severtsoy's loach
- Ship Sturgeon

4.1.2 Priority Biodiversity Features

The following biodiversity values, considered in this assessment, are considered to be PBFs:

- Zhusandala State Reserved Zone
- Andasay State Reserved Zone
- Argali
- *Schizothorax pseudoksaiensis*
- Goitered gazelle
- Marbled polecat
- *Tulipa biflora*

A further 18 PBFs have been identified through the screening exercise and are listed in full in the screening table (**Appendix A**). The 18 features comprise of 17 bird species/groups; and one herptile.

4.1.3 Natural Habitat

The following biodiversity values are considered to trigger Natural Habitat:

- Xerophytic rocky low mountains
- Outcrops of flat granite slabs
- Saxaul valley forests
- Surface water features
- Sagebrush and sagebrush deserts on gently undulating plains
- Gently sloping solonchak depressions

BIBLIOGRAPHY

Scottish Natural Heritage (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms V2.

Avistep - The Avian Sensitivity Mapping Tool for Energy Planning – by Bird Life International.
<https://avistep.birdlife.org/>

Bird Life International: <https://www.birdlife.org/>

Terrestrial Ecoregions of the World (TEOW): <https://www.worldwildlife.org/publications/terrestrial-ecoregions-of-the-world>.

Freshwater ecoregions of the world (FEOW): <https://www.feow.org>.

IUCN Red List of Threatened Species: <https://www.iucnredlist.org>.

Key Biodiversity Areas: <http://www.keybiodiversityareas.org/home>.

Plants of the World: <http://www.plantsoftheworldonline.org/>

World Database on Protected Areas (WDPA): <https://www.protectedplanet.net/en>.

IBAT (Integrated Biodiversity Assessment Tool): <https://www.ibat-alliance.org>

GBIF (Global Biodiversity Information Facility): <https://www.gbif.org/>.

Red Data Book of the Republic of Kazakhstan [The Red List of Republic of Kazakhstan](#)

CABI. 2017. Invasive Species Compendium. CAB International, Wallingford, UK. Available from: www.cabi.org/isc.

APPENDIX A – SCREENING TABLE

Biodiversity Value	Common Name	Scientific Name	Screening source	IUCN RL Status (CR/EN/VU)	Red Book of Kazakhstan status	Endemic / Restricted Range	Migratory / Congregatory	Screening Comments	Screened In/Out	Assessment Category	Natural Habitat	PBF
Protected Area	Andasay State Nature Sanctuary (zoological)		Desk study	-	-	-	-	Protected Site is within 5km	In	Significant biodiversity feature		Y
Protected Area	Zhusandala State Reserved Zone		Desk study	-	-	-	-	Protected Site is within 5km	In	Significant biodiversity feature		Y
Protected Area	Ili River Delta and South Lake Balkash		Desk study	-	-	-	-	Site is within 25kms; screened out due to distance from site.	Out			
Protected Area	Pribalkhash State Nature Sanctuary (complex)		Desk study	-	-	-	-	Site is within 25kms; screened out due to distance from site.	Out			
Protected Area	Zhusandala Important Bird Area		Desk study	-	-	-	-	Site is within 50kms; screened out due to distance from site	Out			
Protected Area	Ili River Delta and South Lake Balkash Ramsar site		Desk study	-	-	-	-	Site is within 50kms; screened out due to distance from site	Out			
Key Biodiversity Area	Ili River Delta		Desk study	-	-	-	-	Site is within 50kms; screened out due to distance from site	Out			
Key Biodiversity Area	Tulek Valley		Desk study	-	-	-	-	Site is within 50kms; screened out due to distance from site	Out			
Key Biodiversity Area	Topar Lake System		Desk study	-	-	-	-	Site is within 50kms; screened out due to distance from site	Out			
Key Biodiversity Area	Zhusandala		Desk study	-	-	-	-	Site is within 50kms; screened out due to distance from site	Out			
Habitats	Water		Desk study / field survey	-	-	-	-	Not an IUCN CR/EN ecosystem type, or high priority for conservation at regional/national level. Assumed Natural Habitat	Out		Y	
Habitats	Flooded vegetation		Desk study / field survey	-	-	-	-	Not an IUCN CR/EN ecosystem type, or high priority for conservation at regional/national level. Assumed Natural Habitat	Out		Y	
Habitats	Crops		Desk study / field survey	-	-	-	-	Not an IUCN CR/EN ecosystem type, or high priority for conservation at regional/national level. Assumed Natural Habitat	Out		Y	
Habitats	Bare ground		Desk study / field survey	-	-	-	-	Not an IUCN CR/EN ecosystem type, or high priority for conservation at regional/national level. Assumed Natural Habitat	Out		Y	
Habitats	Rangeland		Desk study / field survey	-	-	-	-	Not an IUCN CR/EN ecosystem type, or high priority for conservation at regional/national level.	Out		Y	

								Assumed Natural Habitat				
Birds	Asian houbara	<i>Chlamydotis macqueenii</i>	Desk study	-VU	Yes - Category 2	-	Yes	Global population is ~80000-100000 (MIs). KZ Population is ~49000. Peak numbers of birds recorded on site was three individuals and therefore not feasibly sufficient to trigger Critical Habitat.	Out			Y
Birds	Barbary falcon	<i>Falco peregrinus pelegrioides</i>	Field survey	-	Yes - Category 1	-	Yes	Global population is 5000-10000. Kz population: no data but considered locally common. Not observed during surveys and therefore screened out.	Out			
Birds	Booted eagle	<i>Hieraaetus pennatus</i>	Desk study	-	Yes - Category 3	-	Yes	Global population 150000 - 195,000. Kz population not known but noted as having sparse breeding population in western forests. Present in Aol in low numbers only and below any potential CH trigger levels.	Out			
Birds	Black-bellied sandgrouse	<i>Syrrhaptes paradoxus</i>	Desk study / field survey	-	Yes - Category 3	-	Yes	Global population 130000 -260000. Kz population is 500 -600. Present in Aol in low numbers only and below any CH trigger levels.	Out			Y
Birds	Broad-billed sandpiper	<i>Calidris falcinellus</i>	Desk study	-VU	-	-	-	Global Population is 96,000 - 136,000. Kz population is not known. None observed during field surveys.	Out			
Birds	Common crane	<i>Grus grus</i>	Desk study	-	Yes - Category 3	-	Yes	Global population 718160 - 858240. Kz population is estimated to be in low hundreds. Present in Aol in low numbers only, and nowhere near what would be required to trigger CH as a migratory species.	Out			Y
Birds	Common pochard	<i>Aythya ferina</i>	Desk study	-VU	-	-	Yes	Global population is 760,000 and 2,500,000. Kz population is unknown. Not observed during site surveys.	Out			
Birds	Curlew sandpiper	<i>Calidris ferruginea</i>	Desk study	-VU	-	-	-	Global population is 420,000 and 960,000. Kz population is not known. Not observed during field surveys.	Out			

Birds	Demoiselle crane	<i>Anthropoides virgo</i>	Desk study	-	Yes - Category 3	-	Yes	Global population is 200000-216000. Kz population may peak at 80,000. Present in Aol in low numbers only and nowhere near what would be required to trigger CH as a migratory species.	Out			
Birds	Eastern imperial eagle	<i>Aquila heliaca</i>	Desk study / field survey	-VU	Yes - Category 3	-	Yes	Global population is 8,099 and 9,981 breeding pairs. Kz population is 3420-4260 breeding pairs. Recorded within Aol, but only a single bird recorded and therefore not considered feasibly at numbers to trigger CH.	Out			Y
Birds	Egyptian vulture	<i>Neophron percnopterus</i>	Desk study	-EN	Yes - Category 3	-	Yes	Global population is 12,400 and 36,000. Kz population is 418- 502 breeding pairs. Not recorded during field surveys.	Out			
Birds	Eurasian spoonbill	<i>Platalea leucorodia</i>	Desk study	-	Yes - Category 2	-	Yes	Global population 79250 - 95850. Kz population is unknown, but the species is not considered at risk. Not observed during surveys.	Out			
Birds	European turtle-dove	<i>Streptopelia turtur</i>	Desk study	-VU	-	-	Yes	Global population is 12,800,000 and 47,600,000. Kz population is not known. Not observed during field surveys.	Out			
Birds	Ferruginous duck	<i>Aythya nyroca</i>	Desk study	-	Yes - Category 3	-	Yes	Global population 180000 - 240000. Kz population 6000-7000 BPs. Not observed during field surveys.	Out			
Birds	Glossy ibis	<i>Plegadis falcinellus</i>	Desk study	-	Yes - Category 2	-	Yes	Global population is 178500 - 3800000. Kz population 230000 - 2220000. Not observed during field surveys, so if present within the , assumed to be in small numbers only.	Out			
Birds	Golden eagle	<i>Aquila chrysaetos</i>	Desk study / field survey	-	Yes - Category 3	-	Yes	Global population 85000 - 160000. Kz population 434 - 645 BPs. Present in the Aol in low numbers only (including breeding birds) and nowhere near what would be required to trigger CH as a migratory species.	Out			

Birds	Great bustard	<i>Otis tarda</i>	Desk study / field survey	-EN	Yes - Category 1	-	Yes	Global population is 29,060 and 32,449. Kz population is 150 to 500. Present in Aol in low numbers only and below any CH trigger levels.	Out			Y
Birds	Great white pelican	<i>Pelecanus onocrotalus</i>	Desk study / field survey	-	Yes - Category 1	-	Yes	Global population is 260,000 and 300,000. Kz population is ~4000 breeding pairs. Observed in during field surveys but at very low numbers, well below meeting CH triggering thresholds.	Out			Y
Birds	Greater spotted eagle	<i>Clanga clanga</i>	Desk study	-VU	-	-	Yes	Global population is 3,900 and 10,000. Kz population is 600 breeding pairs. Recorded during field surveys but at very low numbers, with no possibility of triggering Critical Habitat thresholds for a VU or migratory species.	Out			Y
Birds	Grey plover	<i>Pluvialis squatarola</i>	Desk study	-VU	-	-	-	Global population is 1,250,000 and 2,250,000. Kz population is not known. Not recorded during field surveys.	Out			
Birds	Ibisbill	<i>Ibidorhyncha struthersii</i>	Desk study	-	Yes - Category 2	-	-	Global population is unknown. Kz population 80 breeding pairs. Not recorded during field surveys and habitats within Aol are sub-optimal.	Out			
Birds	Little bustard	<i>Tetrax tetrax</i>	Desk study / field survey	-VU	Yes - Category 2	-	Yes	Global population 122000-240000. Kz population ~210000. Recorded during filed surveys but at low numbers, nowhere near those required to trigger CH for a migratory or VU species.	Out			Y
Birds	Osprey	<i>Pandion haliaetus</i>	Desk study	-	Yes - Category 1	-	Yes	Global Population is between 137,000 and 200,000. This species was recorded during field surveys but in low numbers, nowhere near levels that might trigger CH for threatened or migratory species.	Out			Y
Birds	Pallas's fish-eagle	<i>Haliaeetus leucoryphus</i>	Desk study / field survey	-EN	Yes - Category 1	-	Yes	Global population is <2500. Kz population is unknown. Not observed during field surveys.	Out			

Birds	Peregrine falcon	<i>Falco peregrinus</i>	Desk study	-	Yes - Category 1	-	Yes	Global population is 248,000 to 478,000. Kz population is probably low hundreds and is being supplemented by releases. Not observed during field surveys.	Out			
Birds	Pin-tailed sandgrouse	<i>Pterocles alchata</i>	Desk study / field survey	-	Yes - Category 3	-	Yes	Global population 130000-1500000. Kz population is not known. Present in Aol in low numbers, with no possibility of reaching CH triggering threshold for migratory species.	Out			Y
Birds	Rustic bunting	<i>Emberiza rustica</i>	Desk study	-VU	-	-	Yes	Global population is 4,200,000 and 8,200,000. Kz population is not known. None observed during surveys and only one record known from the region.	Out			
Birds	Saker falcon	<i>Falco cherrug</i>	Desk study / field survey	-EN	Yes - Category 1	-	Yes	Global population is 6,100 and 14,900 BPs. Kz population is low hundreds but is being supplemented by releases. Two pairs recorded within the study area, but outside of the Aol, with no suggestion of regularly used areas present within the Aol.	Out			Y
Birds	Sociable lapwing	<i>Vanellus gregarius</i>	Desk study	CR	-	-	Yes	Global population is 15,000 and 17,000. Kz population is 200-600 breeding pairs, mainly in the north of the country. No records were made from field surveys.	Out			
Birds	Steppe eagle	<i>Aquila nipalensis</i>	Desk study / field survey	-EN	Yes - Category 5	-	Yes	Global population is between 50,000 and 75,000. Kz population is 22,000 to 32,000 breeding pairs - a significant proportion of the global population. Steppe eagle are known to nest outside of the Aol, in the wider area and were observed throughout field surveys (including migratory and resident birds), but in single numbers (i.e. no large migratory flocks and outside the core range for resident pairs); and not anywhere near numbers requiring further assessment in	Out			Y

								terms of meeting CH trigger thresholds for threatened species (under Criterion 2/1). Given the lack of migratory movement that would qualify for consideration under Criterion 4/3 (i.e. linked to important stopover sites or topographical features), the species isn't considered under this criterion either.				
Birds	White-headed duck	<i>Oxyura leucocephala</i>	Desk study	-EN	Yes - Category 1	-	Yes	Global population is 10000. Kz population has counts of ~20000 individuals (which is at odds with the global population estimate). Not observed during field surveys.	Out			
Birds	White stork (asiatica, Severtzov 1873)	<i>Ciconia ciconia asiatica</i>	Desk study	-	Yes - Category 1	-	Yes	Global population is 330,000 and 704,000 BPs. Kz population is 59 breeding pairs. Not observed during field surveys and no records of the species from within the Aol (based on ACBK intelligence).	Out			
Birds	White-tailed sea-eagle	<i>Haliaeetus albicilla</i>	Desk study / field survey	-	Yes - Category 2	-	Yes	Global population 28200 - 54800. Kz population 120-130 breeding pairs. Present in Aol in low/single numbers only, nowhere near the levels required for CH consideration as a migratory species.	Out			Y
Birds	Whooper swan	<i>Cygnus cygnus</i>	Desk study / field survey	-	Yes - Category 2	-	Yes	Global population ~ 264400. Kz population <1000 BPs. Present in Aol in small numbers only, and nowhere near those required for consideration as CH for migratory species.	Out			Y
Birds	Yellow-eyed pigeon	<i>Columba eversmanni</i>	Desk study / field survey	-VU	Yes - Category 3	-	Yes	Global population is 10000 - 30000. Kz population is not known. Not observed during field surveys.	Out			
Birds	Migratory birds							A wide-range of migratory birds are known to use the airspace above the site but in very small numbers, that would not meet thresholds for Critical Habitat classification. 259 migrants were identified from within				Y

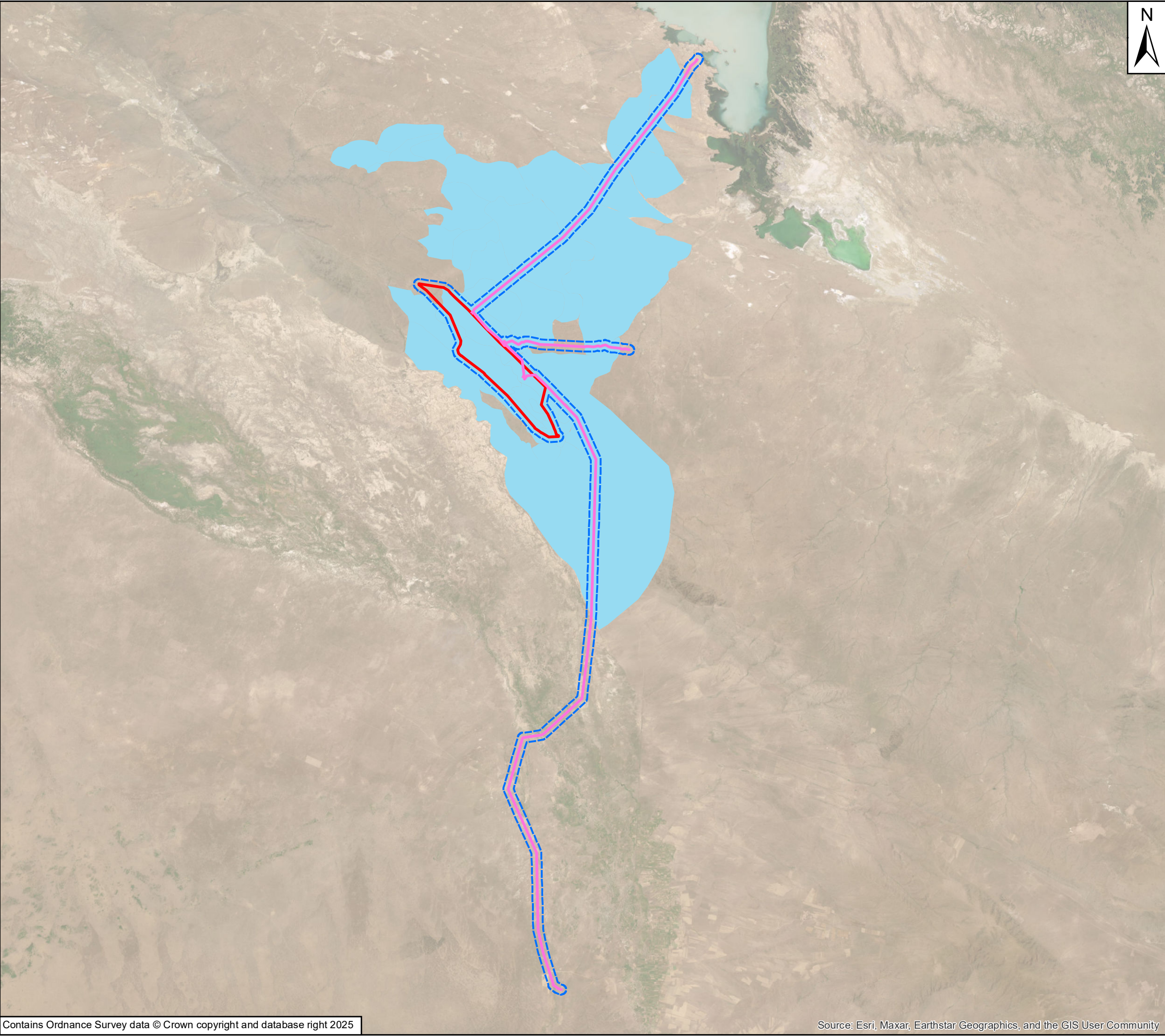
								the IBAT Report 50km proximity report, and those most relevant to this study are considered separately above. However, given PR6's 'catch all' for migratory species as PBF, a migratory bird PBF is identified.				
Mammals	Argali	<i>Ovis ammon</i>	Desk study / field survey	-	Yes - Category 3	-	-	Global Population 80000 - 90000. Kz population ~14000. Maximum number moving through site ~20. Not at levels which would trigger CH for population level criteria; however, given cultural significance of this species, it is considered appropriate to fully assess this species and so it has been screened in for assessment as a migratory species and due to its importance to stakeholders.	In	4/3		
Mammals	Bobrinski's serotine	<i>Eptesicus bobrinskoi</i>	Desk study	-	Yes - Category 3	-	-	Global population is unknown but significant proportion believed to be in Kz. Not identified during field surveys	Out			
Mammals	Common hamster	<i>Cricetus cricetus</i>	Desk study	CR	-	-	-	Population numbers are unknown but suffering catastrophic decline with extinction possible in less than 30 years. Not identified in AoI, including lack of any burrows.	Out			
Mammals	European free-tailed bat	<i>Tadarida teniotis</i>	Desk study	-	Yes - Category 1	-	-	Global population is unknown. Kz population is not known. Not identified during field surveys.	Out			
Mammals	Goitered gazelle	<i>Gazella subgutturosa</i>	Desk study / field survey	-VU	Yes - Category 3	-	-	Global population is between 120,000 and 140,000. Kz population is not known. Herds recorded in the Site Area.	In	Criterion 2/1b		Y
Mammals	Kulan	<i>Equus hemionus ssp. kulan</i>	Desk study	-EN	-	-	Yes	Global population is 55000. Kz population is 4600. Not recorded during field surveys.	Out			
Mammals	Marbled polecat	<i>Vormela peregusna</i>	Desk study	-VU	Yes - Category 3.	-	-	No field survey records; however the species is notoriously difficult to record and has a wide range of habitat preferences and distribution; therefore,	In	Criterion 21/b		Y

								precautionarily screened in.				
Mammals	Saiga	<i>Saiga tatarica</i>	Desk study	-	Yes	-	Yes	Not recorded during field surveys and not known for the area.	Out			
Fishes	Bulatmai barbel	<i>Luciobarbus capito</i>	Desk study	-VU	-	-	Yes	Not recorded during surveys	Out			
Fishes	Chu sharpray	<i>Capoetobrama kuschakewitschi</i>	Desk study	-EN	Yes - Category 3	-	-	No longer occurs in catchment	Out			
Fishes	Ship sturgeon	<i>Acipenser nudiiventris</i>	Desk study	CR	Yes - Category 1	-	-	Occurs in Lake Balkhash; 2 OHL options that lead to this Lake	In	Criterion 2/1a&c		Y
Fishes	Plain thicklin loach	<i>Triplophysa labiata</i>	Desk study	-VU	-	-	-	Does not occur in Aol catchments	Out			
Fishes	Severtsoy's loach	<i>Triplophysa sewerzowi</i>	Desk study	-VU	-	-	-	Occurs in Lake Balkhash catchment; 2 OHL options that lead to this Lake	In	Criterion 2/1b		Y
Fishes	-	<i>Schizothorax pseudoaksaiensis</i>	Desk study	-VU	-	-	-	Potentially occurs in Lake Balkhash; 2 OHL options that lead to this Lake	In	Criterion 2/1b		Y
Fishes	-	<i>Schizothorax rgentatus</i>	Desk study	-VU	Yes	-	Yes	No longer occurs in catchment	Out			
Plants	Albert's tulip	<i>Tulipa alberti</i>	Field survey	-	Yes - Category 2	Yes	-	Population status is not known but significant proportion in Kz especially around Lake Balkhash. Present in Aol. EOO >50000km ² (323,598km ²) and not Cat 1	Out			
Plants	Bema tulip	<i>Tulipa behmiana</i>	Field survey	-	-	Yes	-	Considered synonym of <i>T. lehmanniana</i> which is a fairly wide-ranging endemic with population extending into the millions	Out			
Plants	Black saxaul	<i>Haloxylon aphyllum</i>	Field survey	-	Yes - Category 3	-	-	Considered synonym of variety of <i>H. ammodendron</i> which has EOO of far in excess of 50,000km ²	Out			
Plants	Borshchov's tulip	<i>Tulipa borszczowii</i>	Field survey	-	Yes - Category 2	Yes	-	Species EOO>50000km ² (308827km ²) and is not Kz Red Book Category 1. Therefore, screened out.	Out			
Plants	Greig's tulip	<i>Tulipa greigii</i>	Field survey	-	Yes - Category 3	Yes	-	Species EOO>50000km ² (194758km ²) and is not Kz Red Book Category 1. Therefore, screened out.	Out			
Plants	Jerusalem sage	<i>Phlomoideis septentrionalis</i>	Desk study	-	Yes - Category 3	Yes	-	Central Asian species - population information unavailable. Not recorded during field surveys.	Out			





Plants	Regel's tulip	<i>Tulipa regelii</i>	Desk study / field survey	-EN	Yes - Category 2	Yes	-	Endemic and documented in Chu-Ili Mountains. Recorded in significant numbers during field surveys.	In	Criterion 2/1a		Y
Plants	Sicilian honey garlic	<i>Allium trachyscordum</i>	Desk study	-	Yes - Category 3	Yes	-	Central Asian species - population information unavailable. Not recorded during field surveys.	Out			
Plants	Two-flowered tulip	<i>Tulipa biflora</i>	Field survey	-	Yes - Category 1	-	-	Probably endemic - Cat 1 KRB.	In	Criterion 2/1c		Y
Plants	-	<i>Arthropytum subulifolium</i>	Field survey	-	Yes - Category 3	Yes	-	Assumed EOO <50000 based upon published literature which states the species occupies a narrow region of the Chu-Ili Range, therefore screened un under Criterion 3/2.	Out	Criterion 3/2		
Plants	-	<i>Astragalus chaetodon</i>	Field survey	-	Yes - Category 3	Yes	-	Assumed EOO>50000 based upon records in Kz and Turkmenistan. Therefore, Screened out as Cat III status only.	Out			
Plants	-	<i>Astragalus neo-popovii</i>	Field survey	-	Yes	Yes	-	Probably endemic. Unclear; potentially not on KZ Red Book. Also, not observed during field surveys.	Out			
Plants	-	<i>Atraphaxis virgata</i>	Field survey	-	Yes - Category 3	Yes	-	Central asian species, wide-ranging including China, Mongolia and Central Asia - population information unavailable. Present in Aol	Out			
Plants	-	<i>Limonium leptophyllum</i>	Field survey	-	Yes - Category 3	Yes	-	Assumed EOO>50000 based upon records in Kz and Tukmenistan. Therefore, Screened out as Cat III	Out			
Plants	-	<i>Scutellaria titovii</i>	Field survey	-	Yes - Category 3	Yes	-	Assumed EOO>50000 based upon records in Kz and Tukmenistan. Therefore, Screened out as Cat III	Out			
Plants	-	<i>Stroganowia trautvetteri</i>	Field survey	-	Yes - Category 3	Yes	-	Assumed synonym of <i>Lepidium trautvetteri</i> . Fairly wide-ranging Central Asian species, occurs in Kazakhstan, Kyrgystan, Turkmenistan, Tajikistan and Uzbekistan; exceeding EOO threshold of 50,000km ² . Present in Aol.	Out			

Herpetofauna	Steppe tortoise	<i>Testudo horsfieldii</i>	Desk study / field survey	-VU	-	-	-	No global population data found, although the species is known to be very widespread across Central Asia. Declines have led to low densities in Turkmenistan of 300/km ² . Site data suggests up to 10 sightings per day. Not considered feasible to be present in numbers that would threaten the global VU status if lost. PBF as IUCN VU.	Out			Y
Herpetofauna	Central Asian brown frog	<i>Rana asiatica</i>	Desk study	-	Yes - Category 3	-	-	Screened out as Cat 3 on Kz Red Book.	Out			
Invertebrates	Beautiful demoiselle	<i>Calopteryx virgo</i>	Desk study	-	Yes - Category 3	-	-	Screened out as Cat 3 on Kz Red Book.	Out			
Invertebrates	Blue emperor	<i>Anax imperator</i>	Desk study	-	Yes - Category 3	-	-	Screened out as Cat 3 on Kz Red Book.	Out			
Invertebrates	Bolivar's short winged mantis	<i>Bolivaria brachyptera</i>	Desk study	-	Yes	-	-	Screened out as Cat 3 on Kz Red Book.	Out			
Invertebrates	Common predatory bush-cricket	<i>Saga pedo</i>	Desk study	-VU	Yes	-	-	Screened out as no records from within the Aol. No population information but widely distributed across southern Europe, Central Asia and China	Out			
Invertebrates	-	<i>Ceraeocercus fuscipennis</i>	Desk study	-	Yes - Category 3	-	-	Screened out as Cat 3 on Kz Red Book.	Out			
Invertebrates	-	<i>Chilocorus bipustulatus</i>	Desk study	-	Yes	-	-	Screened out as numbers across the Aol unlikely to be at CH trigger levels. The species has a very wide range of habitat tolerances, with no indication that the Project site has any particular importance in this regard. No population information but widely distributed in western palearctic	Out			
Invertebrates	-	<i>Coenonympha mongolica</i>	Desk study	-	Yes - Category 3	-	-	Screened out as Cat 3 on Kz Red Book.	Out			
Invertebrates	-	<i>Dorcadion balchashense</i>	Desk study	-	No – formerly Category 3 Yes	-	-	No longer on KZ Red Book	Out			
Invertebrates	-	<i>Porphyrophora sophorae</i>	Desk study	-	Yes - Category 3	-	-	Screened out as Cat 3 on Kz Red Book.	Out			
Invertebrates	-	<i>Porphyrophora victoriae</i> (Homoptera)	Desk study	-	Yes - Category 3	-	-	Screened out as Cat 3 on Kz Red Book.	Out			
Invertebrates	-	<i>Stethorus punctillum</i> (Coleoptera)	Desk study	-	Yes - Category 3	-	-	Screened out as Cat 3 on Kz Red Book.	Out			
Invertebrates	-	<i>Sphex flavipennis</i> (Hymenoptera)	Desk study / field survey	-	Yes – Category 3	-	-	Screened out as Cat 3 on Kz Red Book.	Out			

APPENDIX B – FIGURES

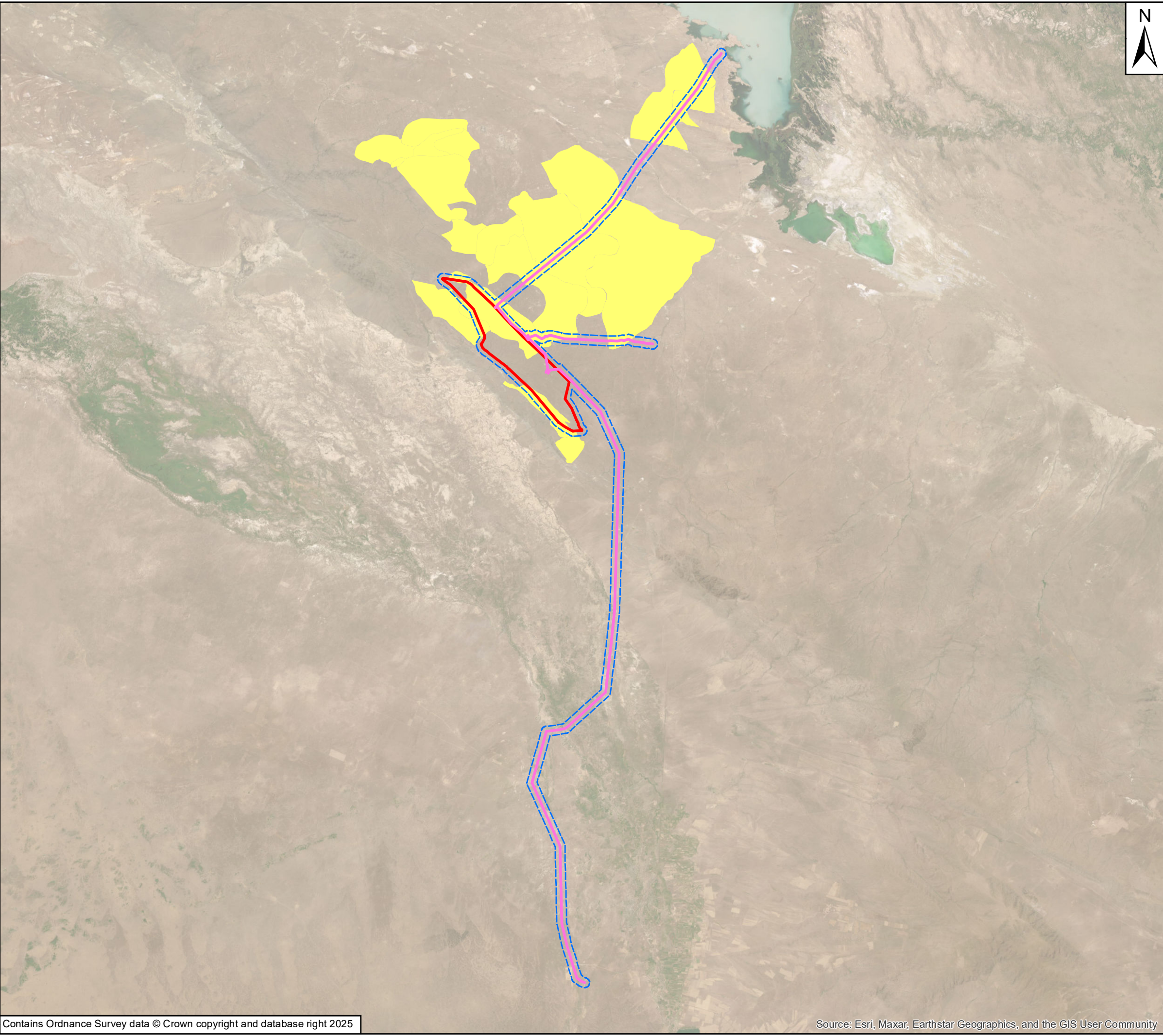


Key





-  Site Extent
-  OHL Route Options
-  1km Area of Influence
-  Resident Species EAAA

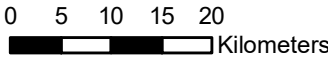


Client:	Total Energies		
Project:	Mirny Wind Farm Project		
Title	Resident Species EAAA		
Drawing No:	Figure 1	Drawn:	SD
Date:	22/12/2025	Checked:	XX
Scale:	750,000 @ A3	Approved:	XX

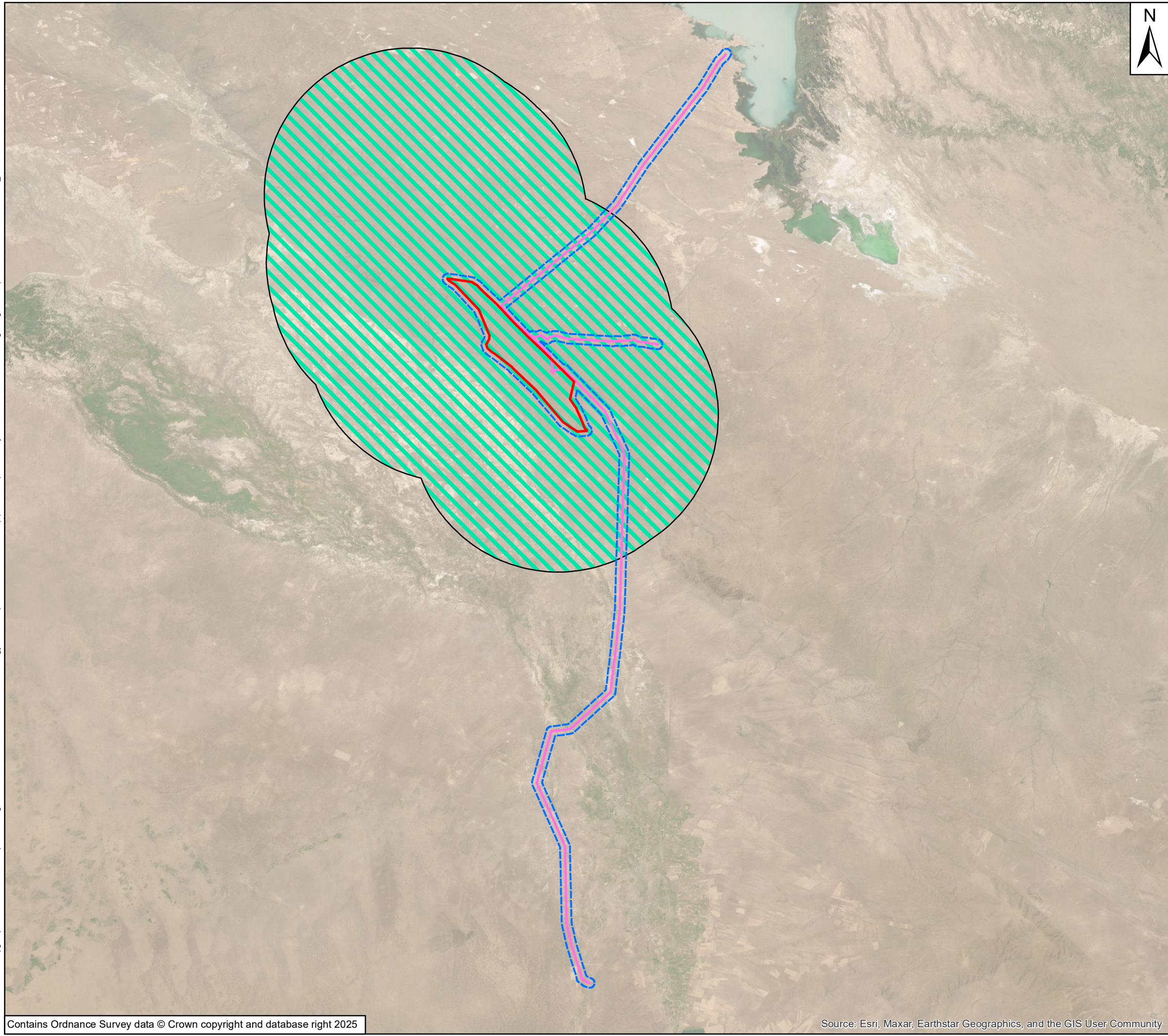


Key





-  Site Extent
-  OHL Route Options
-  Area of Influence
-  Tulip spp EAAA (Critical Habitat)



Client:	Total Energies		
Project:	Mirny Wind Farm Project		
Title	Tulip spp EAAA		
Drawing No:	Figure 2	Drawn:	SD
Date:	22/12/2025	Checked:	XX
Scale:	750,000 @ A3	Approved:	XX

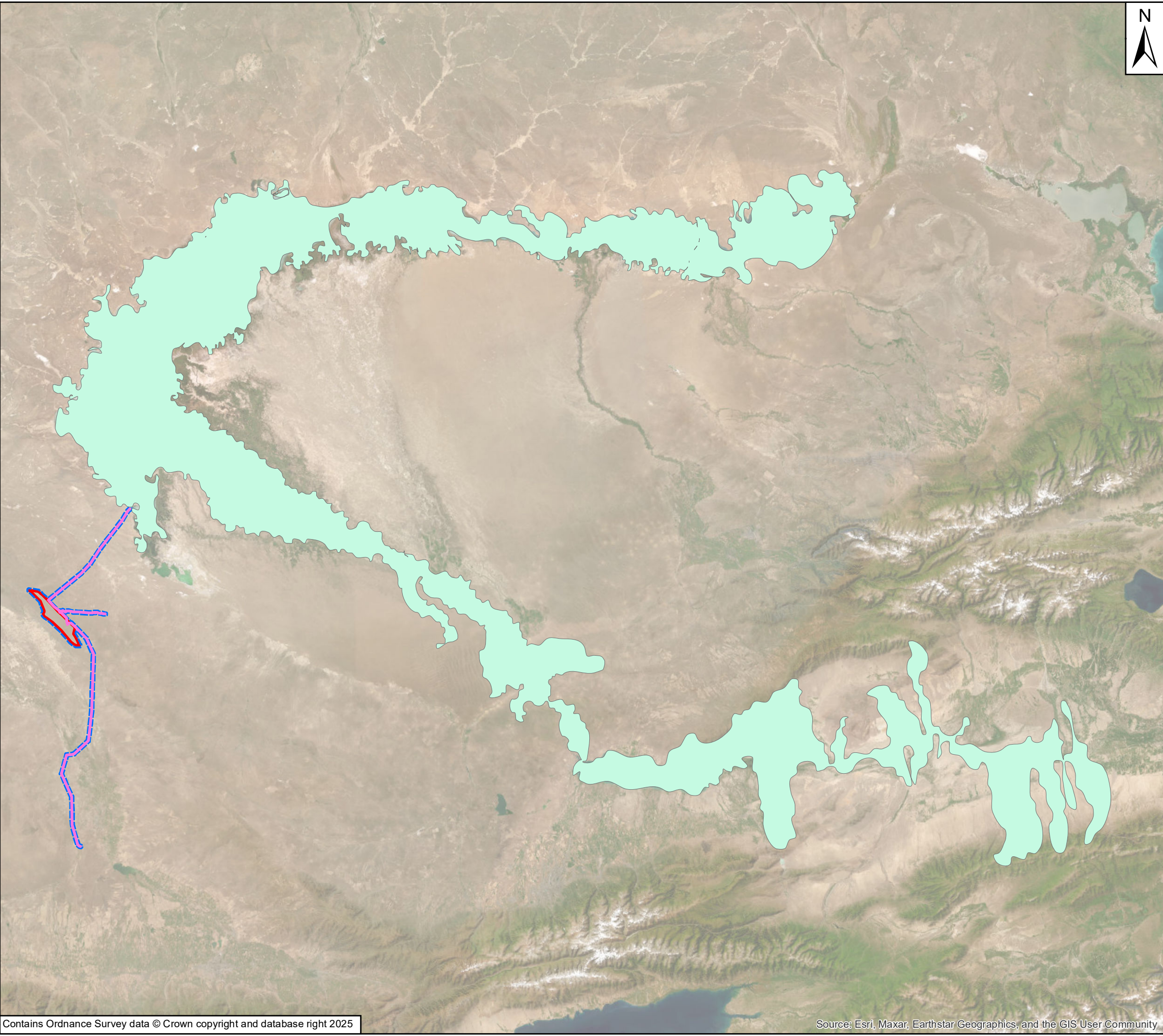


Key

-  Site Extent
-  OHL Route Options
-  1km Area of Influence
-  Argali Sheep and Goitered Gazelle EAAA



Client:	Total Energies		
Project:	Mirny Wind Farm Project		
Title:	Argali Sheep and Goitered Gazelle EAAA		
Drawing No:	Figure 3	Drawn:	SD
Date:	12/23/2025	Checked:	XX
Scale:	750,000 @ A3	Approved:	XX



N

Key

Site Extent

OHL Route Options

1km Area of Influence

Ship Sturgeon EAAA

015304560

Kilometers

wsp

Client:

Total Energies

Project:

Mirny Wind Farm Project

Title:

Ship Sturgeon EAAA

Drawing No: Figure 4

Date: 21/12/2025

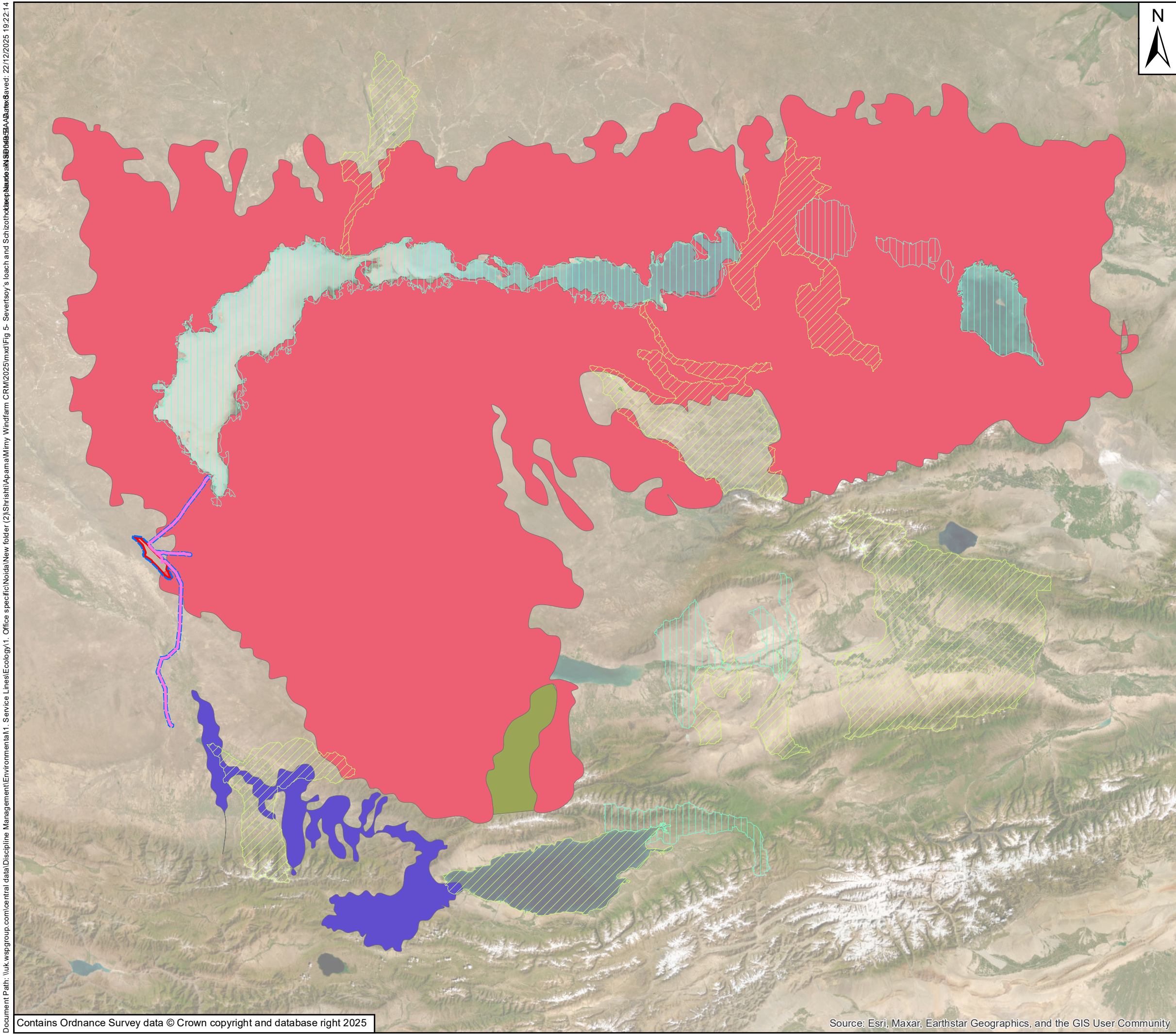
Scale: 2,059,667 @ A3

Drawn: SD


Checked: XX


Approved: XX


Document Path: \\uk.wsp.group.com\central_data\Discipline Management\Environmental\1. Service Lines\Ecology\1. Office specific\Noida\New folder (2)\Shrishti\Apama\Mirny Windfarm CRM\2025\mxd\Fig 5- Severtsoy's loach and Schizothorax pseudoaksaiensis saved: 22/12/2025 19:22:14




Key


 Site Extent


 OHL Route Options

 1km Area of Influence


Severtsoy's Loach EAAA


 Extant (Resident)


 Extent & Introduced (Resident)

 Possibly Extinct

Schizothorax pseudoaksaiensis

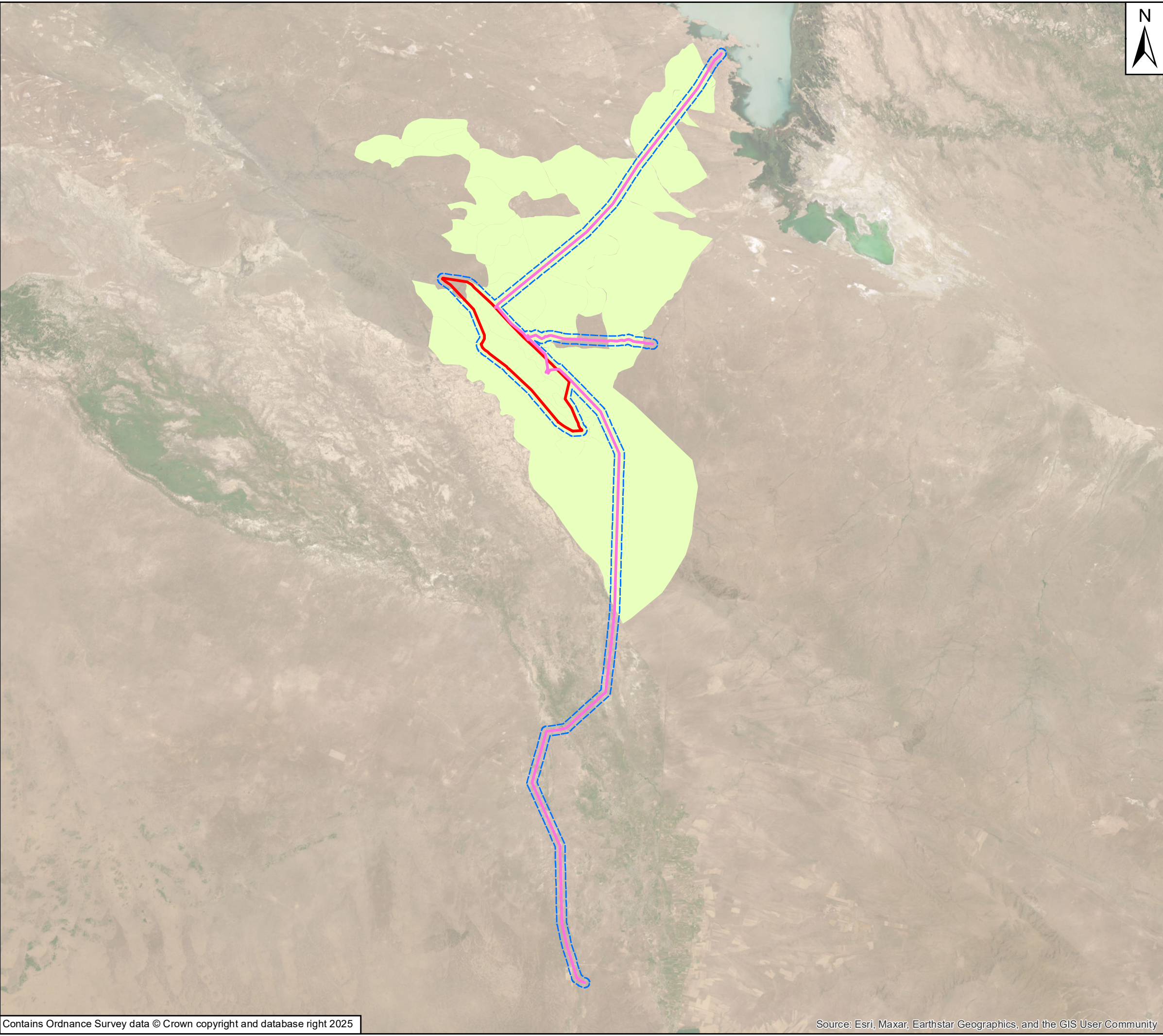
 Extant (resident)

 Possibly Extinct

0 10203040
 Kilometers



Client:	Total Energies		
Project:	Mirny Wind Farm Project		
Title	Severtsoy's loach and Schizothorax pseudoaksaiensis EAAA		
Drawing No:	Figure 5	Drawn:	SD
Date:	22/12/2025	Checked:	XX
Scale:	2,800,000 @ A3	Approved:	XX



N

Key

Site Extent

OHL Route Options

1km buffer

KRB Flora EAAA

05101520

Kilometers

wsp

Client:

Total Energies

Project:

Mirny Wind Farm Project

Title:

KRB Flora

Drawing No: Figure 6

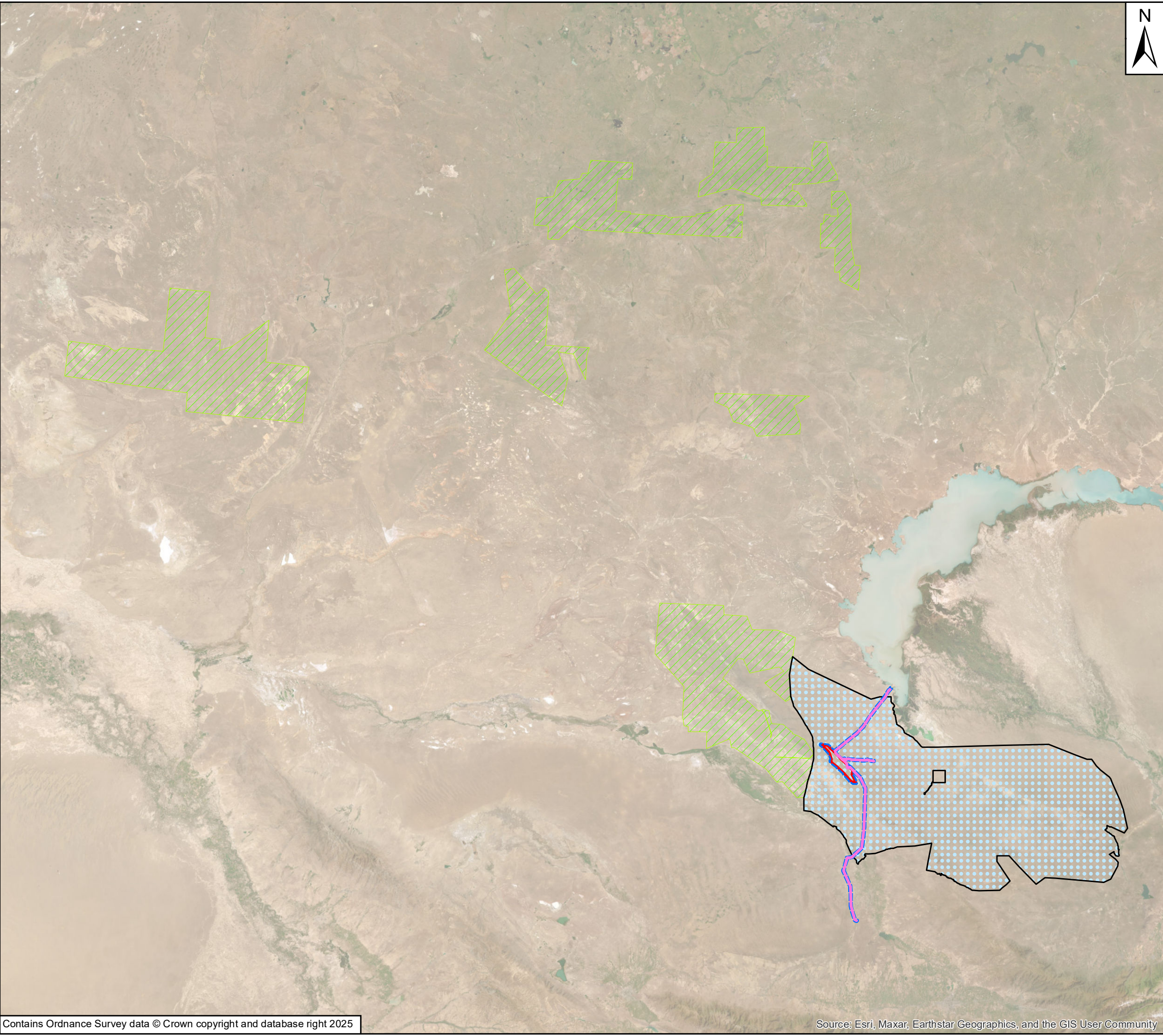
Date: 22/12/2025

Scale: 750,000 @ A3

Drawn: SD

Checked: XX

Approved: XX



N

Key

Site Extent

OHL Route Options

1km Area of Influence

Zhusandala Reserved Zone

Andasay Sanctuary

0 10203040

Kilometers

Client:

Total Energies

Project:

Mirny Wind Farm Project

Title:

Protected Areas EAAA

Drawing No:

Figure 7

Drawn:

SD

Date:

22/12/2025

Checked:

XX

Scale:

3,000,000 @ A3

Approved:

XX

APPENDIX C – IBAT REPORT



wsp.com