REPORT

Mirny (Kazakhstan) 1GW Wind Farm Project

ESBS Report Chapter 02 - Project Description

Submitted to:

Aktas Energy LLP

Submitted by:

WSP ITALIA S.r.l.

Via Antonio Banfo 43, 10155, Torino Italia

+39 02 87 25 90 00

24685792-002-R-Rev 04

December 2025

Distribution List

Aktas Energy LLP

WSP Italia

Table of Contents

TABLES

FIGURES

2.0 PROJECT DESCRIPTION

2.1 Overview

The Project consists in developing the Mirny onshore wind farm of 1 Gigawatt ("GW") installed capacity – combined with a Battery Energy Storage System ("BESS") – the related Overhead Transmission Lines ("OHTL") and the necessary additional roads.

Specifically, the Project consists of the following:

- 150 Wind Turbine Generators ("WTGs") for a total of 1 GW installed capacity and related foundations;
- 180km of trenches for laying medium voltage ("MV") cables of 35 kilovolt ("kV") connecting the WTGs;
- BESS of 300/600 Megawatt-hour ("MWh") that will be operated by Kazakhstan Electricity Grid Operating Company ("KEGOC");
- Step-up substations, one to the North Mirny SS and one to the South Mirny SS of 500 kV/35 kV;
- Three OHTL with a total capacity of 500 kV, running between North Mirny SS and Yukgres SS, between South Mirny SS and Shu SS, and between North Mirny SS and South Mirny SS and one OHTL of 35kV connecting to existing Kiyakhty SS, to have permanent grid connection for construction and O&M permanent compound facilities;
- Onsite roads and offsite access roads;
- Reactive power compensating devices; and
- An accommodation Camp.

2.2 Acting Parties

Aktas Energy LLP is the Project Owner (PO) and is owned by TotalEnergies. The PO is established in Kazakhstan, Astana, and manages the Project with a dedicated team and the support of the Sponsor's Key Expert.

The PO will be subcontracting the construction management to a dedicated Construction Management Company, TERSK, a local Affiliate of TotalEnergies Renewable.

The Project Engineering, Procurement & Construction Contractor ("the EPC Contractor") has still not been appointed.

At the time of this ESIA preparation, Aktas Energy LLP (or "the Company") is in the process of selecting the EPC contractor.

2.3 Project Location

The Project will be located in the Jambyl Region, in South-Central Kazakhstan, over an area of approximately 682 km².

The Project location is shown in Figure 1.

Figure 1: Project location (GoogleEarth Image).

The following figures show the Project layout and components (i.e., WTGs, substations, BESS, compounds, OHTL, roads).

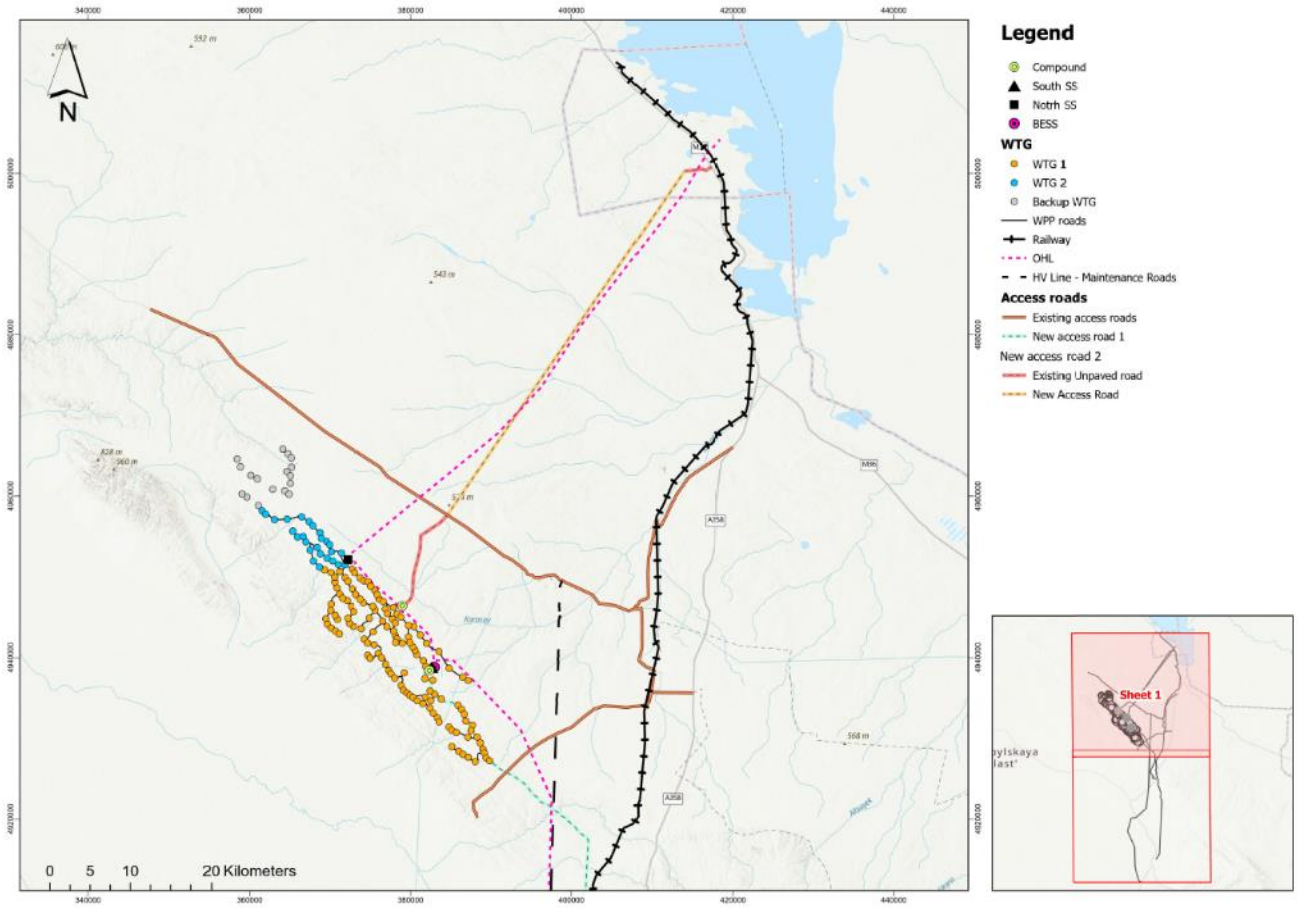

Figure 2: Project layout and components (Sheet 1)

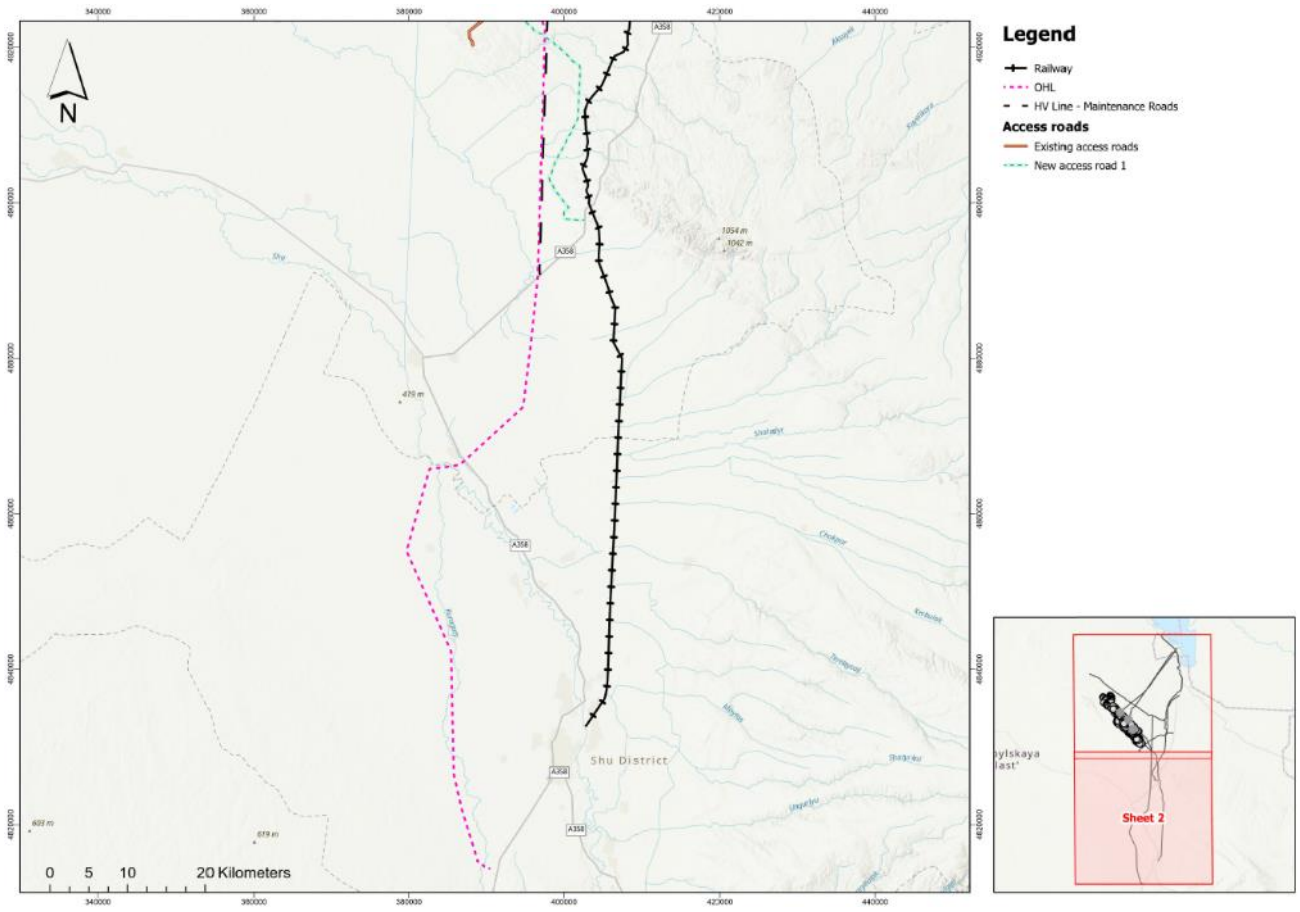

Figure 3: Project layout and components (Sheet 2)

2.4 Project Components

2.4.1 Wind Turbine Generators

The WTGs turn wind energy into electricity using the aerodynamic force from rotors' blades. When wind flows across the blade, the air pressure on one side of the blade decreases. The difference in air pressure across the two sides of the blade creates both lift and drag. The force of the lift is stronger than the drag and this causes the rotor to spin. The rotor connects to the generator that speeds up the rotation. The generator converts mechanical rotational energy into electrical energy. The electrical energy is converted by a converter in accordance with the current requirements of the grid operator. Next, a transformer converts the voltage for subsequent power transmission to the 35 kV cable network. Excess energy will be stored through the BESS.

The WTGs to be installed will consist of a wind wheel (three blades with a single hub), a nacelle, a mechanical transmission system, a power generation system, electrical equipment, a wind measurement system, a hydraulic and braking system, a cooling and lubrication system for mechanical equipment, an engine room casing and frame, a control and protection system, safety systems, a communication system, a tower and foundation, an entrance unit (with ladder and door).

A total of 150 WTGs will be installed on site. The WTGs will generate a total of 1 GW installed capacity. In the following figure, the WTGs are pointed out with blue, orange and grey dots:

- the grey dots are backup locations for potential additional turbines to be installed;
- the blue dots toward north-west represent the 26 WTGs type SANY; and
- the orange dots toward south-east represent the 124 WTGs type ENVISION.

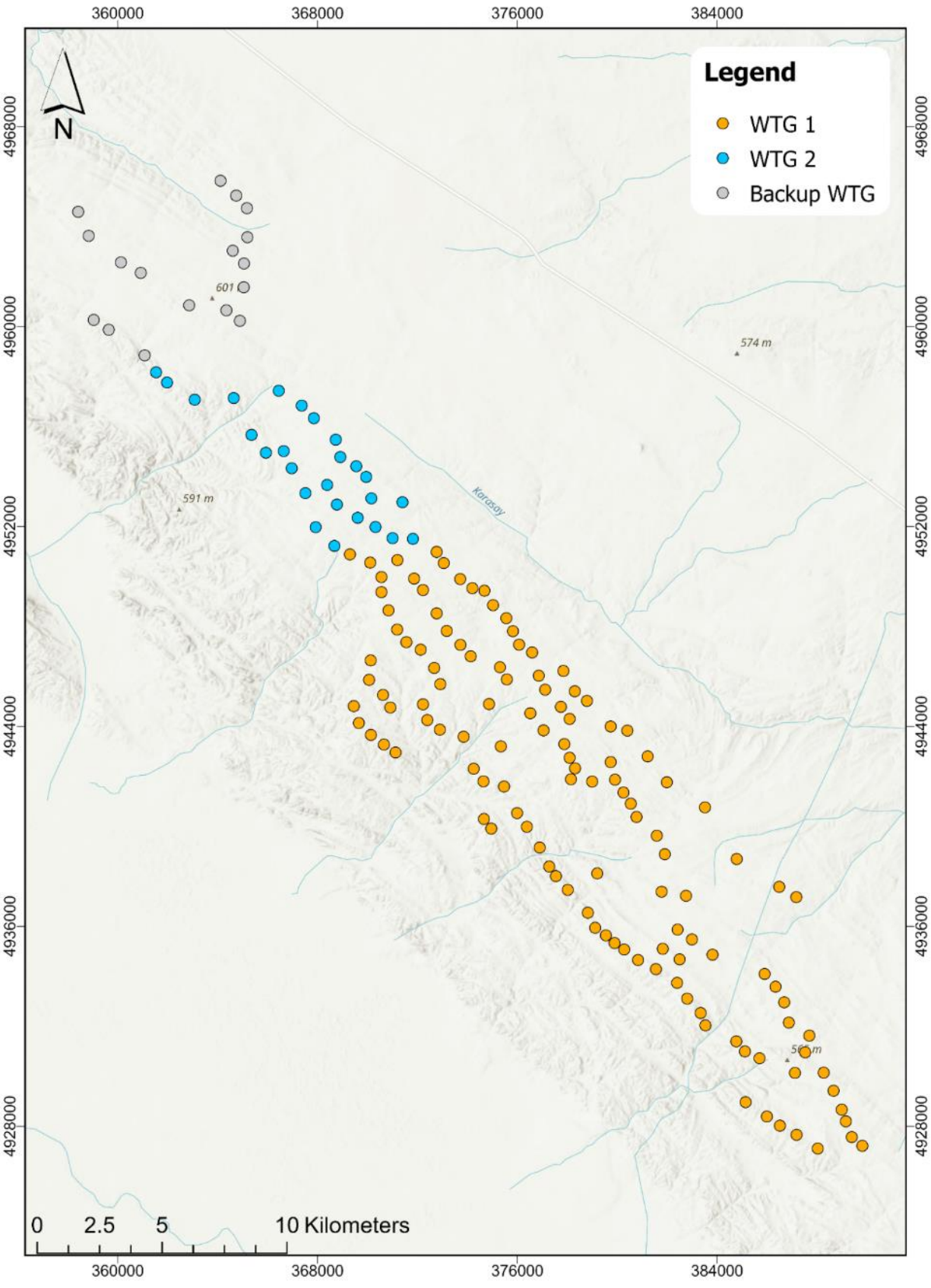

Figure 4: WTGs layout.

The following figure shows the two types of WTGs to be installed onsite, 124 of which are Envision EN-182/6.5 models with a rated capacity of 6.5 MW / 50 Hz and 26 Sany SI-19577 models with a rated capacity of 7.7 MW / 50 Hz Sanny.

Figure 5: SANY (to the right) and ENVISION (to the left) WTG types.

The tables below show the details of Envision and SANY WTGs:

Table 1: Envision WTGs details

1	Model	Envision EN-182/6.5
2	Rated power/frequency:	6.5 MW / 50 Hz
3	Rotor diameter:	182 m
4	Main shaft height:	110 m
5	Approximate weight:	275 t
6	Manufacturer:	Envision Energy Co., Ltd

Table 2: SANY WTGs details

1	Model	Sany SI-19577
2	Rated power / frequency:	7.7 MW / 50 Hz
3	Rotor diameter:	195 m
4	Main shaft height:	120 m
5	Approximate weight:	300 t
6	Manufacturer:	Sany Renewable Energy Co., Ltd.

Each WTG will be provided with a proper foundation which is a circular, continuous foundation slab with a diameter of 23.5 m and a variable thickness (from 300 mm to 2700 mm) with a 900 mm high pedestal located on it. Under the foundation, there is a 100 mm thick concrete base made of C16/20 concrete with dimensions exceeding the size of the foundation by 800 mm.

The foundation base is made of IGE-3 rock soil. The slab is reinforced with radial and ring reinforcement in the upper and lower zones with a 50 mm protective concrete layer. The foundation bolts are made in the form of an anchor basket and are included in the wind turbine delivery set.

2.4.2 Battery Energy Storage System

The batteries (i.e., BESS) will receive electricity from the WTGs and subsequently store it as current to then release it when it is needed. The wind energy supply can experience fluctuations due to weather, blackouts, or for geopolitical reasons, the BESS will help achieving a continual power flow. The BESS will be of 300/600

MWh, will be provided with a proper foundation and with a 35kV reticulation system and will be operated by JSC Kazakhstan Electric Grid Company (KEGOC).

The BESS will also be provided with a camp for the operation phase (see section 2.7.1).

2.4.3 Substations

As anticipated, the Project will be served by two substations, one to be located on the Northern portion of the Project site (the 500 kV North Mirny Substation) and one on the Southern (the 500 kV South Mirny Substation; see the figure below). The BESS will be located adjacent to the southern substation (see Figure 6).

The BESS equipment consists of 189 containers with technological equipment and 12 containers for supplying electricity for its own needs. The containers with technological equipment are equipped with a heating and cooling system, a detection and fire extinguishing system. The project provides access roads and passages across the wind farm territory, taking into account the transport used for transportation and a crane for unloading and loading containers.

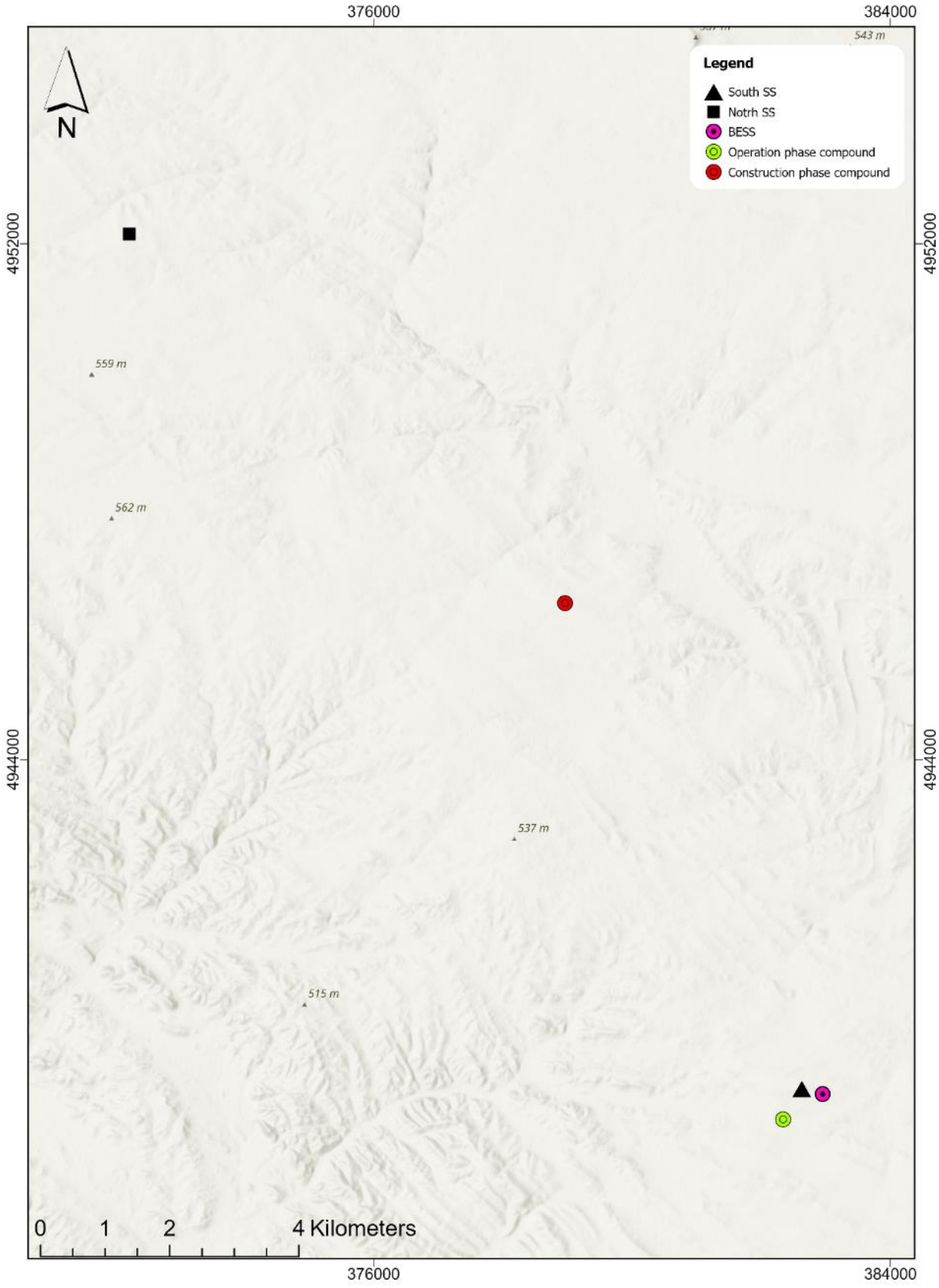

Figure 6: Project site substations, BESS and compounds (construction workers camp and operation and maintenance compound)

The two new electrical substations will serve to collect all the energy generated by the turbines and received through the MV cables.

Table 3: Electrical substation estimated details.

CONSTRUCTION CONTENT	LONG-TERM SCALE	CURRENT SCALE
North Mirny substation		
MAIN TRANSFORMER	2× Power Transformers	2× Transformers
500 KV POWER DISTRIBUTION EQUIPMENT	3 outgoing lines	2 outgoing lines
35 KV SWITCHGEAR	Different outgoing lines	Different outgoing lines
South Mirny substation		
MAIN TRANSFORMER	3× Power Transformers	3× Power Transformers
500 kV POWER DISTRIBUTION EQUIPMENT	2 lines	2 lines
500 kV SHUNT REACTOR	3× SHUNT REACTORS	3× SHUNT REACTORS
35 kV SWITCHGEAR	Different outgoing lines	Different outgoing lines

Each substation building will include a main control and communication room, a 500kV and main transformer protection room, a 35kV protection room, a pump room, and a firefighting room.

The major structures include the outdoor distribution device support and foundation, the main transformer foundation, the station area water supply and drainage, the station area roads and cable trenches, etc.

The transformers will be provided with cooling systems, fan protective devices, bushing domes (i.e., hollow electrical insulators aimed at allowing electrical conductors to pass safely through conducting barriers), conservators tanks to provide adequate space for expansion of oil inside the transformer and all necessary tools for carrying out the insulation resistance tests.

The oil dielectric strength will be ≥ 50kV/2.5mm and the insulation resistance of min 1 MΩ/kV.

2.4.4 Overhead Transmission Line

The Project will be also served by three OHTL with a capacity of 500 kV each.

The total length of the OHTL will be of about 230 km, of which about 70 km between the new North Mirny SS and Yukgres SS, 143 km between the new South Mirny SS and Shu SS, and 18 km between North Mirny SS and South Mirny SS.

Moreover, the installation of a OHTL of 35kV connecting Sholpan to the existing Kiyakhty SS will occur, to have permanent grid connection for construction and O&M permanent compound facilities.

The Project site team, through the control center, will monitor, supervise and handle potential issues.

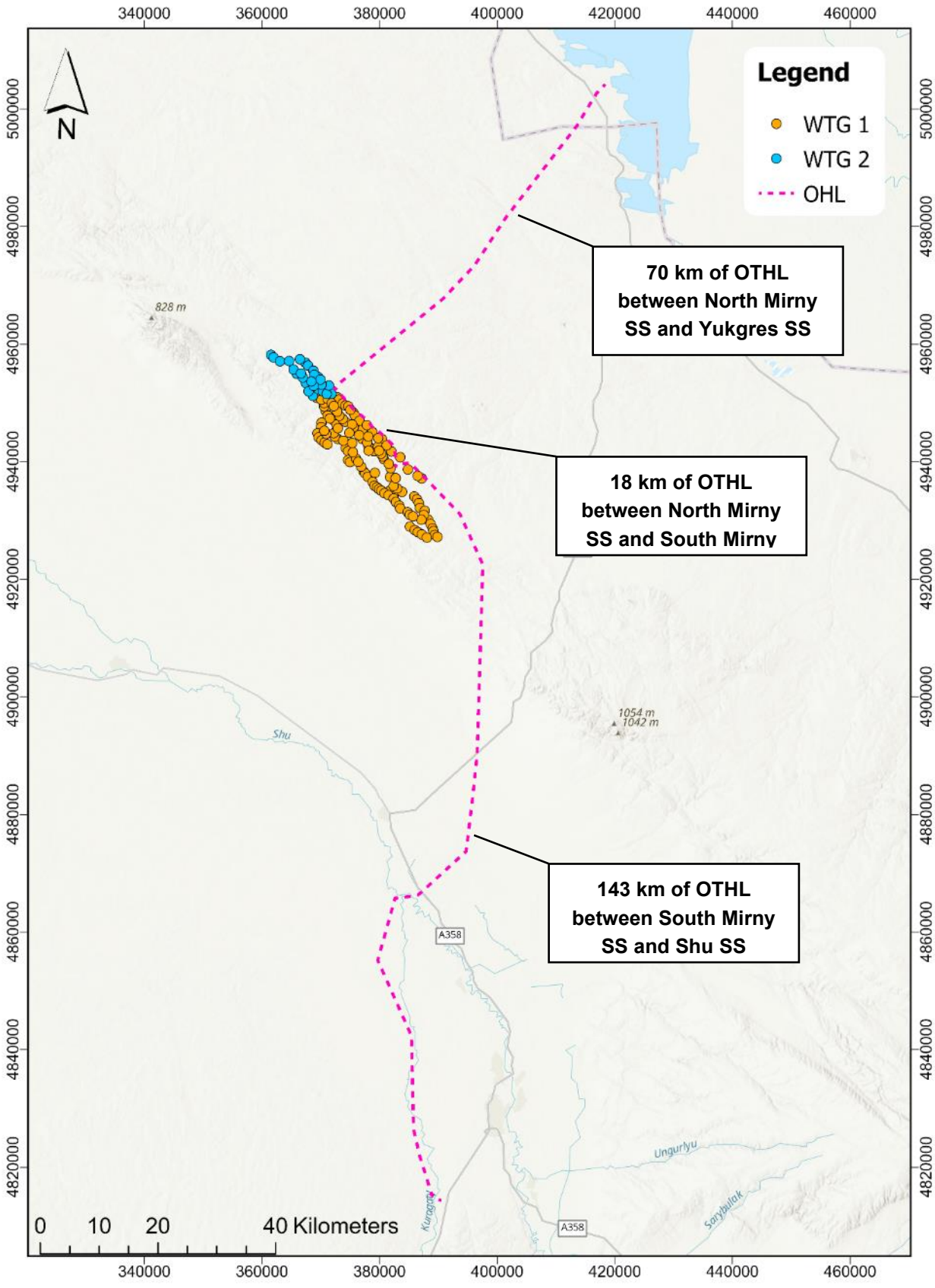

Figure 7: OHTL routing and WTGs locations (the 35kV OHTL Sholpan/Kiyakhty SS is not shown).

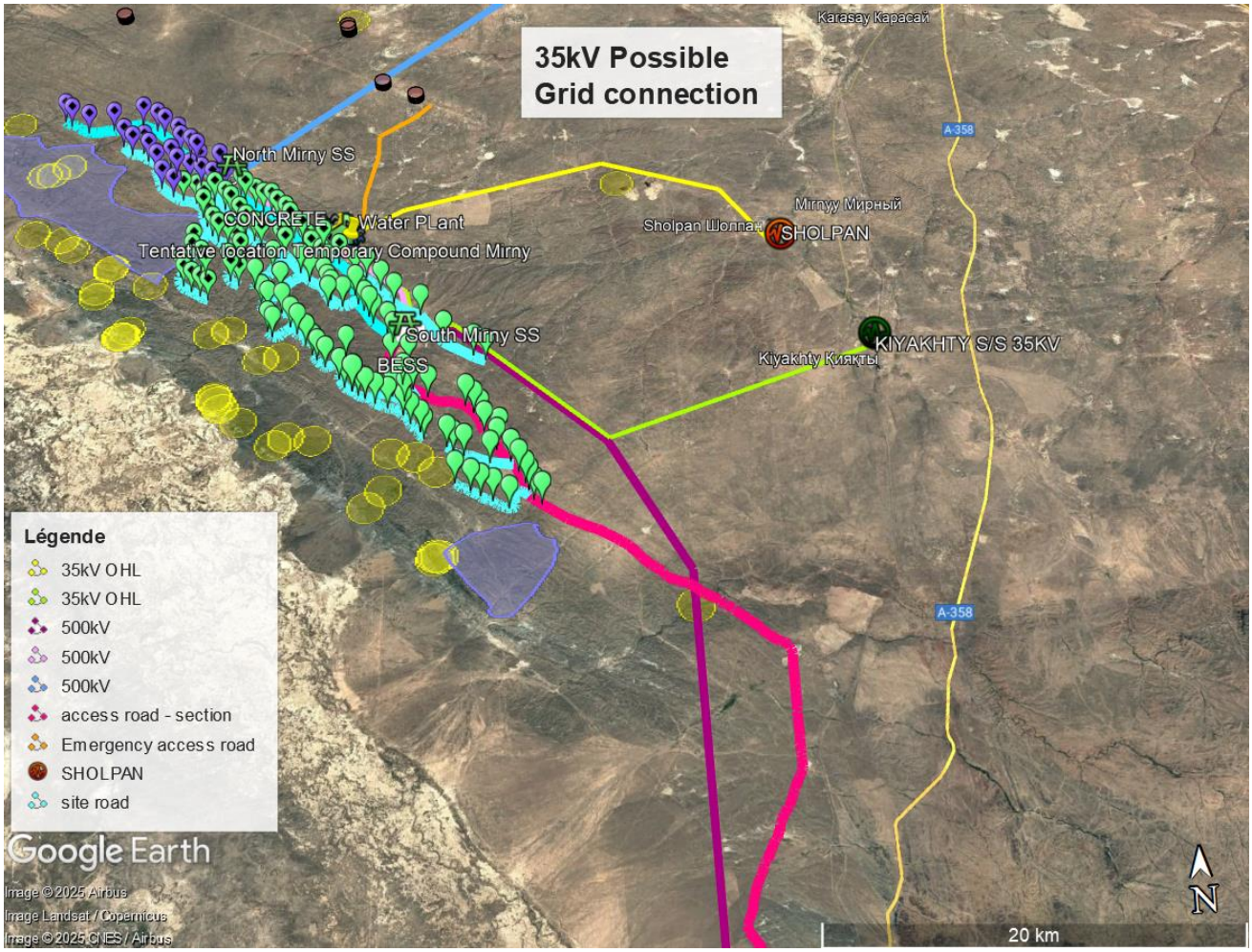

Figure 8: Map of the planned OHTLs and access roads.

2.4.5 Project's roads

To develop the Project, the Company will construct about 200 km of new roads (35 km of access roads and 160 km of internal roads) and will renovate about 146 km of access roads.

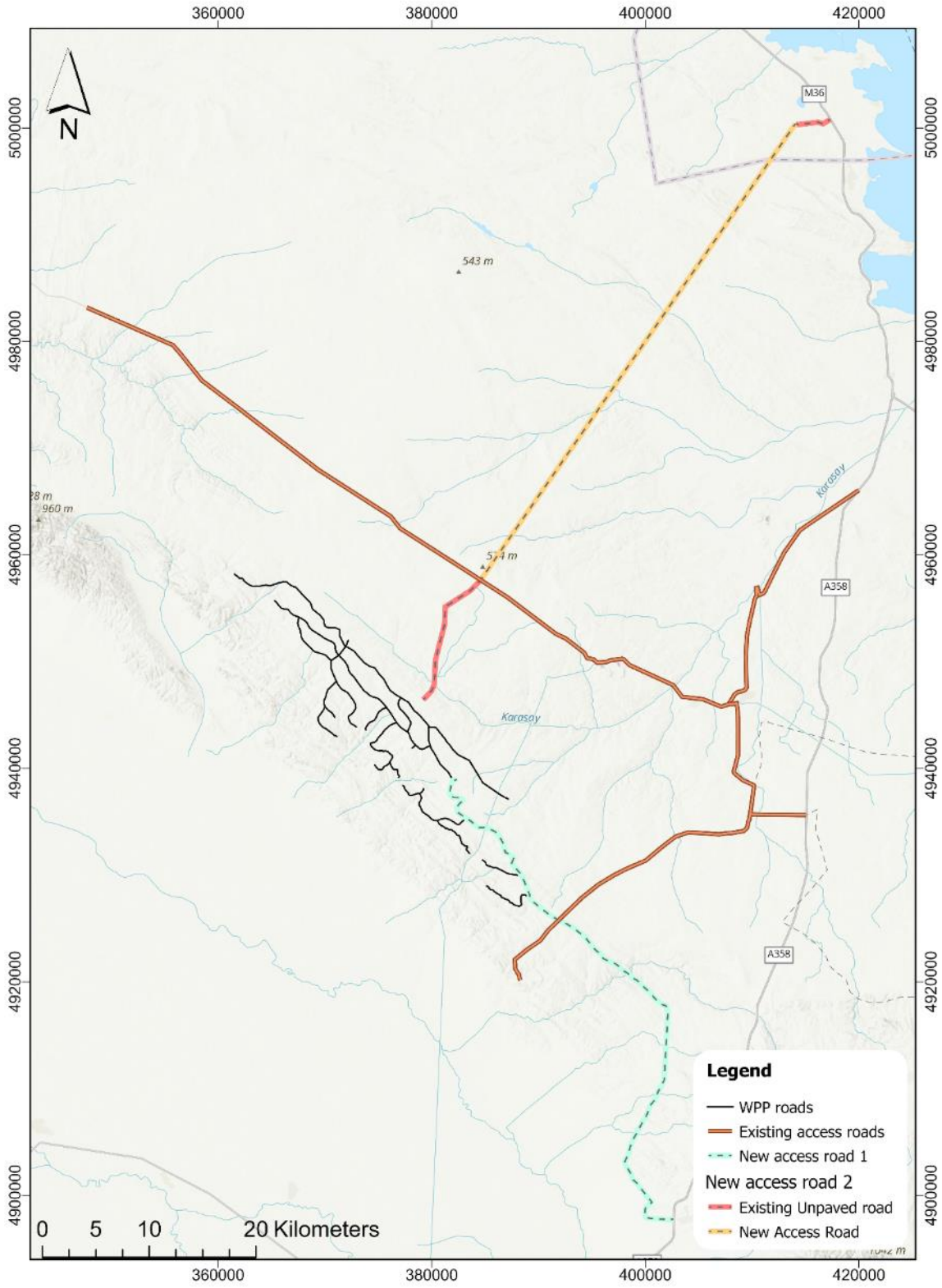

Figure 9: Roads layout.

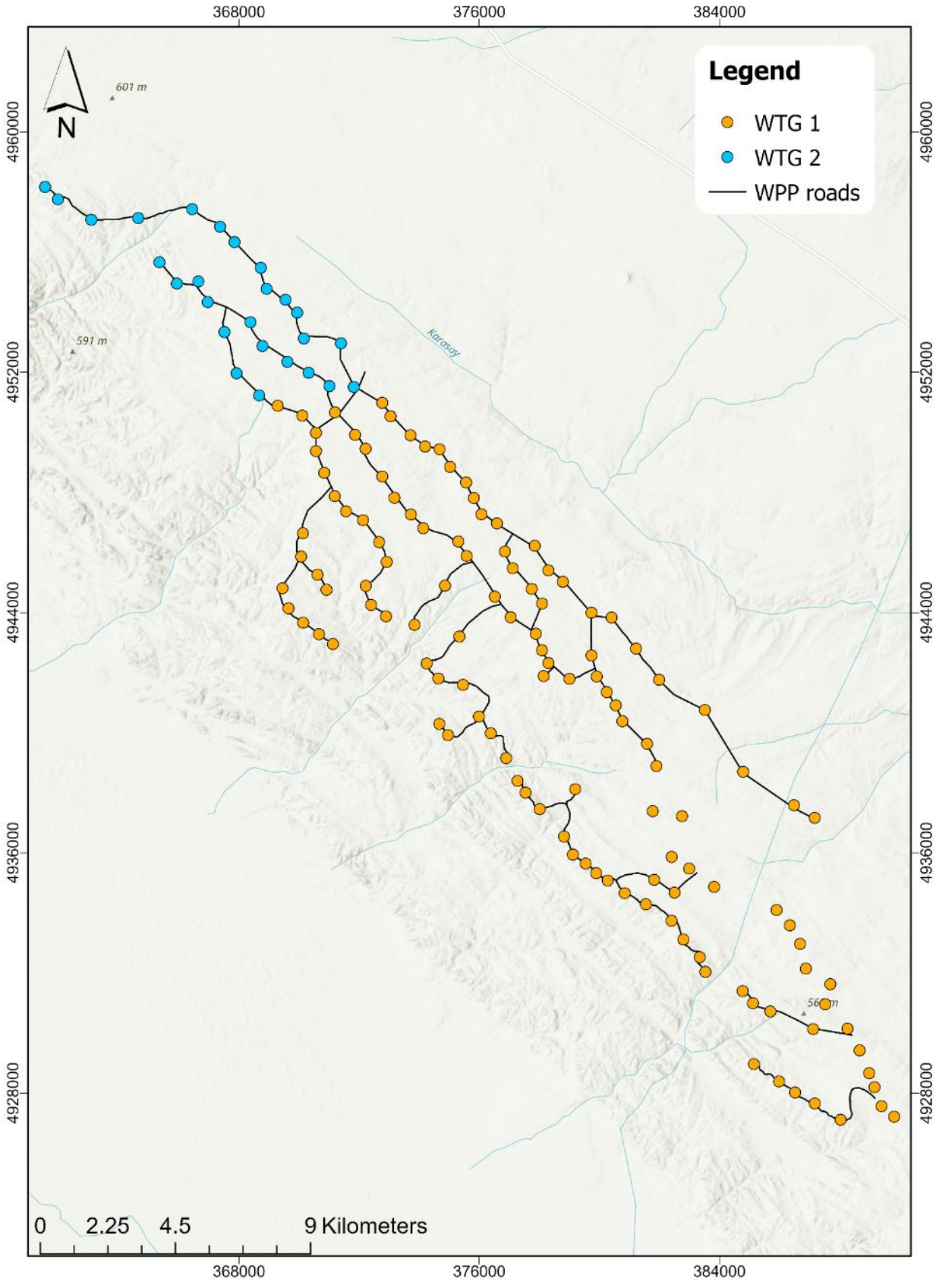

Figure 10: Onsite roads layout.

2.5 Project Pre-Construction

The Constructors will mobilize the personnel, as well as the equipment and machinery step-by-step.

Initially, the personnel, the equipment and the machinery will be mobilized to carry out the work for building the temporary construction camp. Once the main construction works start, in accordance with the work schedule, additional material, technical and human resources (including subcontractors' personnel, equipment and machinery) will be mobilized. Once obtained the permits to work, the contractor will start the following construction preparation works:

- fencing of the temporary and permanent compound areas, of the North & South Substations, and of the BESS and installation – in such areas and at the site access on the access road, at about 37 km from Khantau village – of lighting towers (the rest of the site it will not be fenced not affecting biodiversity sensitive areas);
- preparatory works will continue levelling the area for installing offices, open air and indoor warehouses for equipment and machinery, toilets, vehicles washing station, waste accumulation area, diesel fuel and water tanks, compressors and distributed generation system;
- topsoil stripping will follow, consisting of site clearing (i.e., vegetation and stones removal) up to 25 to 50 cm of depth by using a bulldozer;
- The soil stripped will be temporarily stored on site, at a dedicated location, so that can be reused for construction purposes; and
- Following the topsoil stripping, the site will be levelled.

2.5.1 Construction Camp

The construction site will host about up to 2,034 workers in average. During the peaks, onsite there will be about 2,007 workers. The construction will last for 30 to 36 months.

Before commencing the actual construction, the Contractor will build a compound that will include the construction camp to accommodate the construction site workers.

The construction compound location has been defined and – as shown in the figure Figure 6 – will be placed about halfway between the two substations. The compound includes the batching plant, two workshops (electrical, mechanical and civil works and preassembly area), the WTGs laydown area, the offices and the dorms.

The workers' camp will be placed in a matter that would prevent any adverse noise impacts. All buildings will be made from prefabricated containers and equipped with necessary engineering and technical equipment.

The camp construction will be carried out in three stages:

- 1st stage for 120 people (completion –First month from initial mobilization);
- 2nd stage for 700 people (completion – After 5th months from initial mobilization); and
- 3rd stage for 2,034 people (completion – After 16th months from initial mobilization).

The construction camp area will be divided into the following functional zones:

Living zone

- dormitories, one for working personnel (18 buildings with space for a total of 1,440 people during peak period) and one for management staff (24 buildings for 594 people) provided with washrooms, lighting, water supply & sewage services. The total capacity of the dormitories is of 2,034 people;

- offices for hosting 64 working seats (700 m^2);
- canteen for 500 seats (2 buildings);
- vegetable storehouse and grocery store (1 building);
- container-type refrigerated storeroom (5 units);
- laundry (2 buildings);
- containers for bottled water storage (2 units);
- sport complex (total area of 600 m^2);
- first aid medical block served by ambulance(s);
- training classroom (1 building);
- Firefighting team;

Utility zone

- underground septic tanks and portable toilets;
- water tanks for technical and firefighting water;
- fuel storage tanks;
- 2000 kVA Substation Transformer;
- diesel generator container;
- packaged pump station for firefighting and firefighting equipment depot.

Production area

- two mobile concrete mixing units, having a capacity of 100 m^3/hour each;
- backup Batch Plant with a personnel office, a diesel fuel tank and an 80 kW diesel generator set;
- quality control testing laboratory;
- prefabrication shop with platform;
- steel workshop (500m^2);
- carpentry workshop (100m^2);

Warehouse area

- warehouses for storing sand and crushed stone;
- equipment and materials storage area (1800m^2) including both indoor areas and open-air storage yards;
- silo for cement storage;
- controlled temperature storages (both heated and cold);
- WPP elements storage;

Parking area

- platform for inspection and repair of equipment;
- parking for special equipment and cars.

The construction camp will be powered initially by diesel generators, and by a 35kV transmission line.

Regarding the construction road, serving for construction activities, the road width of the construction site will be 7 m, with a turning radius up to 9 m, and will be used as a passage for transportation equipment during construction. The roads in the camp area will be concrete paved; the main camp road will be 6 m wide and the secondary road 2 to 4m.

Open drains will be provided on both sides of the road for managing the stormwater.

2.6 Project Construction

2.6.1 Construction activities

After completing the Pre-Construction phase, including the construction of the camp, the Contractor will kick actual construction off.

The construction will foresee the following stages:

- sumps and trenches excavation;
- crane pads preparation;
- WTG foundations construction;
- BESS foundations construction;
- OHTL installation; and
- roads construction.

The earth works will be carried out in accordance with the Project standards detailed in the regulatory framework chapter, and with the Company's requirements and procedures.

The works will depend on the type of soil existing at the Project area and will include:

- preliminary loosening of hard/dense rocks and soils by using a hydraulic hammer and by drilling and blasting;
- manual and mechanical excavation of sumps and trenches;
- backfilling of sumps and trenches; and
- soil compaction, surfaces leveling.

The soil compaction will be made for increasing its bearing capacity and impermeability.

Depending on machines used, the following methods of soil compaction will be applied:

- rolling – with various types of self-propelled rollers;
- vibration – with special vibrating machines.

Soil compaction will be carried out while building bases, embankments, backfilling pits and trenches to a compaction coefficient of 0.98 layer by layer.

The Balance of Plants (BoP) Contractor will appoint a dedicated Subcontractor to carry out quality control of compacted soil (i.e., testing to determine deformation modulus with soil loading/vertical load and radioisotope measurements).

Prior commencing the excavations, the Contractor will install a fence (exclusively around the compounds, the North and South SS and the BESS, as stated above) and establish a control access on main access and warning tape around the Project site perimeter and will post warning signs (e.g., speed limit, interdiction).

2.6.1.1 Sumps and trenches excavation and backfilling

The BoP Contractor will excavate the sumps.

Once the sumps will be excavated, these will be provided with drainage ditches, a pit for pumping out water in case of adverse weather conditions and a polyethylene film covering to protect the laid base.

The unreinforced sump slopes steepness will be made properly to prevent collapses.

The WTGs foundations will lay at a depth of 3.2 to 3.5 m on hard rocks having standard density of 2.71 g/cm^3, as highlighted by the geotechnical survey (i.e., IGE-3 rock soils, see *Chapter 04 – Environmental Baseline*).

To facilitate the soil excavation and drainage, the contractor will conduct the soil loosening by using a JCB-type 3CX4T backhoe loader with HM380 hydraulic hammer. The excavation will be carried out through a crawler single-bucket excavator with a backhoe (Hyndai R300LC-9S).

Figure 11: Example of Hydraulic hammer mounted on JCB-type excavator-loader.

The Contractor will appoint a subcontractor for conducting the blasting works.

The delivery of explosive materials will be made by road. The Contractor, under the Company supervision, will interface with local authorities to agree and notify in advance the time and location of the explosion. In any case the area will be properly interdicted and labeled.

The soil loosened by blasting will be excavated by using a tracked single-bucket excavator provided with a backhoe.

For backfilling, the Contractor will use soil purchased from a local quarry as well as suitable selected soil from the excavation process and the pre-construction works.

After completing concrete activities related to cast-in-situ foundations pouring, the sumps backfilling will be carried out mechanically by using front-end loaders dozers, through layer-by-layer compaction (compaction coefficient of 0, 95) to minimize structure settlement and ensure relatively water proofing.

The excavated material to be reused will be first visually inspected for ensuring its proper quality; also, a third-party independent laboratory will conduct the soil sampling and analysis.

Potentially contaminated soil as well as massive frozen clods will be temporary accumulated at dedicated locations and then disposed of.

The Contractor will be also in charge of excavating about 350 km of trenches between WTGs and BESS substations.

The trench for cables will have a depth of 0.9 m and a width of 1.5 m. The width of the trench at the bottom will be sufficient to carry out installation work and place the equipment; also, the distance from the outermost cable (or group of cables) to the edge of trench will be at least of 25 cm.

The trenches excavation will be carried out by using a single-bucket excavator with a dump of soil to the right or left of the trench.

Once completed, the trench and its immediate surroundings will be cleared of roots or rock outcrops, levelled and dried up (potential rainwater will be pumped out and soaked soil replaced with dry soil).

Along the trench route a sand and gravel mixture will be placed for backfilling cables and cable reinforced concrete slabs. The installation of the electrical cables and fiber optic cables will start only after inspections.

After laying the cables and before covering them (i.e., backfill), the Contractor will carry out a visual inspection of each cable and the insulation resistance tests.

Regarding the backfilling materials, 100mm of sand and gravel mixture will be placed under the cables and 200 mm above them. Above the top backfilling, reinforced concrete slabs with appropriate markings will be placed.

Cables slabs will cover the entire cable routing width, with an overlap of 50 mm on each side.

To prevent potential issues in case of future excavation works, the Contractor will cover the trench with additional soil up to a level of 150 mm from the ground level and will place marking tape along the cable route.

During the winter period, the Contractor will inspect the site on daily basis and, where needed, clean it from snow by using an excavator-loader and tractor MTZ 80 with brushes.

During excavations the Contractor will adopt proper measures for preventing soil freezing (e.g., cover the sump bottom with heat insulation material, loose frozen soil with single-bucket backhoe excavators by shoveling or with JCB 3CX4T excavator-loader with hydraulic hammer).

During the whole period of excavation works, an archaeologist will be on site daily for earthworks supervision, in case of finding any cultural object.

2.6.1.2 Crane pads

Near the WTGs foundation, the Contractor will build crane pads. Up today, 150 pads are planned (i.e., one per each WTG).

The crane pads will include crane parking pad, auxiliary pad for the crane and pad for blades storage.

Based on bearing capacity, the crane pad will be divided into 2 types, one with bearing capacity of 260 kN/m^2 (crane parking area) and one with bearing capacity 120 kN/m^2 (auxiliary pad for the crane and pad for blades storage);.

For the base preparation, the Contractor will remove the topsoil (including objects such as stones) up to 300 mm and level the surface to smooth it, to improve soil compaction and to increase its strength.

The soil compaction will be operated by means of road rollers (compaction coefficient of 0.98).

The construction of the base will be carried out in three stages:

- distribution of the first layer – 250 mm of crushed stone fraction 40-70 mm and compaction;
- distribution of the second layer – 200 mm of crushed stone fraction of 40-70 mm and compaction;
- distribution of the third layer – 15 m^3 per 1000 m^2 (22-24 kg/m^2) of wedging fractions of 10-20 mm and final compaction.

The distribution and compaction of the crushed stone will be carried out by using specific equipment (bulldozer, motor grader, roller, etc.). When leveling, each layer of crushed stone will be placed with a transverse slope of 1.5%. To reduce the friction, about 15-25 l/m^2 of water will be used while rolling.

2.6.1.3 WTGs foundations

The Contractor will build 150 standard gravity foundations. As alternative design, as necessary, it will option for either ribbed foundations or rock anchor foundations.

The following figures illustrate the different options.

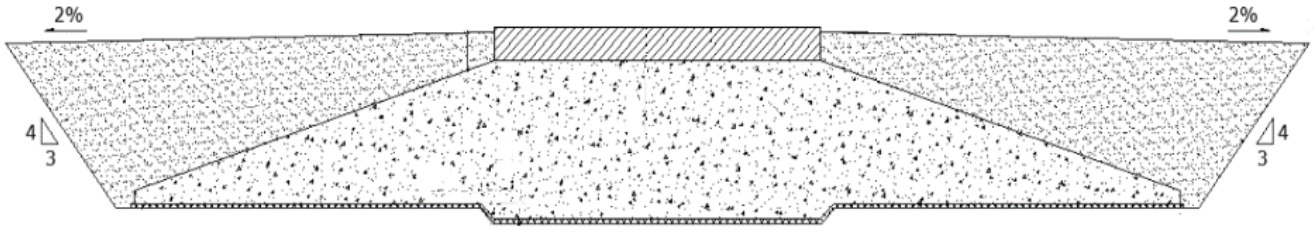

Figure 12: Foundation structure.

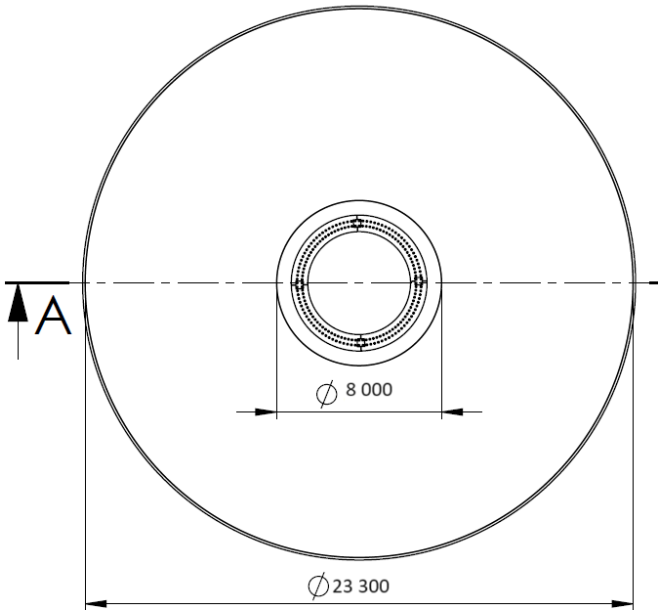

Figure 13: Gravity foundation.

The preliminary set of materials for reinforcement include:

- size range of bent forms of reinforcement, possible diameters from 12 to 32 mm, supplied in bundles;
- reinforcement elements with forged heads on one or both sides, possible diameters from 12 to 25 mm, supplied in pallets;
- Modix Center and anchor cage, supplied on pallets; and

- reinforcing bars with Modix squeezed coupling, for radial reinforcement, supplied in bundles.

Once delivered, the Contractor will store the reinforcing bars in bundles on racks sufficiently spaced, having sufficient height so that the steel reinforcement does not touch the ground.

The Contractor will produce the concrete mixture, with the support of a specialized subcontractor, by using two mobile concrete manufacturing plants/batch plants, having a capacity of 100 m^3/hour each.

One of the two plants will be used as backup.

The materials used in the plants (e.g., cement, additives) will be conform to the technical conditions required and will be properly stored for ensuring their proper temperature, humidity and integrity.

The water to be used will be properly selected to ensuring quality, characteristics and purity.

The following table illustrates the required volume of concrete mix expected for constructing the foundations.

Table 4: Estimated Volume of concrete mix for constructing the foundations.

Concrete strength grade	Designs of foundations		
	Gravity	Ribbed	Rock anchor
C20/25 (B25)	7,000 m^3	7,000 m^3	75 m^3
C35/45 (B45)	120,000 m^3	79,000 m^3	-
C40/50 (B50)	-	-	450 m^3
C50/60 (B60)	9,300 m^3	9,300 m^3	-
TOTAL	136,300 m^3	95,300 m^3	525 m^3

The WTG foundations will be made of cast reinforced concrete based on sulfate-resisting Portland cement concrete, water resistant (grade W6) and frost resistant (F100):

- C50/60 (B60) - base (pedestal) of gravity and ribbed foundations;
- C35/45 (B45) – the lower and middle part of gravity foundation;
- C35/45 (B45) – the lower part and stiffeners of ribbed foundation; and
- C40/50 (B50) – grid of rock anchor foundation.

Below the foundations, the blinding will be made of C20/25 (B25) concrete water and frost resistant (W6 and F100) thick 100 mm and of a mixture of crushed stone of 40-70 mm fraction and bitumen also thick 100 mm.

The concrete mixtures, once out of the manufacturing plant, will be divided in batches. The batches will be checked and provided with quality documentation providing details on the concrete's strength, frost resistance, water resistance, strain capacity, segregation ability, average density and porosity, volume of entrained air, preservation of technological properties and temperature.

The operating batch plant will be served by a quality control laboratory provided with equipment to determine the concrete fluidity, with thermometers and air entrainment meters.

The concrete will undergo the casting process, which consists of preparing the mold or formwork, mixing the concrete, placing the concrete in the mold, and allowing the concrete for shaping and compacting.

Prior to start casting the concrete mix into the formwork, the formwork will be cleaned and lubricated.

The concrete transportation will be made by using concrete mixer trucks mounted on trucks, having a working capacity of 7 to 12 m^3.

Additionally, the Contractor will work on the reinforcement installation.

The reinforcement will be made through a Modix Center, consisting of a group of steel disks, one at the top and two at the bottom, with holes for threaded connection with radial reinforcement rods, plus the anchor cage on the blinding.

At first, the buried part in the center of the foundation will be reinforced by installing a reinforcement ring and straight rods in radial direction. Then the Contractor will reinforce the lower zone.

The installation will foresee a 1st tier of radial reinforcement and of lateral reinforcement, the erection reinforcement and a 2nd tier of radial and lateral reinforcement.

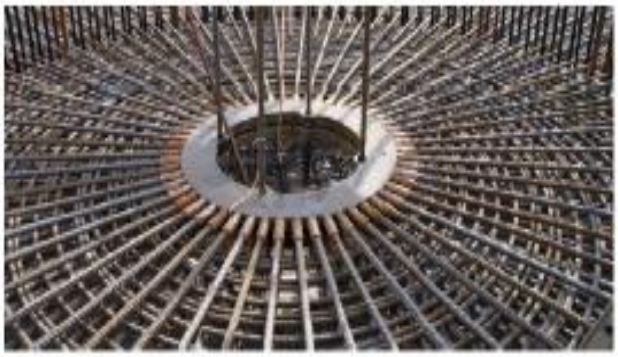

Figure 14: Lower zone reinforcement.

The rebar with couplings will be screwed into the Center until the latching up of the control ring. The required tightening torque will be achieved once the ring will be latched.

The upper zone reinforcing strategy will be similar to the lower zone one. The installation will foresee a 3rd, 2nd and 1st tiers of radial and lateral reinforcement plus an edge reinforcement. The other elements of the upper zone will be fixed by using tie-wire.

Figure 15: Upper zone reinforcement.

Once the upper and lower reinforcement will be completed, the first part of web reinforcement outside the anchor cage will be carried out.

Figure 16: Web reinforcement.

Before starting the formworks, the cable transits for medium voltage electrical cables (like polymeric pipes with 200 mm diameter), fiber optic cables and grounding cables will be laid in each foundation. The Contractor will install five pipes in each foundation, moreover there will be 1 or 2 pipes will be without cables, which will serve as backup. Such pipes will be placed at least 2 m above the surface of the foundation and below the foundation circumference and will be secured to foundation reinforcement with tie- wires.

To pour the standard gravity foundation, the Contractor will use a radius wall formwork having a diameter of 23,3 m. The formwork will be made of ready-made panels on a range of 1 m long and 350 mm high. Sheet steel 5 mm thick with the required rounding radius will be used as a deck. The formwork of the pedestal with 8000 mm diameter will be assembled from panels 1005 mm long and 620 mm high. The formwork will be assembled directly at the installation area.

Formwork for foundation ribs will be made of rectangular linear panels. Birch laminated plywood with increased wear resistance, 18 mm thick, will be used as a deck form for linear panels. To increase stiffening, the Contractor will install spreaders between the formwork panels of the foundation ribs.

The installation will be likely made by using wooden scaffoldings.

Figure 17: Wooden scaffoldings likely to be placed to facilitate the installation process.

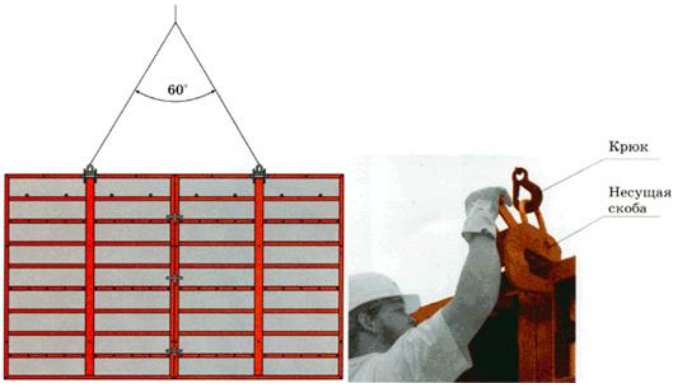

Figure 18: Formwork panel slinging.

Once the formwork panels installation will be completed, the concrete will be placed by two Daewoo Novus concrete pumps (boom length 20 to 60 m, maximum supply volume of 120 m^3/hour). A concrete pump hose will be used for injecting the concrete mix in the casting place.

The concrete mix will be cast into the structure uniformly, layer by layer, with thicknesses 30 to 40 cm.

Once concreting is completed, a horizontal working seam will be formed at the elevation behind the pedestal, and a technological break will be made before concreting the pedestal structure.

For compaction of the concrete mix the Contractor will use a pervibrator WackerNeuson IEC 45/230/5 which will be used carefully to avoid damaging the structure.

In case the concreting will be done in hot weather conditions or cold weather conditions (< 5°C), specific concrete products will be used.

Once the concreting will be completed, the Contractor will operate the formworks removal.

The works for building the anchor foundation will be carried out by specifically licensed subcontractors.

The construction of anchor foundation includes installing a drilling rig and drilling 24 wells (having diameter of 130 mm and depth of 14 m by using Atlas Copco Mustang 5-P4) and injecting anchor piles "Atlant" Ø73x13x3000mm under each foundation. The set of anchor piles will include installing anchors (i.e., rods) 3 m long, couplings and base plate boring bit.

Once the design depth of 14 m will be reached, the well will be filled with flushing cement mortar to displace drill slurry and ensure the load-bearing capacity of anchor on soil. The anchors installation will be carried out by sequential spudding the rods vertically into the ground at a constant speed of no more than 0.5 m/min with a rotation of about 50 rpm. The drill rods will remain in the wells as reinforcing elements.

When concreting the grid, a gap will be left under anchor cage bolts for pouring non-shrinking mortar with strength class of at least C70/85.

After all steps, the reinforcement and formwork works will be completed (i.e., anchor cage mounted and grid concreted).

2.6.1.4 WTGs installation

As per the Project needs, onsite will be installed the following types of turbines:

- n. 26 WTGs type SANY SI19577 (195m rotor diameter, 7.7 MW, with 120m hub height);
- n. 124 WTGs type ENVISION EN182 (110m rotor diameter, 6.5 MW, with 110m hub height).

The WTGs, after their transportation, will be stored on a WTGs properly dedicated laying area.

The WTGs will be then delivered to the 150 installation locations and will be lifted by using the cranes laying on the cranes pads.

2.6.1.5 BESS foundations

The Contractor will build the foundations for medium voltage double blocks, the power conversion systems (inverters) and the BESS container.

The foundations of the BESS will be poured in separate blocks:

- Like 600x600x600 mm (h) – for blocks and inverters (preliminary – around 950 pcs.);
- Like 600x600x400 mm (h) – for containers (preliminary – around 1700 pcs.).

The structures will be made of reinforced B25 grade concrete based on sulfate-resisting Portland cement.

The base of foundations will be made of layer-by-layer compacted soil having a compaction coefficient K=0.95. Above it, the Contractor will lay a 200 mm thick crushed stone layer of 20-40 mm fraction. The foundation blocks will then mounted on such crushed stone layer.

The BESS cables will be hosted in trenches for direct laying into the ground.

The cables will be laid with a slight snaking to avoid possible stress during ground settlement.

Prior to laying the cables in the trenches, the trenches bottom will be levelled, compacted, covered with geotextile membrane and spread with 250 mm of clean sand.

The cables separated by using perpendicular cable tiles for all length.

More details relating the trenches construction are provided in the section 2.6.1.1.

Part of the cabling system will be placed above ground.

For the aboveground cables which will be installed through or across the edges of trays or other steel structures, the edges will be smoothed, painted and other protective means will be installed to avoid cable damage. Protectives coatings will be applied on the cut off on ladders holes edges for cables inlet. Throughout the route of the cable trays and ladders, the continuity of grounding on the butt pads and expanding connections will be ensured. All parts will be connected together and grounded. The above-ground points for the cables inlets into buildings will be placed with an angle of 10° below the horizontal axis to avoid water ingress. The low-voltage multicore power cable passing above the ground and having more than 30 mm in diameter will be fixed with special corrosion-resistant terminals and the other cables will be secured with stainless nylon cable ties. Cable clamps will be fastened to two holes, and mechanically classified to protect against a potential high-level short circuit. Single-core power cables for AC will be installed on the ladder racks in a three-leaf position and will be permanently fastened with heavy-duty, corrosion-resistant clamps with intermediate straps between the clamps. Clips and linings will undergo testing. The cables will be supported within 600 mm of terminal points as well as through walls or floors.

2.6.1.6 500kV OHTL metal poles installation

The OHTL structure will be made of steel.

There are three pylon designs that will be used for the Mirny project. The types of steel structures that will likely be installed at the Project site are steel Latice 2 poles free-standing structure and three-post lattice free-standing poles and the steel lattice 4 poles, as identified in the following figures.

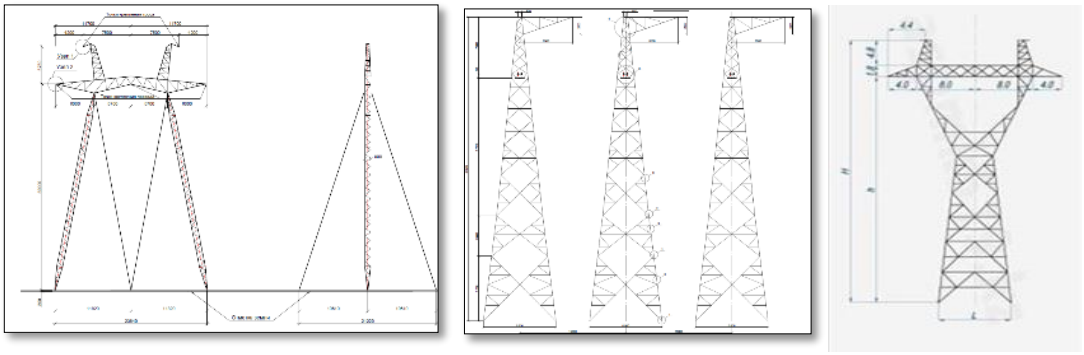

Figure 19: Types of OHTL steel structures planned.

The OHTL construction team will be composed of technicians, engineers and specialized workers to carry out the following works:

- **Preparation**
  - machine preparation (pumps, mud pumps, clean water pumps, mixers, vibrators, rock drills, air compressors, theodolite, total station);
  - material preparation (precast foundation);
  - survey by using a real time kinematic positioning;
  - pit marking by using the theodolite, to measure and mark the dimension line of foundation pit excavation;
  - large size and small size vehicles transport;
- **Excavation**
  - foundation cleaning and mechanical excavation (e.g., mechanical excavation of water and mud pits through pumping or dewatering);
  - mechanical backfilling and layered compaction;
- **Process**
  - tower components assembling and welding on the surface;
- **Tower erection**
  - tightening of all necessary bolts to the ground to reduce the amount of high-altitude work and prevent the tower materials from deforming during lifting;
  - Installation of the components with cranes, lifting and erecting the towers (according to the actual terrain and site conditions, 12t, 25t and 50t cranes are expected to be used for hoisting).

Moreover, about 1000 tons of precast and wires foundations are expected to be used, along with 7000 t of tower materials, 2300 km of Aluminum Conductor Steel Reinforced 400mm², 500 km of Galvanized steel wire and 500 km of Optical Ground Wire plus other consumable material (e.g., plastic tape, fence, nails, bitumen).

Specifically, the installation of steel lattice poles will be carried out using the “rotation” method using tractor with winch, tractor mounted crane using A-shaped erection boom, or auto crane with lifting capacity of 50 tons.

The supporting parts of the mounting boom will be installed in pits 0.3 m deep.

The Contractor will avoid lowering the boom and dismantle the rigging until the pole is securely fastened and will avoid lifting the pole onto foundations not completely covered with soil and not secured against displacement. The Contractor will also ensure that, while lifting the pole, the wind force will be less than 6 points.

2.6.1.7 Roads

The scope of road work includes construction of approximately 155 km of new access roads (about 57 km toward south and 68 km toward north), renovation of about 146 km of access road and construction of about 128 km of onsite roads to connect the WTGs.

The bearing capacity of access roads will be 200 kN/m^2 of new roads will be of 250 kN/m^2.

The following figure details the roads layout.

The roads construction will foresee the following activities:

- site clearing and topsoil removal;
- excavation or levelling and subgrade preparation;
- embankment using material from excavations and/or borrow pits; and
- laying of selected material and road surface finishing.

2.6.2 Construction services

2.6.2.1 Water Supply Management

The Project construction site will need water for construction purposes (i.e., concrete preparation and for machinery and equipment maintenance and cleaning), for feeding the camp (i.e., drinking water and laundry, kitchen and toilets water) and for firefighting.

The construction water pipe, the camp water pipe and the firefighting water pipe will be separately arranged, placed 1m belowground and provided with bituminous epoxy paint for corrosion prevention.

In Mirny village there is a water tower that supplies drinking water to inhabitants twice a week. The water intake extends from Balkhash Lake (35 to 40 km). In winter, interruptions occur due shallow laying of the pipeline (it freezes).

There will be a water intake point, which will uptake from the municipality.

The municipal water will feed the firefighting accumulation tank having a capacity of 150 m^3. There will be a fire hydrant every 50 to 100 m (in any case not more than 120 m). The firefighting independent pipeline will consist of a DN80 polyethylene pipeline provided with a pump at 1 m below the ground level.

The water for drinking purposes will be delivered to the construction site through tanks because the water from the mains is not suitable (i.e., it has poor quality).

The construction water will mainly serve for concrete mixture preparation.

Considering that in the Project site surroundings there are no suitable sources of water of required quantity for preparing concrete mixtures and for technical needs, the Company will drill water wells onsite.

The sourced water from the municipality and the water intake from the wells will be analyzed and, where necessary, will be treated directly onsite.

2.6.2.2 Waste Management

The solid waste generated onsite during the Project construction phase will be accumulated at specific, dedicated locations where it will be segregated per categories. The hazardous solid waste will be placed on paved/waterproofing surfaces under a roofing to prevent the spread of pollutant runoffs during adverse weather conditions.

During the Project construction, the following type of waste will be likely generated:

- non-hazardous recyclable solid waste – packaging materials (paper and cardboard, plastic materials, wooden boards, etc.), wires, steel and iron bars and scraps, welding rods parts, pipes parts;
- non-hazardous non-recyclable waste – construction waste (e.g., bricks, excavated soil and rocks);
- hazardous solid waste – dry batteries, light tubes, empty chemicals bins and cans, oil-containing parts, equipment and machinery parts.

The construction site will likely also generate a large amount of wastewater:

- the process wastewater generated from concrete manufacturing plant;
- the equipment and machinery washing wastewater;
- the stormwater/rainwater;
- the sewage waste;
- the laundry wastewater;
- the kitchen wastewater; and
- the dorms/toilets domestic wastewater.

The Project construction site will be provided with a closed-cycle wastewater treatment plant.

At the time of this ESIA preparation, the Company has no details available regarding the wastewater treatment plant to be built.

The hazardous liquid waste generated onsite, such as oils, fuels, additives, chemicals and lubricant residues, will be segregated per categories. Such residues will be placed in dedicated containers, placed on secondary containment systems or on paved/waterproofing surfaces, under a roofing to prevent the spread of pollutant runoffs during adverse weather conditions.

At the time of this ESIA preparation, no details are available regarding the exact types and amounts of waste expected to be generated for Project construction purpose.

The Company is conducting specific studies to select proper landfills and/or waste treatment/recycling/disposal facilities and waste managers available in the Project site surroundings.

The Ecological Code of Kazakhstan requires that waste should be recovered or disposed of as close as possible to its source. In Zhambyl and Almaty regions, the licensed waste management company Promtechnoresurs /Vitaprom handles most of the waste streams.

It is likely that the Company will either:

- install a composter for food waste;
- opt for a low-air emission alternative (compared to an incinerator) to manage the daily solid domestic waste;

- accumulate onsite the waste and deliver it to Promtechnoresurs/Vitapromevery 1 to 6 months.

The Company will prioritize waste generation prevention, reuse and recycling.

In many rural settlements, including the Moyinkum region, ownerless dumps are used as landfills. The government is currently working to upgrade the municipal landfills to meet the international standards and best practices. The Company will audit the potential landfills.

2.6.2.3 Electrical Installations and Power Supply

During the construction and installation works, the Project is expected to be supplied with electricity from a 35-kW power line and diesel generators (with a capacity of 80÷200 kVA, 1200 kVA (low emission)). Heat will be supplied by heat guns and boiler units with a capacity of 190÷800 kW. During the operation of construction equipment and motor vehicles, diesel fuel consumption is expected to be approximately 53,500 tons and gasoline consumption approximately 530 tons for the entire period of work.

Additionally, the Company is planning to install solar panels on the accommodation building for providing renewable energy.

2.6.2.4 Materials management

The products and materials at the Project construction site will be arranged at specific storages and warehouses.

The Contractor will identify the products and materials arrived on site and send them into the corresponding open storage yards or specific sheds and warehouses (e.g., hazardous chemicals warehouse, spare parts warehouse, welding rods warehouse, pressurized cylinders warehouse, controlled temperature).

During the construction phase, it is planned to use construction materials in approximately the following volumes: sand – about 700 thousand tons, crushed stone – about 602 thousand tons, sand-gravel mixture (SGM) – about 270 thousand tons, soil (imported loam) – about 3,600,000 tons, electrodes – about 3,000 tons, propane-butane mixture – about 10 tons, paints and varnishes – about 75 tons, chemicals (e.g., concrete additives), engines oils and lubricants, fuels, steel and iron, cables and wires, welding rods, argon, oxygen and acetylene gases plus all necessary material for the construction camp's kitchen, laundry, offices and dorms (including camp cleaning products).

Purchasing, logistics and supply chain management

The delivery of equipment, machinery and materials will be made both by rail and by road.

The nearest railway station suitable for performing major unloading operations is Shyganak railway station, 57 km far from Mirny village. There is also a railway connection with Kiyakhty station, which is located at a distance of 13 km from Mirny village and where is a branch, a railway dead end track engaged in transportation of granite.

After unloading the goods at Shyganak station, the Contractor will use the road A-358 for reaching by road the construction site. The A-358 road is used from Shyganak to the turn to Kiyakhty.

The road A-358 can be also used for connections between Shu, Birlik, Khantau, Kiyakhty. Moreover, after turning from Birlik towards Khantau, the unpaved road running along the planned 500 kV OHTL track can be used.

The materials sourced will reach the rail station at the international dry port of Khorgos, which connects land-locked Kazakhstan to China.

Construction inert materials

The Contractor will supply construction inert materials from local quarries.

The sand will be supplied from Voroshilovsky quarry (Zhambyl oblast, Shu district) and the crushed stone will be supplied from Agalatasskoe quarry (Zhambyl oblast, Kordai district). Both quarries have sufficient capacity for production of inert materials and loading equipment, which makes it possible to supply the required volumes for construction.

The transportation of materials from these quarries to the Project site will be made by road or by rail if available.

Transformers and shunt reactors

Heavy, large-sized equipment for substations (i.e., transformers and reactors), disassembled, will be sourced from China, and transported from the Horgos Port located in Xinjiang, China, on low bed trucks and trailer train to Khorgos station and then to the Project construction site.

The substations, during their transportation, will need to pass through 2 bridges (including 1 over-railway bridge), through overpasses, and through 2 OHTL.

The grid will be linked to the WTGs with two 33/500kV step-up main substations (North & South Substation) The North Substation will have two (2) power transformers and South Substation will incorporate three (3) power transformers , including the shunt reactors and the all the associated electrical equipment.

The material will be at first transported from Xi'an (China) to Khorgos (Kazakhstan) by Chinese trucks, then, the cargo will be moved on Kazakh trailers and transported to the Project site via Kazakhstan.

The transportation distance from Xi'an to Khorgos is about 3300km, while the distance from Khorgos to the Project site is about 700km.

The transportation means will be MAN truck heads (MAN TGA 33.430 BB of 6 x 6 and MAN TGA 33.410 of 6 x 4), Goldhofer THP/SL Hydraulic trailers with 4 and 6 axle units.

Figure 20: MAN truck heads.

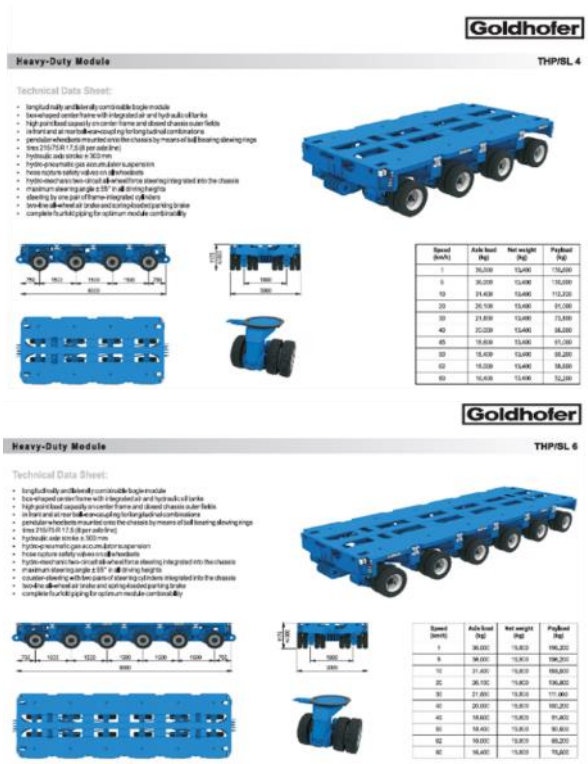

Figure 21: Hydraulic trailers with 4 and 6 axle units.

From Khorgos to the Project site the distance is about 700km.

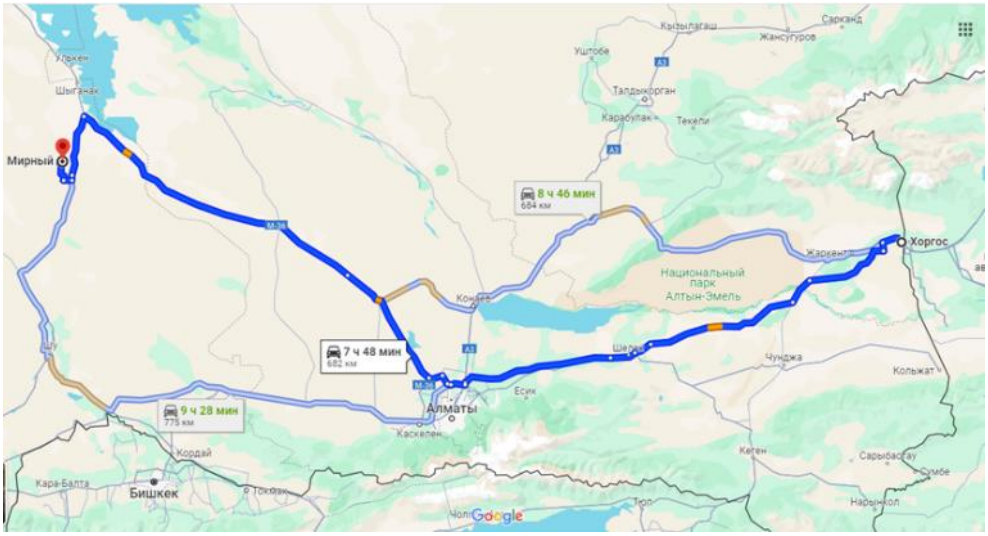

Figure 22: Transportation of transformers and reactors with low bed trucks and trailer train from Khorgos station.

The transformers and shunt reactors will be supplied partially filled with oil under nitrogen. The transformer oil for refilling, the high-voltage bushings, the control system, the cooling system and other parts will be supplied separately.

The loading and unloading operations of transformers and reactors will be carried out using rigging method, with 200 tons lifting capacity crane. Once transformers, reactors and parts are delivered by means of low bed

trucks or trailer train to the substations construction areas, these are unloaded onto grating and then installed on the foundation.

For the rest of electrical equipment, the loading and unloading operations will be carried out by means of truck cranes with lifting capacity of 25-80 tons.

OHTL materials

The materials for building the OHTL will be sourced from Anhui and Jiangsu provinces of China.

From China, the material will be delivered at the port of Khorgos and then to the Project site. The vehicles will go through three customs zones, the domestic Khorgos export declaration, the Kazakhstan transit declaration and the Kazakhstan import declaration.

The foundations and the metal poles of the 500 kV OHTL will be delivered by railways from Taldykorgan station or by road. Part of the load will be unloaded at Shu station and part at Shyganak station. The Company is also considering the dead-end track from Kiyakhty station.

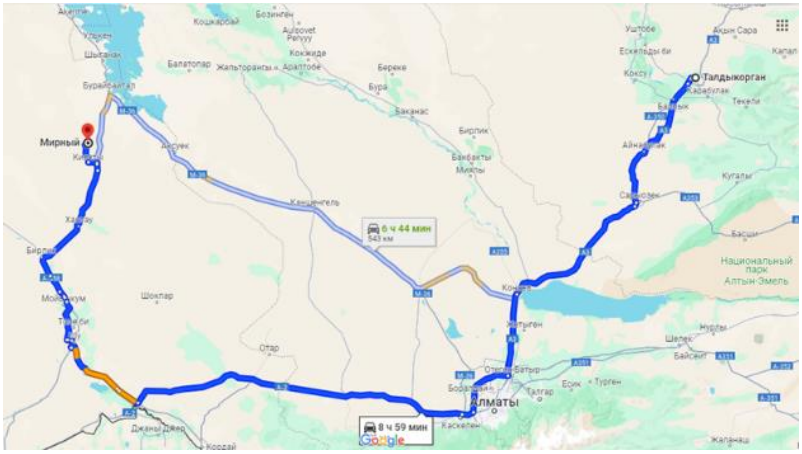

Figure 23: Transportation of foundations and 500kV OHTL metal poles via railways from Taldykorgan station.

Steel-supported aluminum conductors will be delivered via railway road from Pavlodar station. As before, part of the load will be unloaded at Shu station and part at Shyganak station. The Company is also considering the dead-end track from Kiyakhty station.

Figure 24: Transportation of aluminum conductors steel supported from Pavlodar station to Shu station.

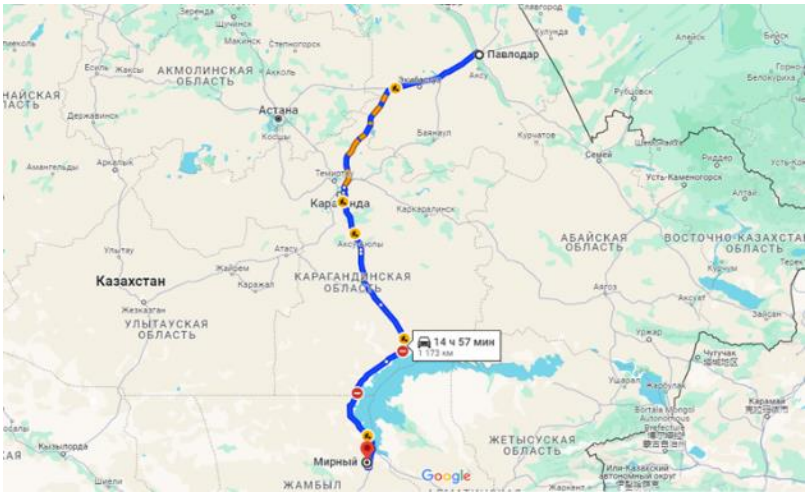

Figure 25: Transportation of aluminum conductors steel supported from Pavlodar station to Shyganak station (or Kiyakhty station).

The equipment, machinery, materials and parts will be accurately checked when delivered and well packed and labeled while storing them so that they will be protected from damage and deterioration. The packages will be, moisture, vermin and fungae proof. Each component will be clearly marked and stored on proper racks or surfaces.

2.6.2.5 Workforce Management

The Project is expected to create approximately 2,000 jobs during construction phase. Local workforce will be highly preferred, and it is estimated that during pre-construction and during all period of construction phase 20% of Full Time Employee (FTE) will be local workforce hired to work in senior, supervisory, and skilled positions (against available position). The planned percentage growth of the local female workforce across various skilled positions is set at 2% per quarter over a one-year period during construction.

At the time of writing this Project Description no additional information on the Project workforce are available (eg. number of skilled vs unskilled job position, number of local vs. foreign workforce).

The Company will follow up with the workers hiring as per the Project standards and requirements.

Regarding the workforce health and safety, for major emergency situations, the Project site will be served by Moyinkum hospital, 2 hours away. Additionally, there will be an onsite clinic with available medical personnel.

2.6.2.6 Security Management

The Project construction site will be fenced and illuminated at night.

The office area and the dorms will be under security control.

Properly qualified local security personnel will be hired to prevent unauthorized access of people, disputes, conflicts and other security incidents. The guards will be responsible for camp area security works, to control people and machine mobilization, to ensure there is no fighting and gambling. All security personnel will be unarmed and required to undertake specialized trainings.

Moreover, there will be an onsite representative to be in charge of liaise with State Security authorities.

There will be a Security Control Room serving as interface between the Company and the Government Security Forces. Such Security Control Room will allow the control and coordination of security teams 24/7.

The access to- and the exit from the site will be controlled and will undergo specific permits.

2.6.2.7 Road Traffic Management

Road traffic will likely increase in certain periods during the construction phase.

The Contractor will develop a Traffic and Transport Plan before commencement of any transportation activities to ensure that the transportation process is properly and adequately managed and does not pose a risk of damage to the existing roads, highways, overpasses whilst ensuring public safety. The Plan will analyse and study the entire route for transportation of the Project components.

There will be personnel dedicated to the traffic management to prevent road/transportation accidents and develop an effective safety management system and contingency plan.

The traffic management will foresee the control and supervision of the vehicles, of the drivers' registrations/authorizations, of the site accesses, of the Project site surrounding roads and of the equipment and materials and dangerous goods transportation.

The construction passageways will be kept unobstructed and there will be no mud in rainy season and large water ponds.

The Project foresees the roads restoration in case of issues.

Onsite and offsite safety warning signs will be posted.

2.6.2.8 Machinery and Equipment

The following table lists the construction machinery & equipment expected to be used onsite for Project construction purposes.

Table 5: Road construction machinery & equipment.

Ref	Description of machinery and equipment	Estimated Number
1	Crawler Excavator from 30-50ton	10
2	Excavator with hydraulic hammer	6
3	Backhoe	10
4	Bulldozer	6
5	Grader	4
6	Mobile Truck with mounted Telescopic boom crane (10ton to 15ton)	4
7	Low-bed Trailer (over 30ton)	20
8	Dump truck (12 to 18 m3)	50
9	Cargo bed truck semitrailer	12
10	Cargo nacelle / hub transport trailer	10
11	Tower transport trailer	50
12	Cargo superwing carrier for blades	18
13	Water truck (from 8 to 15m3)	6
14	Complete batching plant (100 to 130m3 / hour)	3
15	Concrete hellicopter	6
16	Steel Cable Prestressed tool	2
17	Silo for cement storage	3
18	Flushing cement mortar equipment	3

19	Mobile Laboratory for test	1
20	Water threatment plant	2
21	Mobile Crusher plant	5
22	Concrete pump (80 to 150m3 / hout)	7
23	Front-end loader	8
24	Concrete Vibrator	10
25	Total station	6
26	Mobile canteen	5
27	Road roller	8
28	Vibratory plate compactor	12
29	Forklift	6
30	Sewage cesspool tank	2
31	Fuelling truck	3
32	Lifter nacelle	6
33	Rock Drilling machine	5
34	Specialized truck for explosive transport materials	1
35	Specialized van for explosive transportation	1
36	Compressor	7
37	Mobile diesel light towers	20
38	Mobile Diesel generator unit (25 to 150kVA)	20
39	Fix Diesel generator unit (100 to 200kVA)	15
40	Mobile welding machines	6
41	Bus / Van	20
42	Car Vehicles	20
43	Fenced Fueling Tank Storage facility	1
44	Fenced explosive Storage facility	1
45	Reinforcement steel work shop (bending, cutting machinery, etc)	3
46	Mechanical maintenance workshop (associated equipment & tools)	2
47	Store room containers	20
48	Portable hand tools for testing (different electrical testing equipment)	8
49	Mobile Fire extinguisher equipment	TBD
50	Permanent Fire extinguisher equipment	TBD
51	Safety protection equipment	TBD
52	Set of formwork	TBD
53	Set of scaffolding	TBD
54	Woodworking Saw Machine	10
55	Woodworking planer	10
56	Trenching machine	3
57	Mud pump and set of piping / valves accessories	4
58	Water pump and set of piping / valves accessories	8
59	Crawler crane 1000 - 800ton	4
60	Crawler crane 200 - 150ton	6

61	Mobile crane 200 - 150ton	4
62	Mobile crane 100 - 80ton	10
63	Mobile crane 300ton	4
64	Mobile Crane (25-30ton)	8
65	Electric winch	5
66	Hydraulic lifter	5
67	Hydraulic jacks	12
68	Dynamic / Static Plate load test equipment	5

The construction site will be provided with maintenance stations and tools to allow the construction site workers conducting proper maintenance and control on equipment and machinery.

The tools that will be provided will consist of hand tools and power tools, such as cutters, drills, hammers, ladders and collective and personal protective equipment.

2.7 Project Operation

2.7.1 Operation activities

Wind plants generally require limited operational activities as this mainly includes the following:

- commissioning tests;
- normal daily operation;
- maintenance and control.

The Project site will include the substations, the WTGs, the BESS and the compound.

The compound will be placed on central North area, to optimize and minimize transport on site.

The compound will include the offices, an accommodation camp, a site infirmary, workshops, storages and parking lots. For major emergency situations, the Project site will be served by Moyinkum hospital, 2 hours away. Additionally, there will be an onsite clinic with available medical personnel.

The workers' accommodations will be placed in a matter that would prevent any adverse noise impacts.

Table 6: Project site operation camp features.

no.	Name	Quantity
1	One-story office for 50 workspaces, S=1360 m²	1
2	One-story dormitory for 58 workers, S=583.4 m²	1
3	One-story dormitory for engineering and technical staff for 50 people, S=583.4 m²	1
4	Dining hall for 100 people, S=512.3 m²	1
5	Vegetable and grocery storage, S=113.77 m²	1
6	Laundry, S=193 m²	1
7	Container-type refrigeration chambers, total S=52.54 m²	2
8	Guard post (Checkpoint), total S=8.75 m²	2
9	Underground septic tank 70 m³	2
10	Biotoilet, S=2.25 m²	4
11	Drinking water storage tank 70 m³	1

no.	Name	Quantity
12	Modular drinking water pump station, total S=20 m²	1
13	Container for diesel generator 1000 kVA	1
14	Fuel tank 6 m³	1
15	Fire water reservoir 80 m³	1
16	Parking for cars (area included in the total road area)	for 12 cars
17	Waste container site, total S=47 m²	1
18	Sports complex + minibar, S=435.9 m²	1
19	Medical point, total S=19 m²	1
20	Classroom, S=40.3 m²	1
21	Container-toilet, S=4.5 m²	1
22	Heated warehouse, S=705.4 m²	4
23	Cold warehouse, S=705.4 m²	1
24	Special equipment parking, S=500 m²	1
25	Inspection and repair site for special equipment, S=200 m²	1
26	Transformer substation 1000 kVA	1
27	Containerized fuel station with one fuel dispenser and a 40 m³ fuel storage container	1
28	Volleyball court	1
	Roads (width 3.5 m) made of reinforced concrete slabs (total area)	1671 m²
	Roads (width 6 m) made of reinforced concrete slabs 2x6 m + parking	4105 m²
	Outer fence	628 m
	Inner fence	386 m

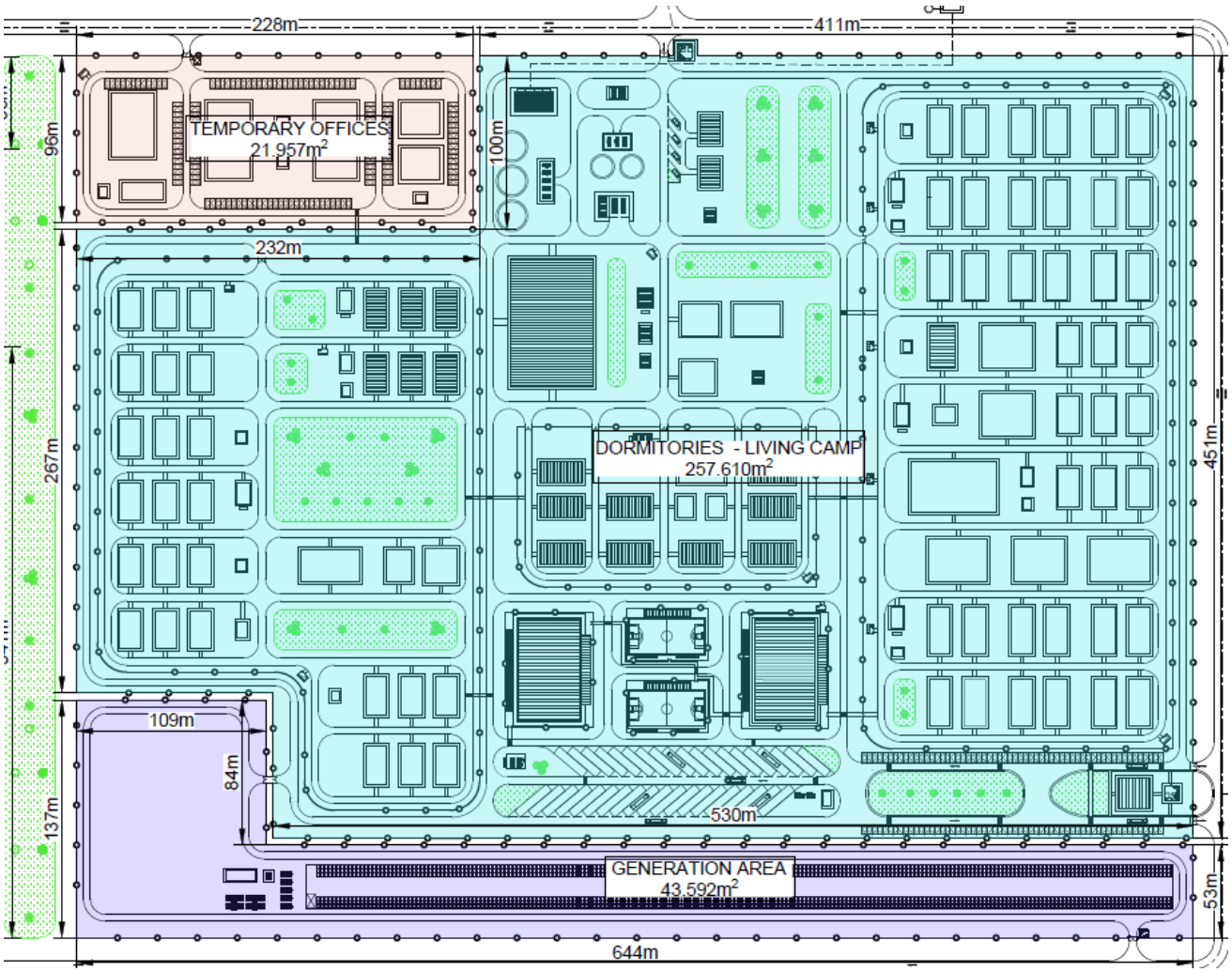

Figure 26: Project site workers camp (blue area).

Table 7: Project site workers' camp features.

no.	Name	Quantity
1	One-story office for 65 workspaces, S=1483.2 m²	1
2	Two-story dormitory for 115 workers, S=1483.2 m²	3
3	One-story dormitory for engineering and technical staff for 65 people, S=583.4 m²	1
4	Dining hall for 300 people, S=1064.55 m²	1
5	Vegetable and grocery storage, S=113.77 m²	1
6	Laundry, S=193 m²	1
7	Container-type refrigeration chambers, total S=52.54 m²	2
8	Guard post (Checkpoint), S=8.75 m²	2
9	Underground septic tank 120 m³	2
10	Biotoilet, S=2.25 m²	4
11	Drinking water storage tank 120 m³	1
12	Modular drinking water pump station, S=20 m²	1
13	Container for diesel generator 1000 kVA	1
14	Fuel tank 6 m³	1

no.	Name	Quantity
15	Fire water reservoir 50 m³	1
16	Parking for cars (area included in the total road area)	for 12 cars
17	Waste container site, S=47 m²	1
18	Sports complex + minibar, S=435.9 m²	1
19	Medical point, S=19 m²	1
20	Classroom, S=40.3 m²	1
21	Container-toilet, S=4.5 m²	1
22	Heated warehouse, S=705.4 m²	4
23	Cold warehouse, S=705.4 m²	1
24	Special equipment parking, S=500 m²	1
25	Inspection and repair site for special equipment, S=200 m²	1
26	Transformer substation 1000 kVA	1
27	Containerized fuel station with one fuel dispenser and a 40 m³ fuel storage container	1
28	Volleyball court	1
	Roads (width 3.5 m) made of reinforced concrete slabs (total area)	2981 m²
	Roads (width 6 m) made of reinforced concrete slabs 2x6 m + parking	4369 m²
	Outer fence	764 m
	Inner fence	359 m

2.7.2 Operation services

2.7.2.1 Water Supply Management

Process water onsite will serve for the Project services (e.g., maintenance), cleaning and firefighting.

Moreover, potable water will be necessary for feeding the toilets and the kitchen.

The estimated quantity of domestic water needed is of about 30 liters/day/person.

The WPP will be provided with permanent firefighting stations, which will be located at both the substations. The firefighting stations will be likely fed by water from the wells.

The onsite ion-lithium batteries will need water, which will be as well provided from the wells.

The Company planned to collect and reuse the rainwater through water towers to mitigate the water impact on the area.

2.7.2.2 Waste Management

The solid waste generated onsite during the Project operation phase will be accumulated at specific, dedicated locations where it will be segregated per categories. The hazardous solid waste will be placed on paved/waterproofing surfaces under a roofing to prevent the spread of pollutant runoffs during adverse weather conditions.

At the time of this ESIA preparation, no details are available regarding the exact types and amounts of waste expected to be generated for Project operation purpose.

The following type of waste will be likely generated:

- non-hazardous recyclable solid waste – packaging materials (paper and cardboard, plastic materials, wooden boards, etc.) and steel and iron scraps, etc.;
- non-hazardous non-recyclable waste – cables and wires, etc.;
- hazardous solid waste – dry batteries, empty chemicals bins and cans, oil-containing parts, equipment and machinery parts, etc..

The operations will also generate wastewater:

- the process wastewater generated from maintenance activities;
- the equipment and machinery washing wastewater;
- the stormwater/rainwater;
- the sewage waste;
- the laundry wastewater;
- the kitchen wastewater;
- the dorms/toilets domestic wastewater.

At the time of this ESIA preparation, the Company has no details available regarding the installation of a wastewater treatment plant.

The hazardous liquid waste generated onsite, such as oils, fuels, additives, chemicals and lubricant residues, will be segregated per categories. Such residues will be placed in dedicated containers, placed on secondary containment systems or on paved/waterproofing surfaces, under a roofing to prevent the spread of pollutant runoffs during adverse weather conditions.

The Company is conducting specific studies to select proper landfills and/or waste treatment/recycling/disposal facilities and waste managers available in the Project site surroundings.

The Ecological Code of Kazakhstan requires that waste should be recovered or disposed of as close as possible to its source. In Zhambyl and Almaty regions, the licensed waste management company Promtechnoresurs/Vitaprom handles most of the waste streams.

It is likely that the Company will either:

- install a composter for food waste;
- opt for a low-air emission alternative (compared to an incinerator) to manage the daily solid domestic waste;
- accumulate onsite the waste and deliver it to Promtechnoresurs/Vitaprom every 1 to 6 months;

The Company will prioritize waste generation prevention, reuse and recycling.

2.7.2.3 Electrical Installations and Power Supply

During operation, the facility will be supplied with electricity from existing power grids, and in case of a power outage, there are 3 emergency diesel generators with a capacity of 1200 kVA (low emission) and two emergency generators with a capacity of 750 kW (one working + one reserve), as well as reserve diesel generators with a capacity of 10 kW.

Fuel consumption for motor vehicles is estimated at: diesel fuel - 2186.01 tons, gasoline 262.80 tons.

2.7.2.4 Materials management

At the time of this ESIA preparation, no details are available regarding the specific materials which will be used for operation purposes and their quantities. However few materials are expected to be used for maintenance purposes and they will be stored in specific storages and warehouses.

The appointed site personnel will identify the products and materials arrived on site and send them into the corresponding open storage yards or specific sheds and warehouses.

2.7.2.5 Purchasing, logistics and supply chain management

The delivery of equipment, machinery and materials will be made both by rail and by road, as per the construction phase.

For the operations, will be used the roads built during the construction phase.

At the time of this ESIA preparation, no details are available regarding the major materials providers.

2.7.2.6 Workforce Management

The Company will have an HR department dedicated to managing the personnel.

Relating to the hiring strategy, preference will be given to workers from neighboring areas, depending on the availability of suitable qualifications. The workers coming from abroad will be mainly Chinese. Mirny village is not expected to be a major workforce source because of its small population.

Including both permanent and seasonal workers, white and blue collars, onsite there will be about 200 workers (including workers dedicated to cleaning activities). The permanent employees on site are expected to be approximately 20, including supervisors, administrative personnel and maintenance personnel.

The personnel will operate on 3 shifts, with a shift change every 1-2 days. There will be a personnel rotation of 15 days. The following table details the personnel roles and responsibilities.

Table 8: WPP permanent personnel.

Position	Team	Staff	Tasks
Webmaster	Supervision Team	1	Overall responsibility and coordination for station operation and maintenance
Technical Responsible	Supervision Group	1	Technical and safety management general manager
Monitor	Maintenance Team 1	1	Maintenance duty officer
Technician	Maintenance Team 1	1	Maintenance and defect handling, inspection and supervision records
Maintenance personnel	Maintenance Team 1	3	Electrical equipment and line maintenance and defect handling
Monitor	Maintenance Team 2	1	Maintenance duty officer
Technician	Maintenance Team 2	1	Maintenance and defect handling, inspection and supervision records

Maintenance personnel	Maintenance Team 2	3	Electrical equipment and line maintenance and defect handling
Monitor	Maintenance Team 3	1	Maintenance duty officer
Technician	Maintenance Team 3	1	Maintenance and defect handling, inspection and supervision records
Maintenance personnel	Maintenance Team 3	3	Electrical equipment and line maintenance and defect handling
Support staff		2	Board and lodging for on-duty and maintenance personnel in the station
Cleaners		1	Responsible for cleaning and sanitation in the area

2.7.2.7 Security Management

On site there will be full-time security personnel in charge of:

- anti-theft alarms and devices management;
- entry and exit control systems management;
- project site perimeter control;
- gates locking and opening.

Specifically, the Company will appoint an onsite representative to be in charge of liaise with State Security authorities.

A specialized security company will be contracted.

The Security Control Room will be the interface between the Company and the Government Security Forces. Such Security Control Room will allow the control and coordination of security teams 24/7.

Unauthorized personnel and outsiders will go through relevant procedures and will register and enter only after proper verifications and issue of authorizations.

Occasional visitors will be accompanied and supervised by the site personnel.

2.7.2.8 Road Traffic Management

The Project area and its surroundings will be served by additional roads after the end of construction (as detailed in 2.4 and 2.6.1.7).

During the operation phase, the traffic will be predominantly generated by operation and maintenance purposes.

The Company will develop a Traffic Plan to ensure that the vehicles moving in and out of the Project site will comply with the Project standards.

Safety warning signs will be posted at the new roads and the site accesses.

2.7.2.9 Machinery and Equipment

The Company is actively working, together with the equipment and machinery providers, on detailed plans for maintenance and control on machinery and equipment during the operation phase.

The plans will be drafted for all plants and components operating on site.

The tests and inspections will depend on the equipment and machinery and will be of various type (e.g., shift inspections, periodical general inspections, comprehensive inspections, night inspections).

Licensed and qualified technical personnel will conduct the inspections on daily, weekly and monthly bases, as needed/planned.

Additional inspections will be conducted, when necessary, in case of, for example, breaks, adverse weather conditions, equipment overloading, defects or accidents.

The inspections will comply with the Project standards and the sector-specific local and international laws and regulations and will be recorded.

2.8 Project Decommissioning

The operational life of a wind power plant is typically 25-30 years; the approximate date for the decommissioning/re-equipment of the facility is 2054. At the end of this stage the Company will assess the necessity of decommissioning.

The Company will option for one of the following options for the final stage:

- full or partial removal;
- full or partial repower by replacing old generating assets with next-generation technology; and
- life extension by conducting minor and low-cost but frequent repairs.

Fully decommissioning and removing a WPP mainly consist of dismantling the turbines and the components and clean-up/restoring the site.

The Project operation phase will not likely involve the use of large volumes of hazardous materials; therefore, given the planned proper management of materials, a post-operational clean-up (for potential releases of harmful materials) should not be necessary.

The decommissioning will be conducted in a safe manner, by applying environmental measures compliant with the Project standards and the legislation in-force at the decommissioning time.

The Project is expected to be operational for 25 to 30 years. Following this time frame, the Project could be decommissioned.

The full decommissioning would imply the removal of all above-ground infrastructure (e.g., substations, wires, buildings, fencing, and access roads) and of all/most of below-ground infrastructure (e.g., foundation and wiring). Following the removal, the Company will conduct the equipment and machinery disassembly into components for final disposal or possibly for reuse, recycle or refurbishment.

In fact, most part of the Project infrastructure, like overhead lines, underground lines, and substations, may be reused when decommissioned turbines are removed.

After decommissioning, the access roads will be kept, while the area – once the structures are removed – will undergo land restoration. The amount of topsoil used for backfilling/restoring the site will be consistent with the soil excavated.

2.9 Project Area of Influence

The Applicable standards require that Project proponents identify and manage environmental and social risks and impacts within the Project “Area of Influence” (AoI). The appropriate level of assessment and management

of risks and impacts is determined by the degree of control that the proponent is able to exercise over the Project facilities or activities and by the importance of the facilities or activities to the Project's successful operation.

IFC PS1 par. 8 requires that: "*Where the project involves specifically identified physical elements, aspects, and facilities that are likely to generate impacts, environmental and social risks and impacts will be identified in the context of the project's area of influence. This area of influence encompasses, as appropriate: 1) The area likely to be affected by: (i) the project and the client's activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project; (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent; 2) Associated facilities, which are facilities that are not funded as part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable. 3) Cumulative impacts that resu*".

The AoI of this Project is delineated as a basis for defining the minimum boundaries for baseline data gathering by taking into consideration the spatial extent of the facilities and activities and potential direct. indirect and cumulative impacts of the Project, including:

- a 10 km radius around the Project footprint for physical components (soil, air, water, noise, shadow flicker). 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);
- a 10 km radius around the Project footprint for social components (communities, generation of traffic, workforce and security). 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;
- a 70 km radius around the Project footprint to assess potential impacts on biodiversity, cumulative impacts.

The physical, social and biological aspects of the Project AoI are detailed in the baseline chapters.

As per IFC PS1 par 8. there are no associated facilities for the Mirny Project; indeed, the BESS, the access roads and OHTL are all facilities funded by the Project therefore not considerable as associated.

wsp.com