5 PROJECT ALTERNATIVES AND ENVIRONMENTAL AND SOCIAL CONSIDERATIONS

5.1 Introduction

This section provides an overview of the project alternatives considered for the project including alternative power generation, site selection, technology and locations. This data was provided by IEAD.

5.2 No Project Alternative

The 'no project alternative' considers the consequences in case a decision not to proceed with the Project is made. In this scenario, the possible positive and negative impacts of the proposed activities on the receiving environment and social receptors would not occur.

Specific benefits of the no project alternative are considered to be the following:

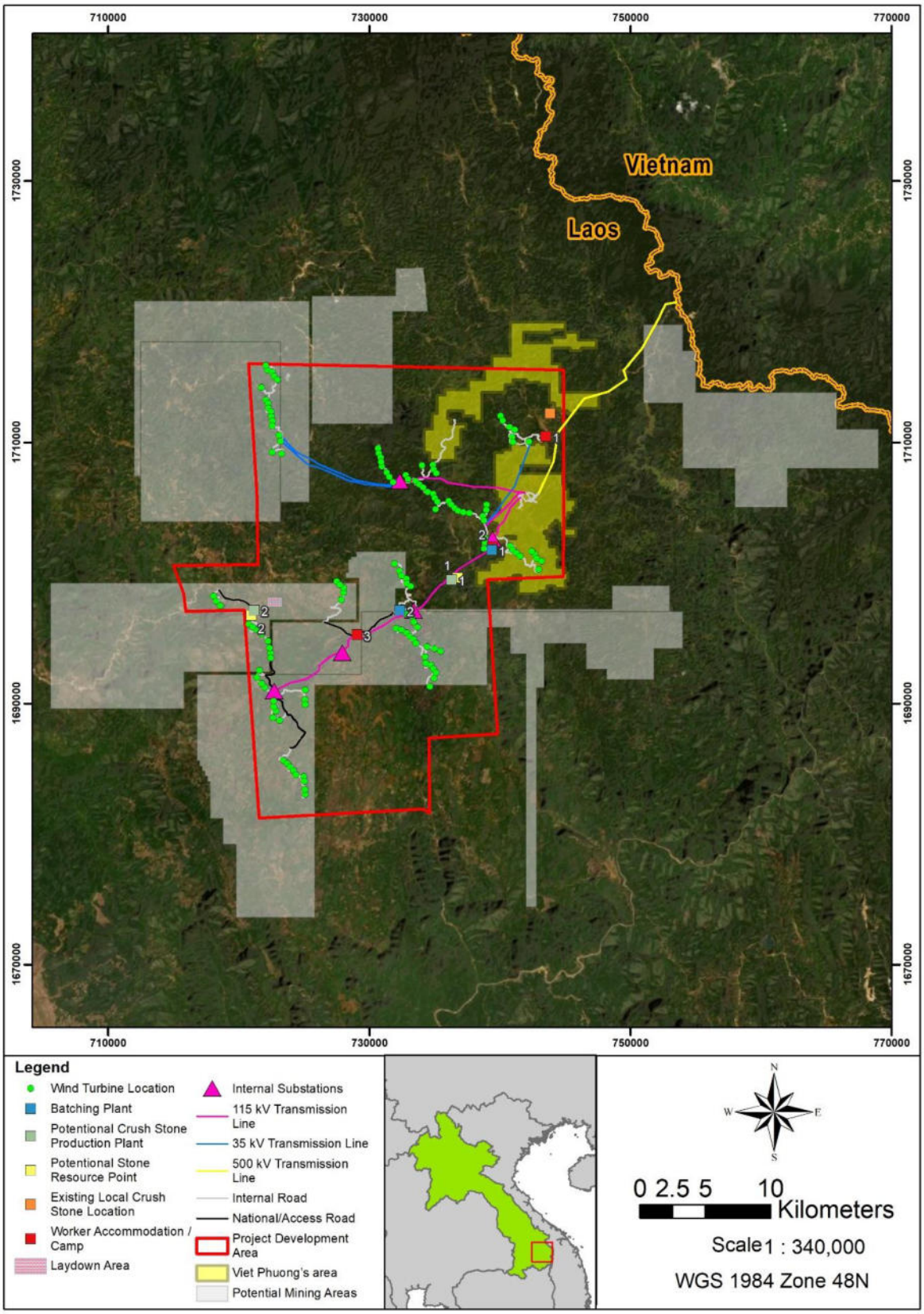
- The constructing of the Project, including the construction of the batching plant, transmission lines and internal roads will have the adverse impacts on the environment e.g., dust emission, contamination of soil and surface water, and to biodiversity habitats e.g., permanent and temporary loss of habitats;
- The possible social disruption and health impacts arising from the construction and operational activities; e.g., impacts to health and safety of community, unplanned events, loss of land and structure, loss of ecosystem services which they depend on, and change of landscape, would be avoided;
- The land at the proposed sites would be unaltered and remain available for alternative use.

In case that the Project is not developed (No Project Scenario) there will be no impacts to villages within the Project boundary e.g. loss of land and structure, loss of ecosystem services which they depend on, change of landscape, etc.

Conversely, the disadvantages of the no project alternative are as follows:

- It is noted that the Project area is located in a known potential mining area (as shown in ***Figure 5-1***). However, all potential mining areas with the exception of Viet Phuong are in early stages of development and have not exceeded the MoU phase. Should the project not be developed, the Project Area could be used for mining which would have larger environmental and social impacts to the surrounding communities and environment. However, it should be noted that the development of the Project does not restrict the possibility of mining concessions in the neighboring areas outside of the Project Area.
- Development of local socio-economics and its positive benefits would not be realized e.g. increase in employment rate, and increased access to electricity, improved roads, improved facilities such as schools, healthcare facilities, clean water system and potential increase in tourism in the area due to wind farm development which is a novel development in Lao PDR.
- Not developing this Project may result in the need to establish alternative plants using other energy and fuel sources e.g., hydroelectric, gas-fired, or coal-fired. These alternatives would have greater adverse impacts from increased greenhouse gas emissions during operation phase of the Project.

Figure 5-1: Potential Mining Areas



5.3 Alternatives on Wind Turbine and Facilities Layout

From data provided by IEAD, it is noted that the turbine layout has been optimised from 240 turbines to 133 turbines. The number of turbines have been reduced due to new the use of turbine technology that can generate more power.

The following process has been conducted to refine the wind turbine layout for the Project:

- IEAD has been considering turbine layout based on turbine technology available since 2014. Total 240 WTGs (x2.5MW) with 139m hub height and 120m rotor diameter, was considered based on wind turbine technology available in 2014-2015. The layout was included in the feasibility study that was approved by Government of Laos and it was included in the first draft of local EIA submitted to the Government of Laos.
- Following this, a total of 174 WTGs (x3.45MW) with 157m hub height and 136m rotor diameter was selected in 2016 due to changes in the Project design.
- In 2020, a total of 113 WTGs (x5.3MW) with 141m hub height and 158m rotor diameter was considered. Larger WTGs were proposed to reduce the number of turbine units and reduce the ancillary infrastructure (i.e. road and civil foundation). However, the solution was considered infeasible and could not achieve targeted energy yields.
- In 2021, according to new technology available and achieving targeted economic return such as environment for physical& biodiversity, health, social aspects, the final selected layout included a total of 148 WTGs. This has been considered in this ESIA.
- In 2022, IEAD has changed layout from Goldwind's technology (148 turbines) to Envision's technology (133 turbines). Envision layout has reduced 15 turbines and 124 turbines out of the 133 turbines are in the same area. Only 9 turbines are planned to be relocated to Dak Nong Village, which used to be the location for the 115kV transmission line and access road for Goldwind layout. The Goldwind and Envision's layout comparison is shown in ***Figure 5-2.*** Land cover data for comparing Goldwind and Envision's layout from secondary data sources for protected and key biodiversity areas and from the Regional Land Cover Monitoring System (RLCMS) that was developed by SERVIR-Mekong. This data was extrapolated to calculate the land cover in terms of land use categories. This data is provided in *Error! Reference source not found.*.

Option 2 was selected for the Project.

Table 5-1: Land Cover for Turbine Layout

Land Cover Category	Goldwind	Envision
	Area (sq.m.)	Area (sq.m.)
Agriculture/Aquaculture	1,963.50	0
Forest	253,290.81	239,546.27
Key Biodiversity Area	35,342.92	21,598.45
Protected Area	0	0
Shrub-land	0	0
Urban and Built Up	0	0
TOTAL	**290,597.23**	**261,144.72**

Source: RLCMS - (https://www.landcovermapping.org/en/landcover/#)

- Previously, Goldwind's technology (148 turbines) impacted a total of 246 HHs with a total loss of 130.47 ha of agricultural land (5.4 ha permanently affected and 125.07 temporarily affected) and

593.03 ha of NTFP collection area (153.05 ha permanently affected and 439.98 ha temporary affected) and overlap with 5 cemeteries and Phou Koungking Mountain.

- The layout optimisation to Envision's technology (133 turbines) has resulted in 378 affected HHs, 185.83 ha of agricultural land loss (29.31 ha permanently affected and 156.53 ha of temporarily affected, 535.48 ha NTFP collection area loss (150.79 ha permanently affected and 384.69 ha temporarily affected), 608.93 ha of communal land loss (160.37 ha permanently affected and 448.56 ha temporarily affected) and Phou Koungking Mountain. It is noted by the site team (Innogreen) that increased agricultural activities were observed during DMS survey in May – June 2022 compared to November – December 2021 when the asset registration survey was conducted. This may contribute to increased number of affected HHs and area of impacts despite the number of WTGs have been reduced from 148 to 133 WTGs.
- Envision layout also avoids impacts to all cemeteries; however, overhead transmission line will pass over Dak Bong cemetery. It is noted that the transmission line is 70 m above the ground and no physical impacts (e.g. land clearance, earthwork, etc.) will be made Dak Bong cemetery area. The consultation with Dak Bong village on 21 July 2022 suggested that cutting of trees within ROW in cemetery area to maintain the tree height under 3 m[21] is allowed; however, the Project is required to provide budget for the village to prepare and perform specific rituals to seek permission from spirits for such activities.

It should be noted that there is no change in the overall Project development area; all WTGs are located within this development area.

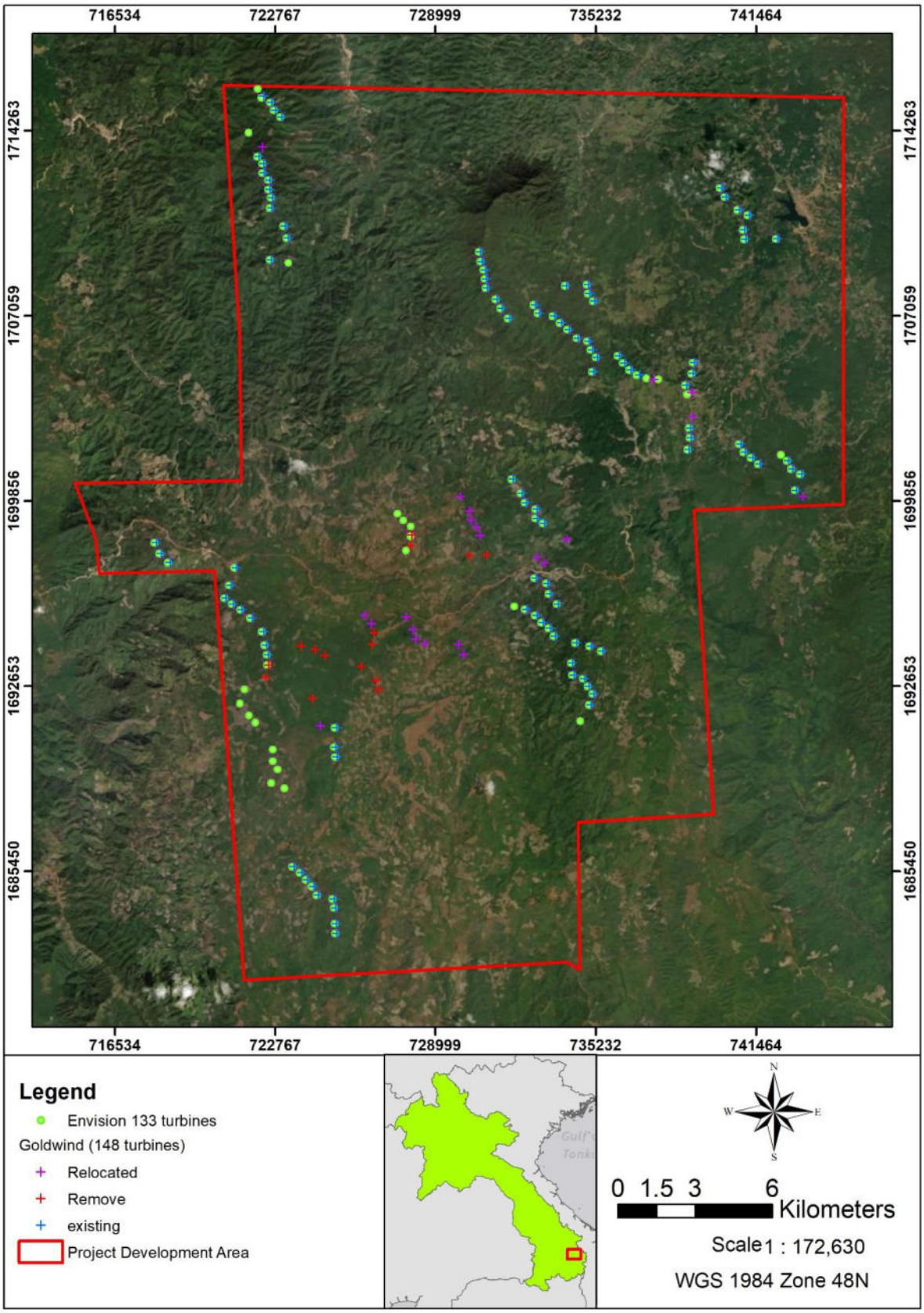
In addition, through the ESIA process, re-routing of facilities has been conducted in order to reduce impacts on environmental and social receptors, this has included:

- Re-routing of the access roads and internal transmission lines was conducted to avoid cemetery areas (all cemetery area in the development area);

Relocating WTGs to avoid significant shadow flicker and noise impacts (Dak Yan and Dak Cheung Village) – WTGs moved from approximately 200m from village to over 1 km For information on the considerations given to the layout of the turbines in relation to the biodiversity and capacity requirements, refer to ***Section 9.4.3***.

[21] The Regulation on Safety for High Voltage Transmission Line and Substation, EDL/ 2013 prescribes that trees taller than 3 m are prohibited within the ROW area. Therefore, there is a need for the Project or relevant authority to maintain the height of trees under 3 m.

Figure 5-2: Goldwind and Envision's layout comparison



5.4 Alternatives on Transmission Line Route

5.4.1 Alternative Sub-Station Locations

- **Option 1**: prior to the decision to export the electricity to Vietnam, the Project considered the transmission line was to connect the Project via a 150 km 230kV transmission line to the Ban Lak 25 substation in in Pakse, Champasak Province. This routing intersects with two Key Biodiversity Areas (KBAs) (as shown in ***Figure 5-3***). The plan was amended in order to connect to a 500 kV station of Vietnam (Thanh My Station) with an overall length of 66 km (around 22 km in Laos). The Laos to Vietnam option reduces the overall potential for impacts from forest clearing, impacts to agricultural land and livelihoods, and potential increased physical displacement. Two alternative alignments for the 500 kV transmission line were considered in the local EIA (Innogreen, 2022).
- **Option 2:** The plan was amended in order to connect to a 500 kV station of Vietnam (Thanh My Station) with an overall length of 66 km (around 21 km in Laos). This option reduces the overall length of the transmission line from 150 km to 66 km. The Laos to Vietnam option reduces the overall land required as well as number of new towers to be constructed and access roads to be developed and therefore may lead to an overall reduced impacts from forest clearing, impacts to agricultural land and livelihoods, and potential increased physical displacement given the shorter distance.

Land cover data was available for the two optional transmission line routes and ROW from secondary data sources for protected and key biodiversity areas and from the Regional Land Cover Monitoring System (RLCMS) that was developed by SERVIR-Mekong. This data was extrapolated to calculate the land cover for the two optional routes in terms of land use categories. This data is provided in *Error! Reference source not found.*.

Option 2 was selected for the Project.

In addition, through the ESIA process, re-routing of facilities has been conducted to reduce impacts on environmental and social receptors, this has included:

- Re-routing of the access roads and internal transmission lines was conducted to avoid cemetery areas (all cemetery area in the development area)
- In July 2022, transmission line route and 500 kV substation have been slightly adjusted to avoid four (4) permanent residential buildings.

Table 5-2: Land Cover for Alternative Transmission Line Routes

Land Cover Category	Option 1		Option 2	
	Area (sq.m.)	Length (km)	Area (sq.m.)	Length (km)
Agriculture/Aquaculture	134,241	2.27	0	0
Forest	6,648,337	110.87	1,122,854	18.69
Key Biodiversity Area	1,794,843	29.92	156,129	2.59
Protected Area	21,287	0.35	0	0
Shrub-land	158,224	2.63	0	0
Urban and Built Up	208,737	3.62	0	0
TOTAL	**8,965,669**	**150**	**1,278,983**	**21**

Source: RLCMS - (https://www.landcovermapping.org/en/landcover/#)

5.4.2 Alternative Routing of Selected Alternative

Two alternatives on the selected transmission line are provided in the EIA for the 500 kV transmission line (Innogreen, 2020). The option considered included:

- **Option 1**: The transmission line route has a length of 21 km and is comprised of a total of 47 towers. The topographic characteristics consist of few high mountainous area and many plateau areas with favorable conditions for construction and maintenance, as route will extend along the side of the mountain and will facilitate the building of a shorter access road to the towers. This will reduce the overall area impacted by construction of access roads.

  The transmission line route will pass through 5 km of protection forest and few area of production land of the people. There is no relocation of house and construction structure from the transmission line route. Only the cemetery area of Ban Dak Bong is located in ROW that the project agrees to perform the ceremony in accordance with the custom and tradition of the village.

- **Option 2**: The transmission line route has a length of 20 km and is comprised of a total of 42 towers. The topographic characteristics of the transmission line route are similar to Option 1, however, near the Vietnam / Lao border, the transmission line will extend to the left side of the road, which is difficult to access and requires a longer access road.

  The transmission line route will also pass through 5 km of protection forest but will pass through the production area of the people more than in option 1. Access roads shall be built to the tower foundations which pass through a large production area (coffee plantation) in Ban Ngondon.This route will also cause resettlement impact due to relocation of 2 households in Ban Dak Bong from the transmission line route.

The two options are shown in ***Figure 5-3***.

Although Option 1 is longer and requires more towers; the topographic conditions along the transmission line route of Option 1 are more convenient and will incur smaller access roads. Option 1 was therefore considered for the Project (as shown in ***Figure 5-3***).

Efforts were focused on planning transmission lines alignments outside of Protected Areas (e.g. Dong Hua Sao PA to the west) and where possible minimizing the impact to KBAs (Key Biodiversity Areas), although protected areas avoidance was a first priority. The original TL planned to the Ban Lak 25 substation for example, was amended to connect to Thanh My substation in Vietnam, reducing the overall length of the line considerably, thereby reducing overall extent of natural forest clearing and avoiding impacts to two KBAs. Due to the number of KBAs and their spatial orentiation and extent in the region, complete avoidance was often not possible (for example the 500 kV TL route to Vietnam in the east, where the geographical extent and orientation of the Song-Thanh KBA did not allow for complete avoidance), although efforts were implemented to reduce the length of crossings of some KBAs (e.g. Bolaven North-east) and Phou Kathong, shown on the map in Figure 4.2). Also, the TL followed the existing road alignments in various areas which also serves to minimize further impact by locating infrastructure within already disturbed habitats/areas. Complete avoidance of Dakchung Plateau KBA could not be realized fully for technical reasons pertaining to the feasibility of the project and positioning of WTGs where maximum power generation potential can be achieved to make the project viable. However the TL length is restricted in this area and the number of WTGs is also limited in comparison to other clusters of WTGs in the project area. Furthermore, as biodiversity enhancement through an offset intervention has been recommended for portions of Dakchung Plateau KBA to restore degraded forest habitat, in an effort to achieve at least a no net loss of biodiversity for the project, and this should sufficiently compensate for impacts of the project on the KBA habitats. Tthis is discussed in ***Section 8.4.3.7 'Residual Impacts to Biodiversity***' with further detail on the preliminary offset strategy contained in the initial **BAP: Biodiversity Action Plan**.

Figure 5-4 shows the transmission line in relations to the NTFP collection area.

Figure 5-3: Alternative Transmission Line Routing to Sub-Stations

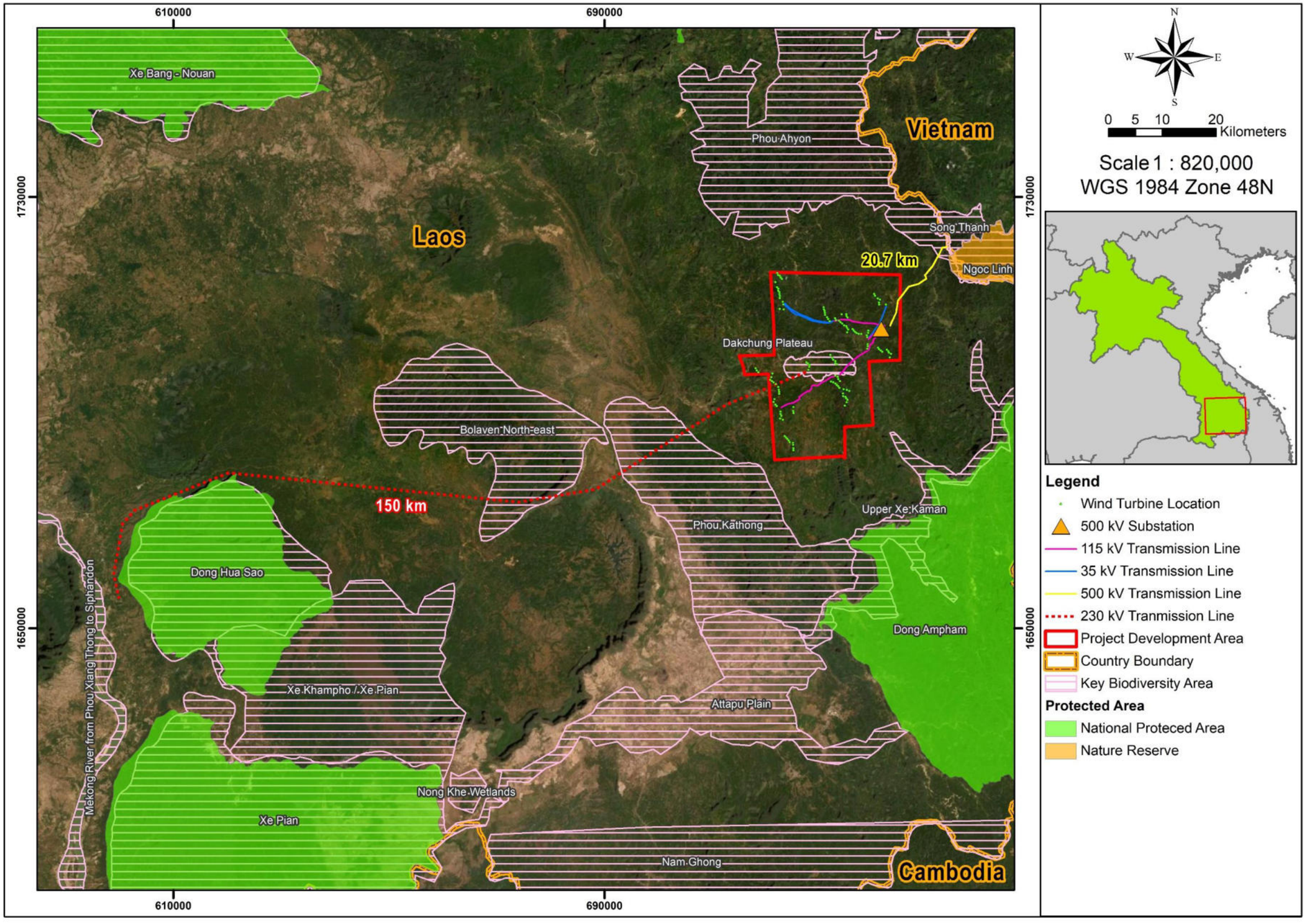
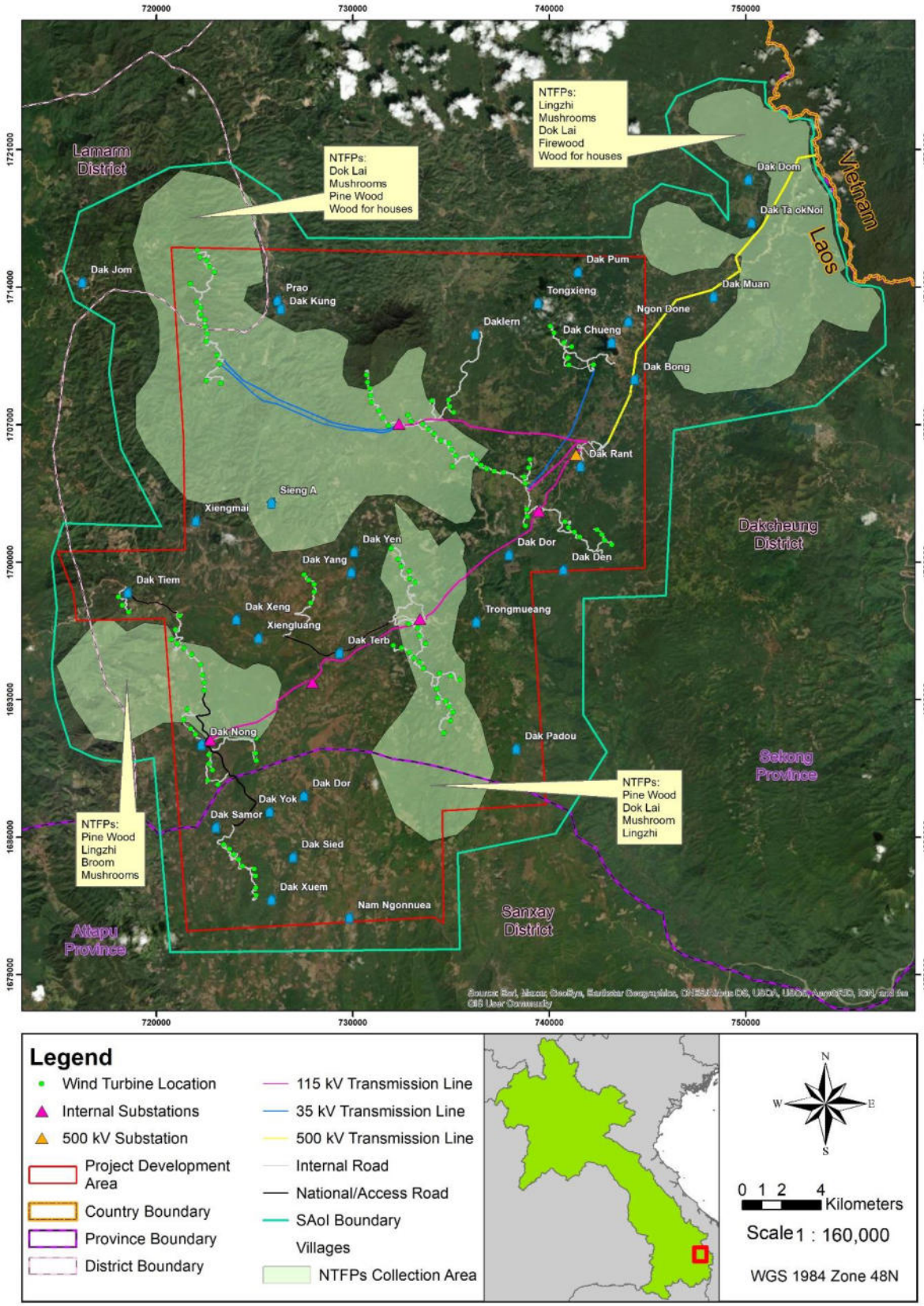


Figure 5-4: NTFP Collection Area



5.5 Alternatives on Technology

Within the wind farm industry, the following technology alternatives can be considered:

- Horizontal Axis Wind Turbine (HAWT); and
- Vertical Axis Wind Turbine (VAWT).

A comparison of the wind turbine technologies in terms of axis of direction, efficiency, location, design complexity, safety, and noise generation of VAWT and HAWT are described in ***Table 5-3***.

In conclusion, horizontal axis wind turbines (HAWTs) dominate the majority of the wind industry. In large scale grid connected applications (such as for the Project), horizontal axis wind turbine concept is the preferred choice. The horizontal wind turbines are able to produce more electricity from a given amount of wind using lesser foot print.

The Project has selected to use the 3-blade horizontal wind turbine as this type is most widely used at present time as it has the highest energy conversion efficiency. This is the most common, mature and commercially proven wind turbine technology deployed in all large-scale wind farms across the world.

Table 5-3: Comparison of HAWT and VAWT Wind Turbine Alternatives

Topic	Horizontal Axis Wind Turbine (HAWT)	Vertical Axis Wind Turbine (VAWT)
Wind direction	HAWT needs the wind to flow at a perpendicular angle to the blades. To accommodate changes in wind direction, turbines are usually equipped with a yaw drive that rotates the unit's direction. However, the drive adapts slowly to changing directions because it must turn the entire turbine and propeller assembly.	VAWT runs in all possible wind directions, making it better-suited to urban areas with tall buildings. Additionally, the VAWT design allows it to operate on lower wind speeds than is possible with the horizontal turbine.
Efficiency	Overall, HAWT have a higher energy output than VAWT because their blades are positioned perpendicularly to wind direction. The larger blades with massive spans allow for a higher surface area that can capture wind and the three-blade standard allows air to spin through as the wind carries blade currents downwind before the next blade passes through. Under the same general wind conditions, two-bladed turbines are less efficient than three-bladed.	VAWT systems capture energy from the wind only on the front side; while winds can drag the system at the rear part of their rotation. The result is comparably reduced efficiency in power generation of VAWT in general compared to HAWT. Therefore, VAWT wind farm of a commercial scale would require more materials and space to generate a comparable amount of power compared to a farm equipped with horizontal-axis turbines leading to higher Cost of Electricity.
Location	HAWT's tall tower and long blades work extremely well in wide-open spaces.	VAWTs are generally better suited in compact locations, chiefly urban areas and rooftops
Design complexity	VAWTs are generally more complex to operate and maintain than HAWTs,	Due to HWT complexity; large commercial operations favor the HAWT technology more often than not.
Safety:	HAWT rarely collapse due to lateral stress.	VAWT asymmetrical front and rear design can create stress on their bearings.
Noise Generation:	The larger a HAWT gets, the quieter it becomes in proportion to its energy output (a 4.5MW wind turbine is only a dB or two noisier than a 1.5MW wind turbine).	Limited research is available on the noise generation of large scale VAWT wind farms.
Land Requirement	HAWT require a large area of land for their operation	VAWTs do not require a large area of land, and can be installed near each other, in between HAWTs and in urban areas[22]

[22] https://www.adb.org/sites/default/files/publication/696291/adbi-wp1250.pdf

5.6 Alternatives on Site Selection

The wind direction and speed are taken into account as key factors in considering wind energy potential in the area. The Wind Energy Resource Atlas of Southeast Asia conducted by the World Bank (World Bank, 2001), outlines the wind energy potential in the project location areas and the study areas (located in Dak Cheung District of Sekong province and Sanxay District of Attapeu Province).

Based on the assessment report that IEAD requested an international wind expert to identify potential areas for wind farm with a capacity between approximately 100 and 600MW, Dak Cheung District, Sekong Province is one of the potential areas for large scale wind farm development.

The assessment report considered the following constraints;

- Proximity to transmission line
- Proximity to population centres
- Potential site access based on proximity to existing road
- Land use and vegetation coverage
- Site capacity as indicated by area of land available
- Proximity to aircraft facilities
- Expected high wind resource
- Terrain complexity

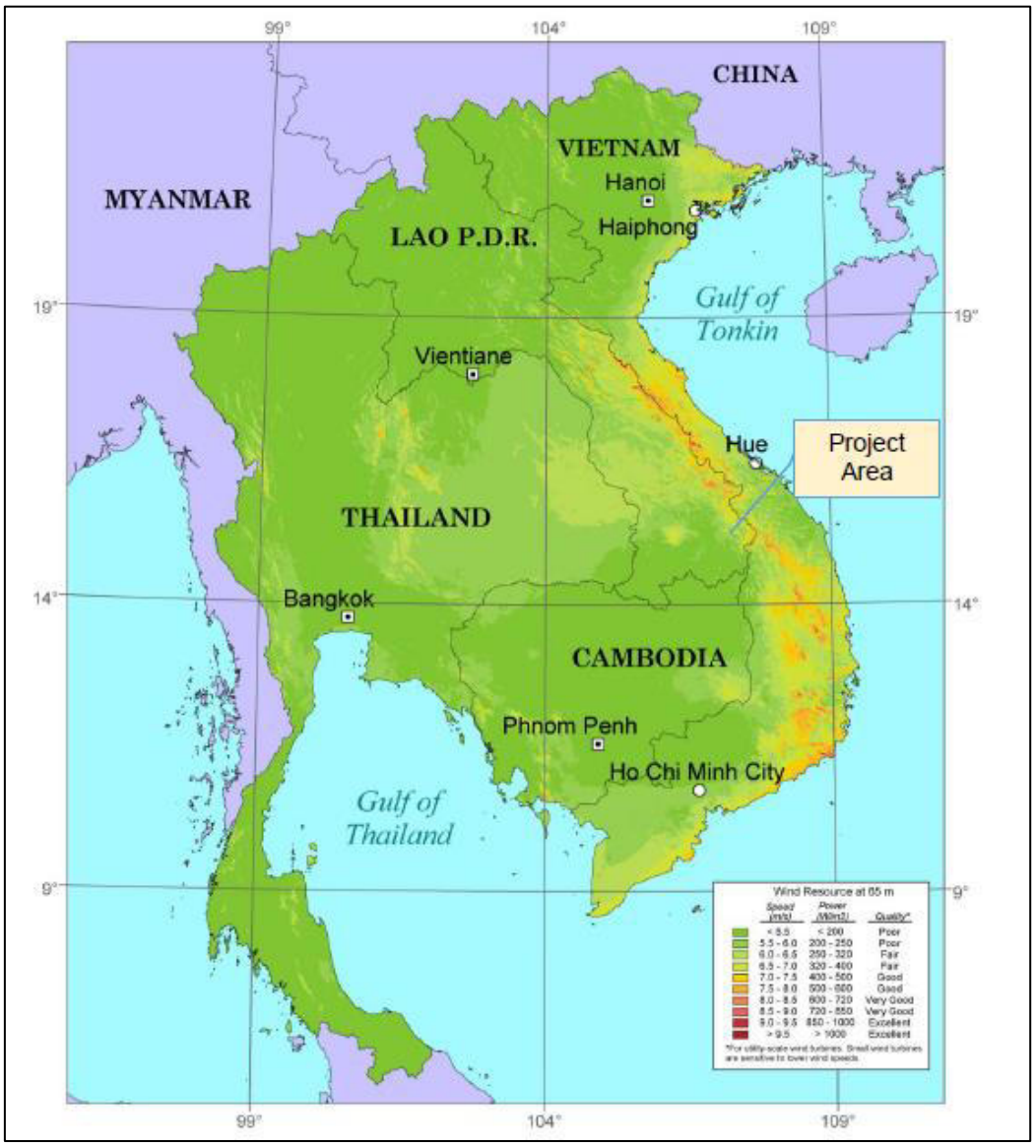
Dak Cheung District is also the high wind resource as result of wind mast installation for a year in 2013.

These areas have an altitude of 65 meters is about 7.5 m/s on average and it is concluded that they have good and sufficient potential for producing electricity from wind energy as is shown in *Error! Reference source not found.*. Although the East of the project alternative location has higher speed of wind (above 7.5 m/s), those area is also in the key biodiversity area or protected area. No other information on selected sites within Laos has been provided.

In addition, the project has conducted a study of wind energy potential by installing the wind measuring mast at 5 stations within the project site from July 2012 - present time. These wind measuring masts have a height of 140 meters and the record of data is made by using the equipment, such as SecondWind Nomad^2, WindSensor P2546A and Vector w200P. The result of long term average wind speed at 110 m hub height is 6.47 m/s.

The site was selected prior to commencing the ESIA and as such, the alternatives assessment of the ESIA focuses on re-routing of facilities within the designated area.

Figure 5-5: Annual Average Wind Energy Potential Countrywide with an Altitude of 65 meters



Source: World Bank, 2001

5.7 Alternative Methods of Power Generation

This section describes several alternatives including renewable energy alternatives as well as other alternatives for power generation according to Lao's Power Development plan such as conventional thermal power plants.

A summary of the advantages and disadvantages of each power generation methods are shown in ***Table 5-4***. Compared to most other traditional power generation methods, the wind power projects have a limited reversible impact on the environment and contribute to reducing the production and use of energy from fossil fuels, which causes the increase of greenhouse gas level and impacts on climate change. As such, wind energy is considered one of the most suitable alternatives of power generation.

Table 5-4: Comparisons between Power Generation Methods

System	Advantage	Disadvantage
Supercritical Thermal Power	■ Large-scale production potential ■ Moderate gestation period Wider distribution potential ■ Provides cheap electricity to the consumer ■ Provide stable output and reliable electricity on the grid ■ Easily accessible and well established technology ■ Requires less land per Megawatt	■ High fossil fuel consumption ■ Large quantities of water required for cooling ■ High volume of emission from operation ■ Accumulation of fly ash (in case of coal powered installations) ■ Upstream impact from mining and oil exploration
Ultra Supercritical Thermal Power	■ In addition to the above advantages: ■ Improved efficiency by reaching higher pressure and temperatures compared to supercritical boilers. ■ Reduced emissions, particularly of CO and mercury. ■ The general rule of thumb is that each percentage point of efficiency improvement yields 2–3% less CO. ■ Potentially lower operating costs	■ As above.
Biomass	■ Abundant resource: from forests and croplands to waste and landfills ■ Biomass helps reduce waste ■ Biomass is a reliable source of power generation as biomass energy plants are dispatch-able, meaning they can easily be turned on or off	■ Additional costs associating extracting, transporting and storing of biomass prior to power production process ■ Space requirements ■ Can lead to deforestation and/or it may compete directly with food production (e.g. corn, soy) ■ Release pollutants into the air, such as carbon dioxide, nitrogen oxides, volatile organic compounds, and more.
Hydropower	■ GHG emission estimated as low ■ Do not create any waste by-products during conversion process ■ Some hydropower facilities can quickly go from zero power to maximum output because hydropower plants can generate power to the grid immediately. They provide essential back-up power during major electricity outages or disruptions.	■ Site specific, dependent on reservoir/ river/ ■ Long gestation period ■ Alteration of river flow regime ■ Adverse social and ecological impacts due to inundation and downstream effects
Solar power	■ Polluting levels are low ■ Inexpensive power generation	■ Large land requirement ■ Site-specific, dependent on solar insolation

System	Advantage	Disadvantage
	■ Inexhaustible solar resource ■ GHG emissions estimated as low	■ Expensive installation ■ Electronic and hazardous waste after expired that require proper management
Wind power	■ Pollution levels are low ■ Inexpensive power generation ■ Inexhaustible wind resources ■ GHG emissions estimated as low	■ Large land requirement ■ Site-specific, dependent on wind pattern ■ Expensive installation ■ Visual impacts and harm to bird species

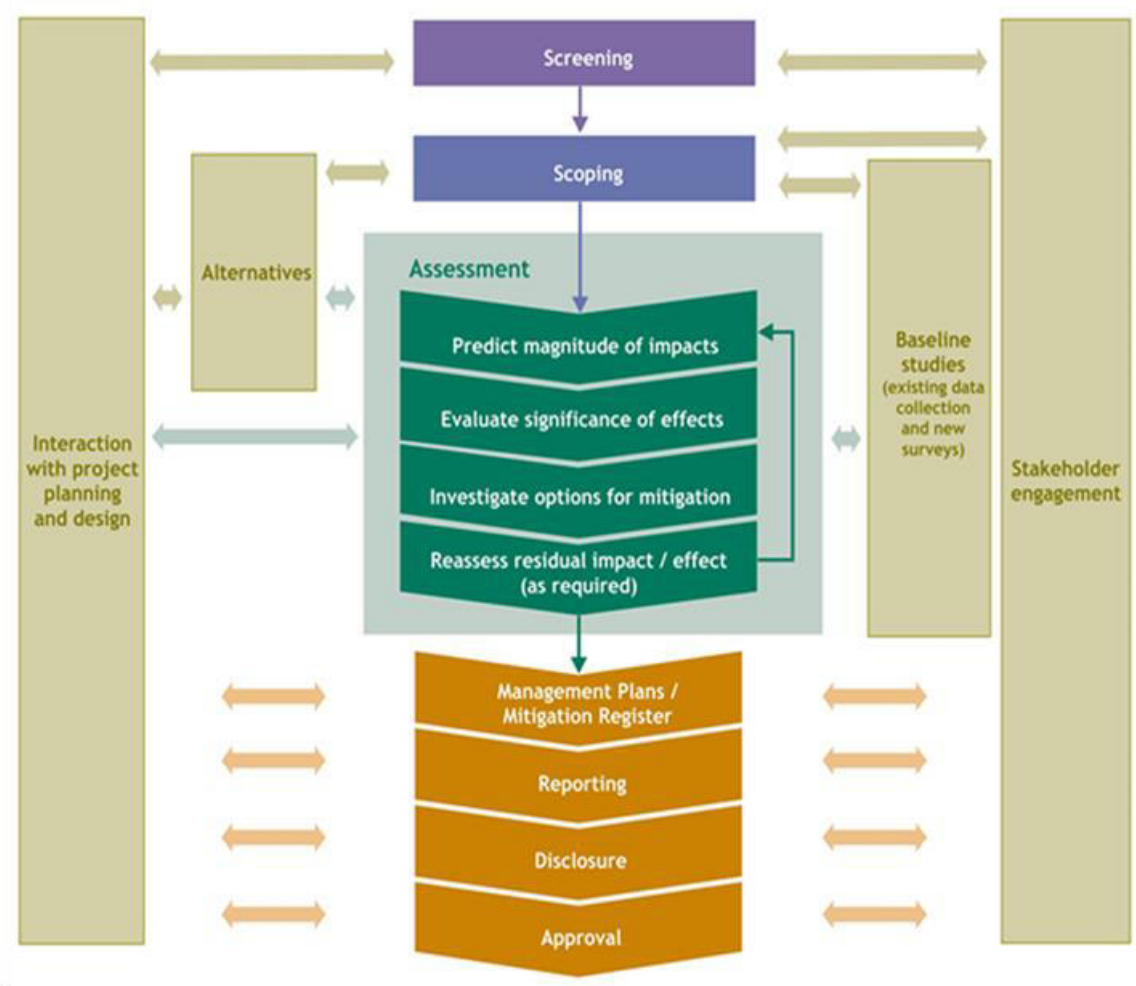
6 IMPACT ASSESSMENT METHODOLOGY

6.1 Introduction

This section presents the methodology used to conduct the Environmental and Social Impact Assessment (ESIA) for the Project. The Impact Assessment (IA) is undertaken following a systematic process that predicts and evaluates the impacts the Project could have on aspects of the physical, biological, social/ socio- economic and cultural environment, and identifies measures that the Project is planning to avoid, reduce, mitigate, offset or compensate for adverse impacts; and to enhance positive impacts where practicable.

The methodology has followed the approach illustrated in ***Figure 6-1***.

Figure 6-1: Overall Impact Assessment Approach



Source: ERM, 2019

This section also details the methodology used for the collection and analysis of primary and secondary data used in this report. Primary and secondary information from the Project Owner, government sources, non-governmental organisations (NGOs) and other Project-related stakeholders have been collected to support the preparation of this report.

6.2 Screening

The screening was conducted utilizing a high-level description of the Project and its associated facilities, including available information regarding the project design and existing environmental and

social conditions, applicable regulatory framework for the Project etc. in order to provide a summary of initial findings on potential project impacts and to guide development of the ESIA.

6.3 Scoping

Scoping has been undertaken to delineate the potential Area of Influence for the Project (and therefore the appropriate Study Area) and to identify potential interactions between the Project and resources/ receptors in the Area of Influence. It also helps in developing and selecting alternatives to proposed action and in identifying the issues to be considered in this ESIA. A scoping exercise was completed as part of the gap analysis undertaken by ERM.

6.4 Project Boundary and Area of Influence

In order to set out the scope of the Project features and activities, with particular reference to the aspects, which have the potential to impact the environment, a Project Description has been prepared. Details of the Project facilities' design characteristics, as well as planned and possible unplanned Project activities, are provided in ***Section 4*** of this ESIA Report. The Project Area of Influence (AoI) is also defined in ***Section 8*** of this ESIA Report.

6.5 Baseline Data Collection

To provide the context within which the impacts of the Project can be assessed, a description of physical, biological, social/socio-economic and cultural conditions that would be expected to prevail in the absence of the Project is presented. The baseline includes information on all resources/receptors that were identified during scoping as having the potential to be significantly affected by the Project.

The existing and additional environmental and social baseline conditions of the Project are reported in ***Section 8*** of this ESIA Report.

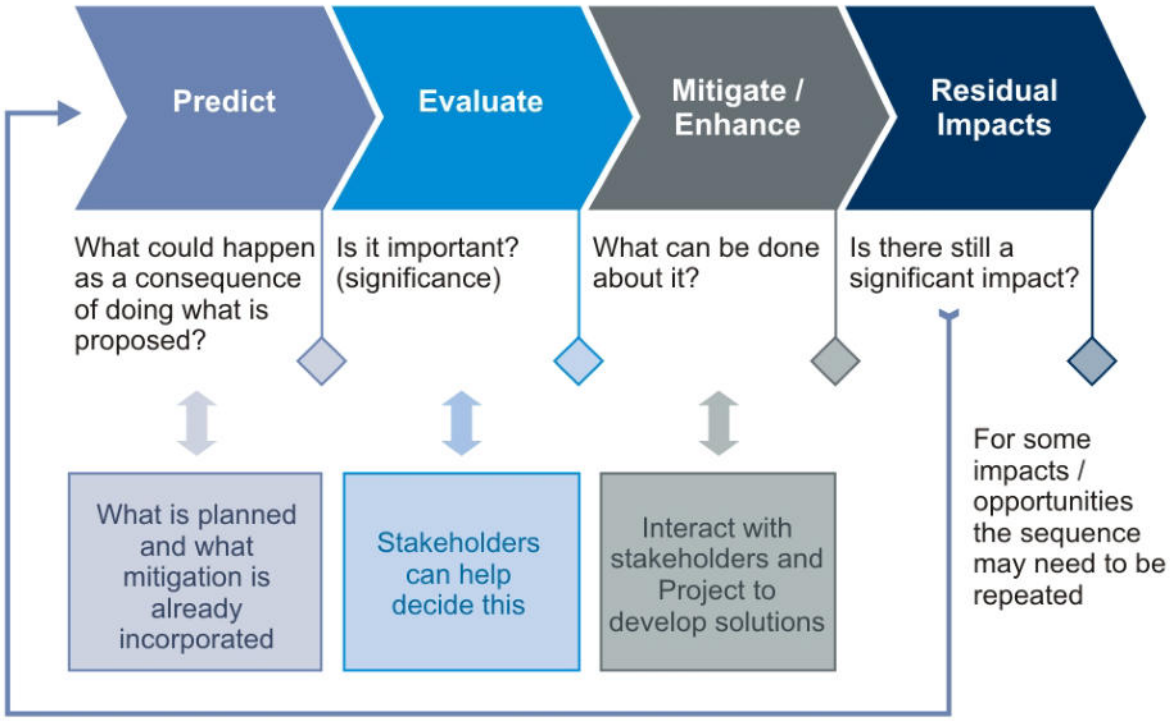
The baseline takes into account current conditions, as well as those changing conditions apparent in the Baseline and takes into consideration other developments within the Project area, which are underway or certain to be initiated in the near future. These developments are considered in the assessment of cumulative impacts and effects.

6.6 Impact Assessment Process

Impact identification and assessment starts with scoping and continues through the remainder of the ESIA Process. The principal ESIA steps are summarised in ***Figure 6-2*** and comprise:

- **Potential Impact Prediction**: to determine what could potentially happen to resources/receptors as a consequence of the Project and its associated activities;
- **Impact Evaluation**: to evaluate the significance of the predicted impacts by considering their magnitude and likelihood of occurrence, and the sensitivity, value and/or importance of the affected resource/receptor;
- **Mitigation and Enhancement Measures**: to identify appropriate and justified measures to mitigate potential negative impacts and enhance potential positive impacts; and
- **Residual Impact Evaluation**: to evaluate the significance of potential impacts assuming effective implementation of mitigation and enhancement measures.

Figure 6-2: Overall Impact Assessment Process



Source: ERM, 2019

6.6.1 Impact Prediction

Prediction of impacts is essentially an objective exercise to determine what is likely to happen to the environment as a consequence of the Project and its associated activities. From the potentially significant interactions identified in Scoping, the impacts to the various resources/receptors are elaborated and evaluated. The diverse range of potential impacts considered in the ESIA process typically results in a wide range of prediction methods being used, including quantitative, semi-quantitative and qualitative techniques.

6.6.2 Impact Evaluation

Once the prediction of potential impacts is complete, each potential impact is described in terms of its various relevant characteristics (e.g., type, scale, duration, frequency, extent). The terminology and designations used to describe impact characteristics are shown in ***Table 6-1***.

Table 6-1: Impact Characteristics Terminology

Characteristic	Definition	Designations
Type	A descriptor indicating the relationship of the potential impact to the Project (in terms of cause and effect).	Direct Indirect Induced
Extent	The “reach” of the potential impact (e.g., confined to a small area around the Project Footprint, projected for several kilometres, etc.).	Local Regional International
Duration	The time period over which a resource / receptor is potentially affected.	Temporary Short term Long term

Characteristic	Definition	Designations
Scale	The size of the potential impact (e.g., the size of the area with the potential to be damaged or impacted, the fraction of a resource that could potentially be lost or affected, etc.).	[no fixed designations; intended to be a numerical value or a qualitative description of "intensity"]
Frequency	A measure of the constancy or periodicity of the potential impact.	[no fixed designations; intended to be a numerical value or a qualitative description]

The definitions for the *type* designations are shown in ***Table 6-2***. Definitions for the other designations are resource/receptor-specific, and are discussed in the resource/receptor-specific impact assessment chapters presented later in this Report.

Table 6-2: Impact Type Definitions

Type	Definition
Direct	Potential impacts that result from a direct interaction between the Project and a resource/receptor (e.g., between occupation of a plot of land and the habitats which are affected).
Indirect	Potential impacts that follow on from the direct interactions between the Project and its environment as a result of subsequent interactions within the environment (e.g., viability of a species population resulting from loss of part of a habitat as a result of the Project occupying a plot of land).
Induced	Potential impacts that result from other activities (which are not part of the Project) that happen as a consequence of the Project (e.g., influx of workers resulting from the importation of a large Project workforce).

The above characteristics and definitions apply to planned and unplanned events. An additional characteristic that pertains only to unplanned events is *likelihood*. The *likelihood* of an unplanned event occurring is designated using a qualitative scale, as described in ***Table 6-3***.

Table 6-3: Definitions for Likelihood Designations

Likelihood	Definitions
Unlikely	The event is unlikely but may occur at some time during normal operating conditions
Possible	The event is likely to occur at some time during normal operating conditions
likely	The event will occur during normal operating conditions (i.e., it is essentially inevitable)

Once impact characteristics are defined, the next step in the impact assessment phase is to assign each potential impact a 'magnitude'. Magnitude is typically a function of some combination (depending on the resource/receptor in question) of the following impact characteristics:

- Extent;
- Duration;
- Scale;
- Frequency; and
- Likelihood (for unplanned event).

Magnitude essentially describes the intensity of the change that is predicted to occur in the resource/receptor as a result of the potential impact. The magnitude designations themselves are universally consistent, but the definitions for these designations vary depending on the resource/receptor. The universal magnitude designations are:

- Positive;
- Negligible;

- Small;
- Medium; and
- Large.

In the case of a potential positive impact, no magnitude designation (aside from 'positive') is assigned. It is considered sufficient for the purpose of the ESIA to indicate that the Project is expected to result in a potential positive impact, without characterising the exact degree of positive change likely to occur.

In the case of potential impacts resulting from unplanned events, the same resource/receptor-specific approach to concluding a magnitude designation is utilised. However, the 'likelihood' factor is considered, together with the other impact characteristics, when assigning a magnitude designation.

In addition to characterising the magnitude of impact, the other principal impact evaluation step is definition of the sensitivity/vulnerability/importance of the impacted resource/receptor. There are a range of factors to be taken into account when defining the sensitivity/vulnerability/importance of the resource/receptor, which may be physical, biological, cultural or human. Other factors may also be considered, such as legal protection, government policy, stakeholder views and economic value. As in the case of magnitude, the sensitivity/vulnerability/importance designations themselves are universally consistent, but the definitions for these designations vary on a resource/receptor basis.

The sensitivity/vulnerability/importance designations used herein for all resources/ receptors are:

- Low;
- Medium; and
- High.

Once magnitude of impact and sensitivity/vulnerability/importance of resource/receptor have been characterised, the significance can be assigned for each impact. Impact significance is designated using the matrix shown in ***Table 6-4***.

Table 6-4: Impact Significance

		Sensitivity/Vulnerability/Importance of Resource/Receptor		
		Low	**Medium**	**High**
Magnitude of Impact	**Negligible**	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

The matrix applies universally to all resources/receptors, and all impacts to these resources/receptors, as the resource/receptor-specific considerations are factored into the assignment of magnitude and sensitivity/vulnerability/importance designations that enter into the matrix. ***Box 6.1*** provides a context for what the various impact significance ratings signify.

It is important to note that impact prediction and evaluation take into account any embedded controls (i.e., physical or procedural controls that are already planned as part of the Project design, regardless of the results of the ESIA Process). This avoids the situation where an impact is assigned a magnitude based on a hypothetical version of the Project that considers none of the embedded controls.

Box 6.1: Context of Impact Significances

An impact of **negligible** significance is one where a resource/receptor (including people) will essentially not be affected in any way by a particular activity or the predicted effect is deemed to be 'imperceptible' or is indistinguishable from natural background variations.

An impact of **minor** significance is one where a resource/receptor will experience a noticeable effect, but the impact magnitude is sufficiently small and/or the resource/receptor is of low sensitivity/vulnerability/importance. In either case, the magnitude should be well within applicable standards.

An impact of **moderate** significance has an impact magnitude that is within applicable standards, but falls somewhere in the range from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. Clearly, to design an activity so that its' effects only just avoid breaking a law and/or cause a major impact is not best practice. The emphasis for moderate impacts is therefore on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that impacts of moderate significance have to be reduced to minor, but that moderate impacts are being managed effectively and efficiently.

An impact of **major** significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. An aim of ESIA is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long-term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a facility. It is then the function of regulators and stakeholder to weigh such negative factors against the positive ones, such as employment, in coming to a decision on the Project.

6.6.3 Identification of Mitigation and Enhancement Measures

Once the significance of a potential impact has been characterised, the next step is to evaluate what mitigation and enhancement measures are warranted. For the purposes of this ESIA, ERM has adopted the following Mitigation Hierarchy:

- **Avoid at Source, Reduce at Source**: avoiding or reducing at source through the design of the Project (e.g., avoiding by siting or re-routing activity away from sensitive areas or reducing by restricting the working area or changing the time of the activity);
- **Abate on Site**: add something to the design to abate the impact (e.g., pollution control equipment, traffic controls, perimeter screening and landscaping);
- **Abate at Receptor**: if an impact cannot be abated on-site then control measures can be implemented off-site (e.g., noise barriers to reduce noise impact at a nearby residence or fencing to prevent animals straying onto the site);
- **Repair or Remedy**: some impacts involve unavoidable damage to a resource (e.g. agricultural land and forestry due to creating access, or materials storage areas) and these impacts can be addressed through repair, restoration or reinstatement measures; and
- **Compensate in Kind, Compensate Through Other Means**: where other mitigation approaches are not possible or fully effective, then compensation for loss, damage and disturbance might be appropriate (e.g., planting to replace damaged vegetation, financial compensation for damaged crops or providing community facilities for loss of fisheries access, recreation and amenity space).

The priority in mitigation is to first apply mitigation measures to the source of the potential impact (i.e., to avoid or reduce the magnitude of the potential impact from the associated Project activity), and then to address the resultant effect to the resource/receptor via abatement or compensatory

measures or offsets (i.e., to reduce the significance of the effect once all reasonably practicable mitigations have been applied to reduce the impact magnitude).

6.6.4 Residual Impact Evaluation

Once mitigation and enhancement measures are declared, the next step in the ESIA Process is to assign residual impact significance. This is essentially a repeat of the impact assessment steps discussed above, considering the implementation of the proposed mitigation and enhancement measures.

6.6.5 Cumulative Impact Assessment Process

According to IFC 2013, “Cumulative impacts (CI) are those that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones”. According to the IFC (IFC 2013), the assessment and management of cumulative impacts is necessary when the Project and other developments under consideration could contribute to generating cumulative impacts on valued environmental and social component.

In order to gain an understanding of the projects overall contribution to impacts, a cumulative impact assessment (CIA) was undertaken. Whilst total cumulative impacts due to multiple projects within a given area should be identified within government-led spatial planning efforts, the Project owner needs to determine the degree to which it is contributing to these overall cumulative impacts. In this regard, the objectives of the CIA are twofold:

- Determine if the cumulative impacts caused by the Project and other existing or predictable future projects would threaten the sustainability of valuable environmental component (VEC) in the area; and
- Develop mitigation measures to prevent unacceptable conditions of VECs. The measures could include additional mitigation measures for Project and additional mitigation measures for other existing or predictable future projects in the area.

The ESIA and CIA are prepared based on similar logical framework, analytical process and tools. Unlike the ESIA that centers on the Project as a source of impacts, the CIA focuses on VECs under influence from different projects (***Figure 6-3***). In a CIA, the overall resulting condition of the VEC and its related viability are assessed.

This CIA closely follows the six (6) steps of the IFC Guidance (IFC 2013), as shown in ***Figure 6-4***.

IFC Guidance takes into consideration the limitations that a private developer may face carrying out a CIA as part of an ESIA, or difficulties encountered in compiling such information. The limitations applicable to this CIA include:

Incomplete information about other projects and activities (e.g. the information is not available in the public domain);

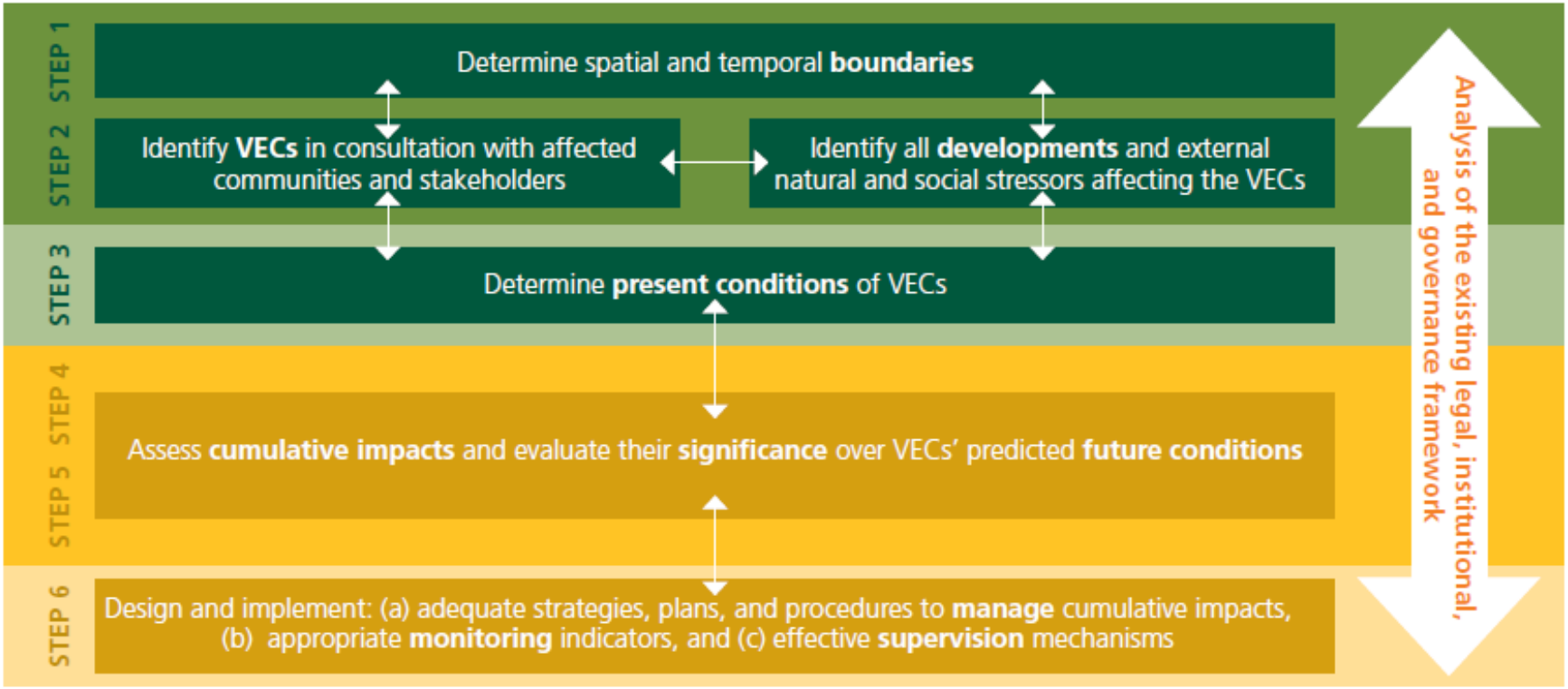
Uncertainty with respect to the implementation of future projects; and

Difficulty in establishing thresholds or limits of acceptable change for VECs, and therefore the significance of cumulative impacts.

Figure 6-3: Comparing an ESIA and a CIA

Source: IFC, 2013

Figure 6-4: Conceptual CIA Process



Source: IFC, 2013.

6.6.6 Management, Monitoring, and Audit

The final stage in the IA Process is the definition of the basic management and monitoring measures that are needed to identify whether: a) impacts or their associated Project components remain in conformance with applicable standards/ guidelines; and b) mitigation measures are effectively addressing impacts and compensatory measures and offsets are reducing effects to the extent predicted.

6.7 Risk Assessment for Unplanned Events

To evaluate potential impacts from unplanned events, a risk-based approach is used to define: 1) the most likely unplanned events leading to environmental, social and/or community health impacts; and 2) those unplanned events with the most significant potential environmental, social and/or community health impacts overall. Impact significance for unplanned events is therefore determined by evaluating the combination of likelihood and consequence.

6.7.1 Assess the Scale of Consequence

Indicative levels of consequence for potential impacts from unplanned events can be defined for the physical, biological, and social environment as provided in ***Table 6-5***.

Table 6-5: Indicative Levels of Consequence for Potential Impacts from Unplanned Events

	Incidental	Minor	Moderate	Major	Severe
Physical Environment	Impacts such as localised or short term effects or environmental media, meeting all environmental standards	Impacts such as widespread, short-term impacts to environmental media, meeting all environmental standards	Impacts such as widespread, long-term effects on environmental media, meeting all environmental standards	Impacts such as significant, widespread and persistent changes in environmental media OR Exceedance of environmental standards	Exceedance of environmental standards and fine/ prosecution
Biological Environment	Impacts such as localised or short term effects on habitat or species	Impacts such as localised, long term degradation of sensitive habitat or widespread, short-term impacts to habitat or species	Impacts such as localised but irreversible habitat loss or widespread, long-term effects on habitat or species	Impacts such as significant, widespread and persistent changes in habitat or species	Impacts such as persistent reduction in ecosystem function on a landscape scale or significant disruption of a sensitive species.
Social Environment	Slight, temporary, adverse impact on a few individuals	Temporary (<1 year), adverse impacts on community which are within international health standards	Adverse specific impacts on multiple individuals that can be restored in <1 year OR One or more injuries, not lost-work injuries.	Adverse long-term, multiple impacts at a community level, but restoration possible. OR One or more lost-work injuries to a member of the public including permanently disabling injuries.	Adverse long-term, varied and diverse impacts at a community level or higher – restoration unlikely. OR Fatalities of public.

6.7.2 Assess the Likelihood

For the purposes of assessment, the likelihood of an unplanned event occurring can be classified as follows:

1 - Remote, not known in the industry;

2 - Very unlikely, known of in the industry;

3 - Unlikely, may occur once or more in life of the Project;

4 - Likely, may occur once or twice per year;

5 - Expected, may occur more than twice per year.

6.7.3 Assess the Significance

The consequences and likelihood of potential unplanned events are combined to determine the overall impact significance using the risk matrix shown in ***Table 6-6***.

For potential impacts that are determined to have an impact significance of Moderate or Major, risk reduction measures are identified; these can include measures that reduce the likelihood of the event from occurring (i.e., preventive barriers), those that reduce the consequences on sensitive receptors/resources if the event were to occur (i.e. mitigation or recovery measures), and those that affect the likelihood and consequence.

Table 6-6: Risk Matrix for Potential Unplanned Events

		Likelihood of Occurrence				
		Incidental	**Minor**	**Moderate**	**Major**	**Severe**
Consequence	**Incidental**	Negligible	Negligible	Negligible	Negligible	Negligible
	Minor	Negligible	Minor	Minor	Minor	Moderate
	Moderate	Minor	Minor	Moderate	Moderate	Major
	Major	Moderate	Moderate	Major	Major	Major
	Severe	Major	Major	Major	Major	Major

7 STAKEHOLDER ENGAGEMENT

The section provides the stakeholder engagement and public consultation activities conducted during the EIA and Supplemental ESIA process until December 2021. It is also noted that these activities will be mentioned in a Stakeholder Engagement Plan (SEP).

7.1 Stakeholder Identification and Mapping

7.1.1 Stakeholder Identification

ADB defines stakeholders as *"individuals or groups or institutions who can or are likely to (i) influence (promote, support, disrupt, or stop) the course of a program or project; and/or (ii) be affected (favourably or adversely) by the program or project*"[23]

IFC defines stakeholders as *"persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Stakeholders may include locally affected communities or individuals and their formal and informal representatives, national or local government authorities, politicians, religious leaders, civil society organizations and groups with special interests, the academic community, or other businesses*."[24]

Based on ADB's and IFC's definition of stakeholders described above, the Project defines stakeholders to include workers, local communities affected by the project, national and local authorities, neighbouring projects, and/or nongovernmental organizations.

Stakeholder identification for the Project was initiated during preparation of the EIA in 2014 and was further developed and refined during the supplementary ESIA process. The results of the preliminary stakeholder identification process are presented in ***Table 7-1*** and the stakeholder mapping results are presented in ***Figure 7-1***.

The stakeholder list as well as stakeholder analysis and mapping will continue to be revised according to the ongoing receipt of comments and input from stakeholders directed to the Project. This will be provided in the SEP.

[23] ADB (2019). Guidance Note on Stakeholder Communication Strategies for Projects in South Asia. https://www.adb.org/sites/default/files/institutional-document/512211/stakeholder-communication-strategies-guidance-note.pdf

[24] IFC (2007) Stakeholder Engagement A Good Practice Handbook for Companies Doing Business in Emerging Markets. https://www.ifc.org/wps/wcm/connect/affbc005-2569-4e58-9962-280c483baa12/IFC_StakeholderEngagement.pdf?MOD=AJPERES&CVID=jkD13-p

Table 7-1: Preliminary Identification of Project Stakeholders

Stakeholder Group	Interest and Role in the Project	Description and Relevant Stakeholders
Project Affected Persons (PAPs)		
Affected Population	Individuals, households and businesses that may be impacted by construction and operation of the Project. The impacts may include: ■ Economic displacement (loss of agriculture land) due to Project land acquisition; ■ Noise and dust from construction activities; ■ Noise and shadow flicker impacts from the wind turbines; ■ Community safety; ■ Loss of forest and NTFP collection resources; ■ Restricted access to natural resources and agricultural land; ■ Increased traffic risks and congestion; and ■ Increased demand on local infrastructure and public services due to influx of Project construction labours. Stakeholders may include, but are not limited to: ■ Individuals and households (including non-title holders) that will be affected by the land acquisition process for the Project ■ The villages, households, and individuals affected by Project construction and operation including safety buffer and shadow flicker, noise, visual, stormwater, etc ■ People who make their livelihoods on land which will be affected by land acquisition of the Project; ■ Individuals and households that will have restricted access to natural resources due to the Project footprint. These stakeholders may include, for example, villagers who collect herbs, food, and firewood for livelihood; ■ People affected by the construction and operation of the ancillary facilities and workers' camps; ■ People affected by the construction and operation of the transmission line;	These include households in 24 villages in Dak Cheung District, Sekong Province and 8 villages in Sanxay District, Attapeu province. Individuals and households of nearby villages who may be make livelihood on affected lands and/or have restricted access to natural resources due to the Project footprint Individuals and households who are located within and/or nearby to the PSAoI. These include: ■ Residents of Dak Cheung District, Sekong Province ■ Residents of Sanxay District, Attapeu Province Vulnerable groups in the affected villages

Stakeholder Group	Interest and Role in the Project	Description and Relevant Stakeholders
	■ People affected by the construction and operation of the access road and internal roads; ■ Those areas located within the Project's footprint or area of disturbance such as air or noise emission and shadow flicker.	
Cumulative Impacted Population	■ Individuals or groups located within the PSAoI, who many not be included in the affected population discussed above, however they may experience, for example, increased noise emissions, increased costs of living, and/or decreased forest resources due to the cumulative impact of neighbouring wind farm projects.	Individuals and organisations located within the Cumulative Area of Influence which has been defined in ***Section 9.1.1*** as follows: ■ Several villages (24 villages in Dak Cheung district of Sekong province, and 8 villages in Sanxay district of Attapeu province) likely to be affected by impacts to local livelihoods; and ■ The administrative boundaries of Dak Cheung and Sanxay districts, as representative of all areas that could be indirectly affected by changes in ecosystem goods and services.
Central, Provincial, District Government Agencies/Related Organisations		
Central and Provincial Government Agencies	■ Government agencies responsible for environmental approvals for the Project, and relevant Ministries responsible for making technical decisions/assessment and recommendations on the development of the Project, ensuring that all technical, social, financial and legal requirements are strictly met. ■ Government agencies responsible for construction permits and licenses, land acquisition and resettlement, and other activities required for the Project development and operation.	**Key relevant agencies**: ■ Ministry of Natural Resources and Environment (MONRE). ■ Provincial Department of Natural Resources and Environment (PONRE) ■ Ministry of Energy and Mines ■ Ministry of Planning and Investment ■ Other relevant Ministries
District Administration Offices	■ Government agencies at the District level who are responsible for planning and implementation of the Resettlement Plan, construction licenses and permits. ■ Traditional leadership at district and village levels who represent the interest of the PAPs throughout Affected Population. ■ Have potential for the Project to utilise as an information disclosure channel.	Government offices at the District level such as: ■ Dak Cheung District Administration Office ■ Sanxay District Administration Office ■ District Land Department ■ District Agriculture and Forestry Department ■ District Office of Natural Resources and Environment ■ Village leaders of the 32 affected villages (including 24 villages in Dak Cheung District and 8 in Sanxay District)
Aviation Operation/ Airport	■ The sitting of the wind turbines will have to take into consideration of aviation/airport operation because b the physical size, in particular their height, wind farms can have an effect on	Laos airport (Pakse International Airport located 140 km from the Project)

Stakeholder Group	Interest and Role in the Project	Description and Relevant Stakeholders
	aviation (e.g. interfere with aviation radar), especially when placed too close to aerodromes and flight routes.[25]	Vietnam Airport (Da Nang International Airport and Phu Bai Airport locate 115 km and 105 from the Project)
Other Interested Parties		
Electricity Off taker	■ The EVN will be the off taker of electricity produced by the Project	■ Vietnam Electricity (EVN)
Operators of meteorological radar and communication system (radio, TV, mobile-telephone network sites and relay antennas)	■ Wind turbines in line-of-sight of a weather radar can have a negative impact on the weather forecast radar's measurements and aviation radar.[26] [27] ■ Presence of wind farm can potentially impact telecommunication systems[28]	■ Operators of meteorological radar and communication system online of sight of the wind turbines
Non-Governmental Organisations and Community Groups	■ May have interest in the Project in the area of land acquisition and involuntary resettlement, environmental protection and human rights (such as cultural heritage, ethnic minorities/indigenous peoples, biodiversity management, forced labour, etc.). ■ May be interested in the Project mitigation plan and development opportunities such as potential partners in the livelihood restoration programs, community health and safety awareness programs, etc. ■ May have interest in protection and conservation of forests, wildlife and biodiversity in the regions that the Project located in.	■ Primarily community groups, but not limited to: ■ Youth Union ■ Lao Front for National Development ■ Lao Women Union ■ Lao Youths Revolutionary Union ■ Care International ■ Service Fraternel d'Entraide (SFE) ■ International Fund for Agricultural Development (IFAD) ■ World Food Program (WFP) ■ German-Lao Association for Development (GLAD) ■ Projahnmo Research Foundation (PRF) ■ World Wide Fund (WWF) ■ Human Rights Watch ■ BirdLife International

[25] Andrej NOVÁK (2009). Wind Farm and Aviation

[26] Lars Norin (2017) Wind turbine impact on operational weather radar I/Q data: characterization and filtering

[27] M. Brenner et al. (2008) Wind Farm and Radar

[28] I. Angulo et al. (2014) mpact analysis of wind farms on telecommunication services

Stakeholder Group	Interest and Role in the Project	Description and Relevant Stakeholders
		■ Wildlife Conservation Society (WCS) ■ International Union for Conservation of Nature (IUCN)
Nearby Developments	■ Other developments in the Project's vicinity.	■ 115 kV Transmission line of Nam Emoon Hydropower project. ■ Transmission line of Xekamarn 3 Hydropower ■ National road running from Dak Cheung District to Sanxay District ■ Mining projects
Educational and Training Institutions (Academia)	■ Those who may be interested in the Project mitigation plan and development opportunities, such as potential partners in the livelihood restoration programs, educational and training initiatives. ■ Have potential for the Project to utilise as an information disclosure channels.	■ Schools and training educations in in Sanxay District and Dak Cheung District ■ Ban Nam Ngon Neua
Health Institutions	■ Those who may be interested in the Project mitigation plan and development opportunities, such as potential partners in the livelihood restoration programs, community health and safety awareness programs, etc. ■ Have potential for the Project to utilise as an information disclosure channels to disclose information of the Project.	■ Community Hospital of Dak Cheung District ■ Sanxay District Hospital ■ Xieng Luang Dispensary, Dak Dor Dispensary and Dak Run Dispensary in Dak Cheung District ■ Dak Samor Dispensary and Nam Ngon Neua Dispensary in Sanxay District
Local Officials (province down to village levels)	■ Interested in priority development project in their jurisdiction Represent the interest of the PAPs.	■ Village heads of all 32 affected villages ■ District heads of Dak Chueng and Sanxay Districts ■ Governor of Sekong and Attapeu Provinces
Local Services and Businesses	■ May be interested in the Project mitigation plan and development opportunities such as Project procurement programs, business training opportunities (i.e., accommodation providers, service providers).	■ Retail shops ■ Industrial factories such as rice mill, automobile repair shops, drinking water factory, ice-making factory, and furniture factory
Media	■ May have an interest in the priority development projects in Lao PDR, particularly in the area of human rights risks and impacts	■ Local media ■ Social media such as Facebook
Financiers	■ Provide funding for the costs associated with the technical advisory and program management of the Project.	■ Equator Principles Financial Institutions (EPFIs) ■ Asian Development Bank (ADB)

Stakeholder Group	Interest and Role in the Project	Description and Relevant Stakeholders
	■ Ensuring the Project manages environmental and social risks and impacts according to plans through a due diligence process.	■ Japan International Cooperation Agency (JICA) ■ Deutsche Investitions und Entwicklungsgesellschaft (DEG) ■ Nederlandse Financierings-Maatschappii voor Ontwikkelingslanden N.V. (FMO) ■ Asian Infrastructure Investment Bank (AIIB)
Foreign Government Multilateral Agencies	■ May be interested in the priority development projects, particularly in the area of human rights risks and impacts.	■ Government of Vietnam ■ International Union for Conservation of Nature (IUCN) ■ World Health Organisation (WHO) ■ International Labour Organization (ILO) ■ The United Nations Educational, Scientific and Cultural Organization (UNESCO)
Internal Stakeholders	■ Includes but not limited to: supervision consultants, suppliers, Construction Contractors and Contractor's workforce, sub-contractors, etc. who take part in the planning approval, construction, and operation of the Project, who are responsible for fulfilling the contractual obligations to ensure overall success of the Project.	■ IEAD ■ EPC Contractor ■ O&M Contractor ■ Consultants ■ Workers

7.1.2 Stakeholder Mapping

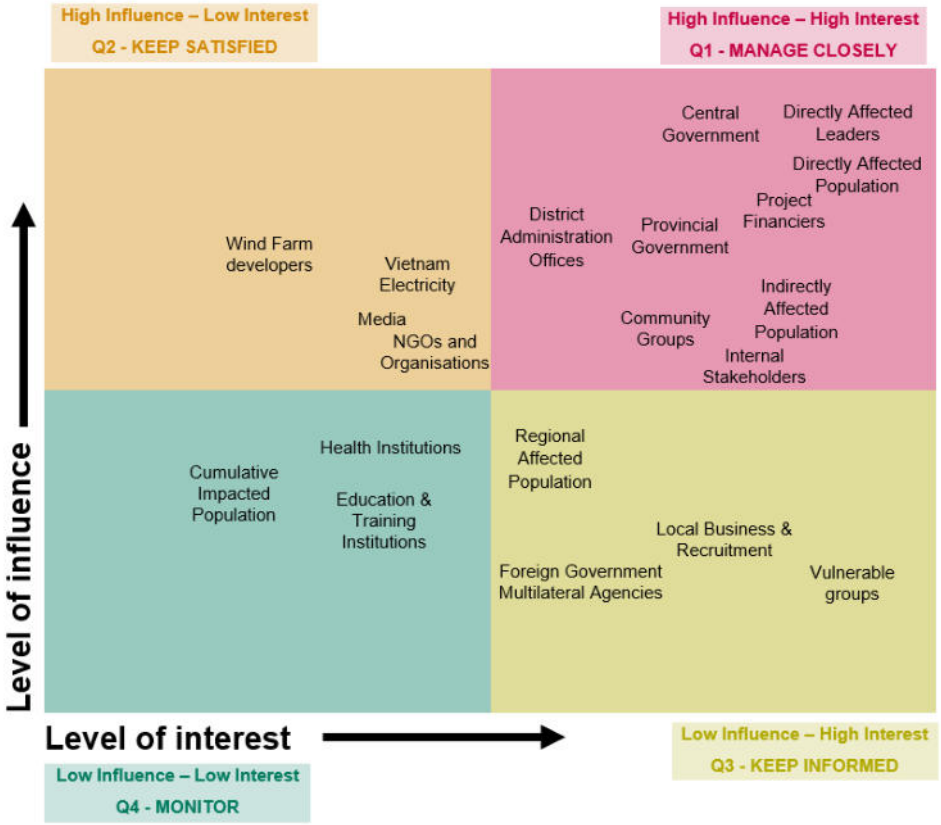
A stakeholder mapping exercise was undertaken to identify and prioritise the Project stakeholders as well as identify issues likely to be of concern to each of the different stakeholders. The matrix presented in ***Figure 7-1*** categorises stakeholders based on their interest in and influence over the Project.

- **Influence:** Refers to the power stakeholders have over a project, including the ability to affect or influence decisions and facilitate its implementation.
- **Interest:** Refers to the priority given by the company to considering and accommodating the stakeholder's needs and interests.

The outcome helps determine the level of engagement and the types of tools that will be used to consult with different stakeholders/stakeholder groups. The mapping exercise categorises stakeholders as follows:

- The stakeholders that appear in the top right quadrant (i.e. in Quadrant 1) are those that need to be managed closely (i.e. the stakeholders that need to be proactively engaged on a regular basis and engagement efforts should be focused on this group). This is because these are the stakeholders that are most interested in the Project and have the potential to influence its outcome (i.e. the ability of the Project to go ahead).
- The stakeholders that appear in Quadrant 2 and Quadrant 3 need to be kept informed – i.e. provided information and consulted on issues of interest to the stakeholders.
- Stakeholders in Quadrant 4 need to be monitored – i.e. informed of key Project aspects. It is important to track if their level of interest or influence changes.

Figure 7-1: Preliminary Stakeholder Mapping Results



Different stakeholder engagement strategies are employed based on the categorisation of the stakeholders; whereby stakeholders with higher levels of influence and interest will be engaged to a greater extent (***Table* 7-2**).

Table 7-2: Stakeholder Engagement Strategies

Q4 - Monitor	Q3 - Keep Informed	Q2 - Keep Satisfied	Q1 - Manage Closely
■ Inform via public communications (for example through the Project website and press communications) ■ Respond to direct requests for further information and conduct engagement if the stakeholders ask to be consulted ■ Monitor for feedback.	■ Make use of interest by informing in low risk areas ■ Inform and consult in interest areas ■ Respond to direct requests for further information.	■ Keep engaged and consult regularly ■ Seek to obtain their support and technical guidance, where relevant ■ Be proactive in communication, provide information and seek views at regular intervals.	■ Inform and consult in interest areas by formal communications such as meetings, letters, written documents ■ Involve in governance and decision-making, as appropriate ■ Maintain ongoing engagement and work collaborative on areas of mutual interest.

The stakeholder list as well as stakeholder analysis and mapping will continue to be revised and incorporated into the SEP revisions according to the ongoing receipt of comments and input from local, national, and international stakeholders directed to the Project.

7.2 Past Consultation and Disclosure

This section provides a summary of stakeholder engagement activities that were undertaken as part of the Planning and Approval phase of the Project.

7.2.1 Local EIA Consultation

Stakeholder engagement activities were undertaken as part of the local EIA report preparation (as detailed in ***Chapter 7***— *Public Consultation and Participation*). Stakeholder engagement activities aimed to inform and receive feedback on the Project, understand and explain the Project's potential social and environmental impacts, and provide updates on the progress.

PAPs and relevant participants such as governmental organizations and relevant Ministries were included in the stakeholder engagement activities. Such activities included consultation meetings at the village level (November 2014 and September 2020), district level (May 2016), and a meeting with technical personnel prior to endorsement of the EIA (July 2018).

Local EIA stakeholder engagement is summarised in ***Table 7-3*** .

Key stakeholder issues and concerns raised, and feedback received during the consultations included:

The Project should provide funding and assistance to improve water supply system (e.g., gravity-fed) to the villages and irrigation systems for rice paddies.

- The Project should help to improve the access road to the village and within village and the access roads to production land e.g., rice, coffee, and cassava plantations.
- The Project should provide funding and assistance to establish and improve school facilities, supplies and personnel.
- The Project should provide funding and assistance to establish and improve dispensary and healthcare centres in the villages.
- The Project should provide funding assistance to establish a village administrative office.
- People in the potentially affected villages should be able to benefit (i.e., access to electricity generated by the Project).
- The Project should provide reasonable and fair compensation to those households affected by land acquisition.
- The Project should provide assistance to poor families in the affected villages. In addition, the Project should provide assistance for improvement of vocations in the villages and offer job opportunities for the village members to work on the Project.
- Request for the Project to provide financial support to the villages/village fund/monthly tax to the villages.

Refer to ***Appendix G*** for detailed summary of EIA consultation.

Table 7-3: Summary of Local EIA Stakeholder Engagement

Date	Objectives	Location	Location and Participants	Issues / Concerns / Expectations	Considerations in the ESIA and/ or Project Design
12-21 Nov 2014	Dissemination of information and consultation at village level	16 villages located in the Project area and nearby areas[29]	Direct and indirect PAPs	■ The Project should provide funding and assistance to improve water supply system (e.g., gravity-fed) to the villages and irrigation systems for rice paddies. ■ The Project should help to improve the access road to the village and within village and the access roads to production land e.g., rice, coffee, and cassava plantations. ■ The Project should provide funding and assistance to establish and improve school facilities, supplies and personnel. ■ The Project should provide funding and assistance to establish and improve dispensary and healthcare centres in the villages. ■ The Project should provide funding assistance to establish a village administrative office. ■ People in the potentially affected villages should be able to benefit (i.e., access to electricity generated by the Project). ■ The Project should provide reasonable and fair compensation to those households affected by land acquisition[1]	■ Information dissemination is be considered in the ESIA and SEP. A SEP will be prepared for the Project including future and on-going engagement required to ensure stakeholders are provided sufficient information on the potential impacts. ■ The impact assessment including information on mitigation measures for the social receptors is provided in ***Section 9.5*** of the ESIA Report. ■ Impacts to livelihoods and land use, including rice paddies, is included in Section 8.5.3 of the ESIA Report. This includes proposed mitigation measures. ■ Land and economic displacement are assessed in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures. The Project will ensure all required processes for land acquisition are conducted in conjunction with relevant stakeholders. ■ Impacts and processes for land acquisition are provided in ***Section 9.5.3*** of the ESIA Report. Note that this is based on preliminary land and asset registration undertaken by Innogreen in November and December 2021. ■ Village heads will be informed prior to construction, this commitment is
7-26 Sep 2020	Dissemination of information related to change of location and boundaries of wind turbine towers, benefits, and potential impacts of the Project. In addition, conducted consultation at village level	18 village located in the Project area[30]	Direct and indirect PAPs		

[29] Due to changes to Project design and layout over time, some of the villages previously consulted are not the same as the current 32 villages that were considered in the ESIA.
[30] Ibid.

Date	Objectives	Location	Location and Participants	Issues / Concerns / Expectations	Considerations in the ESIA and/ or Project Design
				■ The Project should provide assistance to poor families in the affected villages. In addition, the Project should provide assistance for improvement of vocations in the villages and offer job opportunities for the village members to work on the Project. ■ Request for the Project to provide financial support to the villages/village fund/monthly tax to the villages.	included in ***Section 10*** (ESMP) of the ESIA Report.
May 2016	Consultation at district level	District Administration Office of Dak Cheung District	Deputy Chief of Dak Cheung District and Sanxay District, Deputy Provincial of Department of Natural Resources and Environmental of Sekong Province and Attapeu provinces, and other participants, totaling to 70 persons	■ The general opinions show agreement and consensus with the construction and development of the 600 MW Monsoon Wind Farm Project. ■ Request to have the Environmental Management and Monitoring Plan including the Socio-Economic Development Plan and budget of this investment project. ■ Request to conduct detailed study of data on impacts to the peoples and to closely coordinate with the locality to clearly determine compensation for production land of the peoples; and to ensure the coordination and consultation in each level to create awareness and understanding about this project development plan. Request to increase the technical information of the project to allow to know the risks and impacts and avoid the anxieties relating to the construction of the project.	■ The impact assessment including information on mitigation measures for the social receptors is provided in ***Section 9.5*** of the ESIA Report ■ Impacts to livelihoods and land use, including rice paddies, is included in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures. ■ Impacts to community health and safety are assessed in ***Section 9.5.4*** of the ESIA Report. This includes proposed mitigation measures. ■ Information dissemination will be considered in the ESIA and SEP. A SEP will be prepared for the Project including future and on-going engagement required to ensure stakeholders are provided sufficient information on the potential impacts. ■ Land and economic displacement are assessed in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures. The Project will ensure all required processes for land

Date	Objectives	Location	Location and Participants	Issues / Concerns / Expectations	Considerations in the ESIA and/ or Project Design
				■ Request to conduct the study on the impacts in each phase of the project and the activities of the project in a detailed and clear manner and make comparison of the data of the environmental standards values in the project area. ■ Request to contribute to assist in the construction and improvement of infrastructure, improvement of livelihood of the people in the project area to ensure public participation in various activities of the project.	acquisition are conducted in conjunction with relevant stakeholders
July 2018	Consultation Meeting at Technical Level to endorse the EIA report (dated September 2020)	Meeting room of the Provincial DONRE if Sekong Province	General Director of DONRE Policy, Deputy Director of Provincial DONRE of Sekong and Attapeu Provinces, and participants from other agencies of central, provincial and district levels, totaling to 63 participants	■ The opinions and proposals of the participants of this meeting may be summarized as follows: ■ The study on risk of impacts shall separate and analyze to allow to clearly see the direct impacts and indirect impacts, such as: ■ Impact on production land. ■ Impact on area which is overlapping with the area of other development project located nearby. ■ Plan of the access road to the tower foundations. ■ Budget for environmental management activities. ■ Plan of road use for transport of materials to the project. ■ Wastes and wastewater management. ■ Supervision of workers.	■ Impacts to livelihoods and land use, including rice paddies, is included in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures ■ The impact assessment including information on mitigation measures for the social receptors is provided in ***Section 9.5*** of the ESIA Report. ■ Impacts and processes for land acquisition are provided in ***Section 9.5.3*** of the ESIA Report. Note that this is based on preliminary land and asset registration undertaken by Innogreen in November and December 2021. ■ Land and economic displacement are assessed in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures. The Project will ensure all required processes for land acquisition are conducted in conjunction with relevant stakeholders.

Date	Objectives	Location	Location and Participants	Issues / Concerns / Expectations	Considerations in the ESIA and/ or Project Design
				■ Plan of management and restoration of borrow pits. ■ Prohibitions of the project relating to the environmental management, such as: hunting, logging, fishing, etc. ■ Impact on forests; and ■ Impact on birds. ■ In order to ensure clear analysis of the risk of impacts on each aspect, it is required to make more detailed and clearer analysis, such as: ■ The impact assessment shall be based on each activity of the project and shall be summarized in the table that show the impacts in full. ■ Data of the project development plan to allow to see the overall picture of the project development plan.	
July 2018	Consultation meeting at Provincial/Central level	Information has not been included in the EIA	Information has not been included in the EIA	■ The general opinions show agreement and consensus with the construction and development of the 600 MW Monsoon Wind Farm Project. ■ Request to have the Environmental Management and Monitoring Plan including the Socio-Economic Development Plan and budget of this investment project. ■ Request to conduct detailed study of data on impacts to the peoples and to closely coordinate with the locality to clearly determine compensation for production land of the peoples; and to ensure the	■ The impact assessment including information on mitigation measures for the social receptors is provided in ***Section 9.5*** of the ESIA Report ■ Impacts to livelihoods and land use, including rice paddies, is included in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures. ■ Impacts to community health and safety are assessed in ***Section 9.5.4*** of the ESIA Report. This includes proposed mitigation measures. ■ Information dissemination will be considered in the ESIA and SEP. A

Date	Objectives	Location	Location and Participants	Issues / Concerns / Expectations	Considerations in the ESIA and/ or Project Design
				coordination and consultation in each level to create awareness and understanding about this project development plan. Request to increase the technical information of the project to allow to know the risks and impacts and avoid the anxieties relating to the construction of the project. ■ Request to conduct the study on the impacts in each phase of the project and the activities of the project in a detailed and clear manner and make comparison of the data of the environmental standards values in the project area. ■ Request to contribute to assist in the construction and improvement of infrastructure, improvement of livelihood of the people in the project area in order to ensure public participation in various activities of the project.	SEP will be prepared for the Project including future and on-going engagement required to ensure stakeholders are provided sufficient information on the potential impacts. ■ Land and economic displacement are assessed in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures. The Project will ensure all required processes for land acquisition are conducted in conjunction with relevant stakeholders

Source: ESIA dated September 2020

7.2.2 ESIA, RP and CEGDP Consultations

7.2.2.1 Consultations in November and December 2021

Consultation for the supplementary ESIA was conducted in November and December 2021 with focuses on:

- Disclosing updated Project information and development status to the 32 potentially affected communities and other stakeholders including the supplementary ESIA studies, the risks, impacts, and opportunities for the Project.
- Providing the affected communities and stakeholders with opportunities to express their views on Project risks, impacts, and mitigation measures.
- Soliciting stakeholders' ideas, opinions, and recommendations on various alternatives.
- Assessing the level of stakeholder interest and support for the Project and enable stakeholder views to be taken into account in Project design and environmental and social mitigation measures as well as development of benefits and opportunities.
- Undertaking extensive stakeholder engagement for land acquisition and resettlement.

Consultation was planned to be carried out in a village meeting format that was appropriate to the cultural norms of the potentially affected communities. Consultation was also planned to be provided as part of focus group discussions (FGDs) with women, youth, and ethnic community members in the PAPs. However, due to the COVID-19 pandemic, government restrictions were imposed on the provinces where the Project is located, for the majority of the duration in the second half of 2021. As such, the Project was not able to undertake consultation in large group, and FGDs in small groups were conducted instead. The local villagers were also hesitant to engage in group activities due to the risk of spreading COVID-19. The Project team was apprehensive of potential risks associated with the undertaking of the consultation plan, so a modification to the plan was implemented with an aim to fill the consultation gaps while respecting the needs to have a COVID-19-safe field operation during the pandemic.

Accordingly, modification of the consultation plan consisted of:

- Consultation with individuals during the household socio-economic surveys of the affected population.
- Consultation during key informant interviews with village leaders, teachers, healthcare workers, religious leaders, and others; and
- Consultation (FGD) with representatives of women groups, youth groups, livelihood groups, ethnic minority groups.

A total of 345 people were consulted during the process through FGDs and Key Informant Interview (KIIs), in which 181 were women, 76 were ethnic group representatives and 75 were youth representatives. As prior engagements suggest that most of the local communities can communicate in Laos, the engagement was therefore conducted in Laos and translated to Triang language with the help of the Project's village coordinators or in some meetings by village heads. ***Figure 7-2*** illustrates how FGDs were carried out while ensuring COVID-19 safety measures i.e., face masks for all participants and social distancing while conducting FGDs.

Prior to conducting FGDs and KIIs, information related to the Project was provided to the participants to ensure that the following consultations will be meaningful and informed. In Dak Tiem village (the first village engaged), presentation about the Project was provided to group of participants as shown in ***Figure 7-3***. This approach in particular was able to provide visual information which facilitated the participants' understanding of the Project impacts. COVID-19 safety measures ensured the safety for all participants with face masks handed out to all participants before joining the session. Due to Covid-19 outbreak situation, it was not possible to carry out this approach in the remaining villages.

Alternatively, brief Project information was given in smaller groups to all FGD groups prior to the start of FGD and a banner providing Project information (***Figure 7-5***) was displayed in the villages. The information on the banner included Project location, Project components, example visual of wind farm project and Project's number for the villagers to contact in case of any questions or concerns arise. This grievance channel was also informed to people during FGDs/KIIs.

Figure 7-2: FGDs Activities

FGD with women group in Dak Dom Village

FGD with women group in Dak Ta-ok Noi Village

FGD with Youth representative in Dak Yen Village

FGD with Youth representative in Dak Yang Village

FGD with livelihood group in Dak Xeum Village

FGD with livelihood group in Dak Nong Village

Figure 7-3: Project Information Disclosure

Project information disclosure at Dak Tiem Village on 8 November 2021

The Project information that was disclosed during the consultation include:

- Project Location, Project lifecycle, and Project Components (WTGs, Transmission Lines, Sub-stations, etc.)
- Project schedule and Project activities in each phase
- Potential Physical, Biological and Social Impacts of the Project
- Potential Project land acquisition impact (requirement of land for WTG construction, internal road, transmission line, etc.)
- Land acquisition and compensation process
- Visuals to demonstrate Project activities
- Potential Physical, Biological and Social Impacts of the Project
- Potential benefits and opportunities for the villagers
- The Project Owner's policy

Example of PowerPoint presentation used for Project information disclosure is provided in ***Figure 7-4*** and the full PowerPoint presentation to ***Appendix H.***

Figure 7-4: Project Information Disclosure Material (PowerPoint)

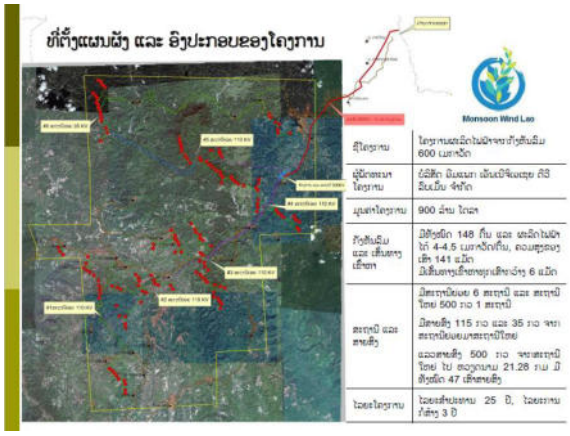
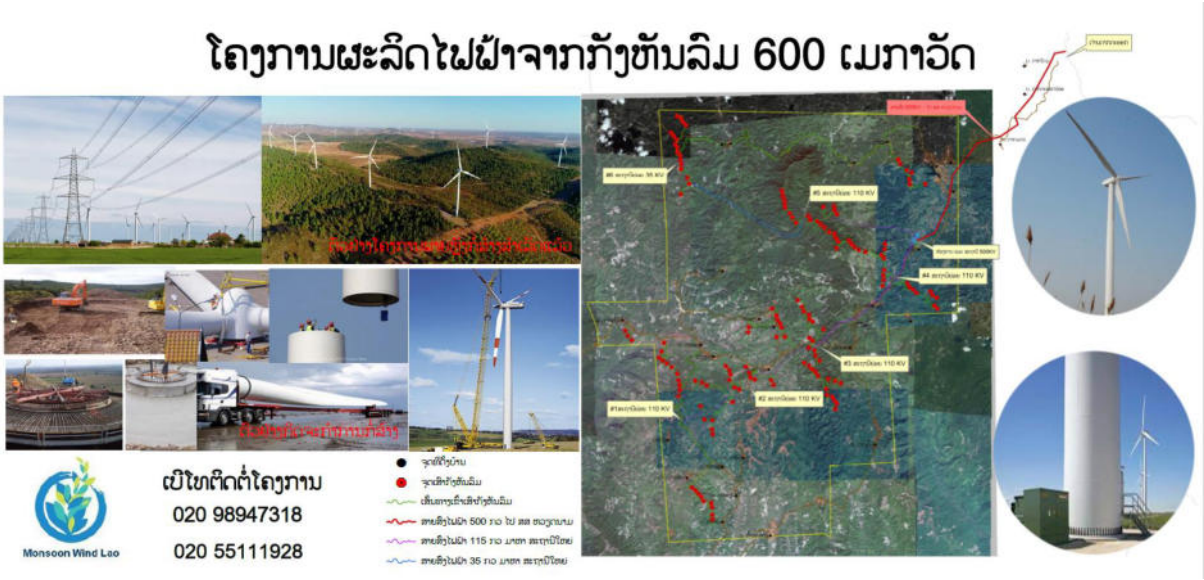


Figure 7-5: Project Information Disclosure Material (Banner)



A summary of supplementary ESIA consultation is provided in ***Table 7-4*** and further detailed in ***Appendix I*** and the questionnaire guide for FGDs/KIIs is provided in ***Appendix JAppendix E.*** Key stakeholder issues and concerns raised and feedback received during the consultation include are included in
Table 7-5.

Table 7-4: Summary of Supplemental ESIA Stakeholder Engagement

Date	Objectives	Participants	Location	Outcomes
06 Oct - 23 Nov 2021	■ Dissemination of information ■ Consultation at village level (through FGDs and KIIs) ■ Social baseline data collection through socio-economic HH survey and FGDs and KIIs	Direct and indirect PAPs	23 villages located in Dak Cheung District, Sekong Province	■ Collect socio-economic data to update the social baseline ■ Consult with PAPs on the Project development and obtain opinions, suggestions and concerns of affected households and communities (Refer to ***Table 7-5***).
	○ KIIs with local authorities	23 village heads of the affected villages		
	○ FGDs with livelihood groups	69 farmers, livestock, laborers, NTFPs collection		
	○ FGD with women groups	82 women		
	○ FGD with ethnic groups	56 ethnic group representatives (41 Triang; 4 Katu; 9 Yae; and 2 Lao)		
	○ FGD with youth groups	57 youth		
	○ KIIs with healthcare personnel	9 healthcare personnel		
	○ NGO (CARE)	1 CARE representative[31]	Dak Cheung District	■ Consult with NGO representative on community needs, active NGOs, and their programs in local communities (Refer to ***Table 7-5***).
06 - 10 Dec 2021	■ Dissemination of information ■ Consultation at village level (through FGDs and KIIs)	Direct and indirect PAPs	8 villages located in Sanxay District, Attapeu Province	■ Collect socio-economic data to update the social baseline

[31] Representative of CARE, an NGO active on gender, food security, livelihood and assistance to vulnerable groups was present in Dak Cheung District for the KII. The programs that they have been implemented in Dak Cheung District include:
- In department of health CARE and partnership run Reproductive Maternal New-Born Child and Adolescent Health (RMNCH) in all health centre and hospital;
- CARE have farmer work of Gender Equality and Women's Empowerment by support the coffee cultivation and make women's group;
- Another that CARE Foods security program and assistance to valuable people.

Other existing NGOs in Dak Cheung District include Promotion of Family Health Association (PFHA) focus on health promotion, Service Fraternel d'Entraide (SFE) and World Food Program. However, it was noted that these NGOs do not have working unit/representative stationed in Dak Cheung District, they would come to the District to implement/monitor their programs annually, once in two years or once in 3-4 years.

Date	Objectives	Participants	Location	Outcomes
	■ Social baseline data collection through socio-economic HH survey and FGDs and KIIs			■ Consult with PAPs on the Project development and obtain opinions, suggestions and concerns of affected households and communities (Refer to ***Table 7-5***).
	○ KIIs with local authorities	8 villages heads of the affected villages		
	○ FGDs with livelihood groups	20 farmers, livestock, laborers and NTFPs collection		
	○ FGD with women groups	17 women		
	○ FGD with ethnic groups	20 ethnic group representatives (17 Triang and 3 Ar Luk)		
	○ FGD with youth groups	18 youth		
	○ KIIs with healthcare personnel	3 healthcare personnel		

Source: FGDs and KIIs undertaken by Innogreen in November and December 2021

Table 7-5: Key Stakeholder Concerns and Relevance for the Supplemental ESIA and various Management Plans

Stakeholder Concerns/ Expectations	Relevant ESIA and Management Plan Considerations	Actions Taken
The Project should minimise impacts to sensitive receptors and houses and paddy field as much as possible.	The impact assessment including information on mitigation measures for the social receptors is provided in ***Section 9.5*** of the ESIA Report.	Impacts were minimized by reducing the number of WTGs under a new design and avoiding houses and paddy fields. WTGs have been relocated to ensure distance from villages. The nearest WTG to village is located more than 500 m from the village
The Project development will impact the cultivation land, particularly rice paddy field as suitable land for rice cultivation is highly limited due to mountainous terrain of the region.	RP and livelihood restoration programs have been developed The Project will follow land acquisition procedure and implement livelihood restoration programs as outlined in the RP	Impacts were minimized by reducing the number of WTGs under a new design and avoiding houses and paddy field
The Project should ensure that there will be no encroachment into villagers' land containing houses/dwellings.	The Project will not impact residential houses.	Impacts were minimized by reducing the number of WTGs under a new design and avoiding houses and paddy field
Concern about nuisance from noise from wind turbines during operation.	Noise impacts (including from turbines) are assessed in ***Section 9.3.7*** and ***Section 9.5.7***of the ESIA Report. This includes proposed mitigation measures.	WTGs have been relocated to ensure distance from villages. The nearest WTG to village is located more than 500 m from the village
Concern about nuisance from shadow flicker and negative impacts on agricultural productivity.	Shadow flicker impacts are assessed in ***Section 9.3.10*** and ***Section 9.5.7*** of the ESIA Report. This includes proposed mitigation measures.	WTGs have been relocated to ensure distance from villages. The nearest WTG to village is located more than 500 m from the village
Concern that the Project development may impact cemeteries of the village.	The Project will not affect cemeteries.	Impacts were minimized by re-routing of transmission line and access road to avoid all cemeteries
Some people expressed that they cannot articulate their concerns as they do not have sufficient information about the Project and its potential impacts	Information dissemination will be considered in the ESIA and SEP. A SEP (this document) has been prepared for the Project including future and on-going engagement required to ensure stakeholders are provided sufficient information on the potential impacts.	Project Information disclosure and consultations were conducted in July 2022. Refer to ***Section 7.2.2.3*** for more details.
Concerns about unfair compensation for those impacted by land acquisition of the Project, and there will be no replacement land for cultivation and animal husbandry and therefore people will lose their main source of livelihood.	RP and livelihood restoration programs have been developed. The Project will follow land acquisition procedure and implement livelihood restoration programs as outlined in the RP	N/A
Concerns around safety of life and property and livestock of households	Impacts to community health and safety are assessed in ***Section 9.5.4***	N/A

Stakeholder Concerns/ Expectations	Relevant ESIA and Management Plan Considerations	Actions Taken
nearby the wind towers and safety of those that conduct agricultural activities under the transmission line.	of the ESIA Report. This includes proposed mitigation measures.	
Prior to commencement of the Project construction, the village heads should be informed.	Village heads will be informed prior to construction, this commitment is included in ***Section 10*** (ESMP) of the ESIA Report.	N/A
The people in the affected villages were not sure if they can use electricity generated by the Project.	Household solar power systems will be provided to the affected villages. Priority will be given to the households affected by the Project's land acquisition, then poor households within the Project's affected communities, and finally the entire the affected villages if possible. Refer to ***Section 9.5.2*** and CEGDP for more details.	During the consultation with villages in July 2022, it was clarified to the villagers that they will be provided with solar power system, not electricity generated by the Project
During construction and operation of the Project, there will be influx of workers and people from outside to the villages. There are concerns that these people may bring transactional sex to villagers, disrupt community dynamics, increase gender-based violence, and/or negatively impact on public infrastructure and resources.	Impacts from worker influx are assessed in ***Section 9.5.6*** of the ESIA Report. Local Content and Influx Management Plan and Worker Code of Conduct will be developed.	N/A
Concerns about the Project's impact on landslides	Impacts from unplanned events (including those impacts as a consequence of natural hazards) are assessed in ***Section 9.6.3*** of the ESIA Report. This includes proposed mitigation measures.	NA
Concerns about the Project's impacts to forest resources as people are highly dependent on NTFP collection from the forests.	Impacts on communities' livelihoods associated with NTFPs are assessed in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures. Livelihood restoration programs and CEGDP has been prepared to address impacts to livelihood due to loss of NTFP collection area.	NAThe reduction in number of WTGs from 148 to 133 reduced impacts to NTFP collection area by 57.55 ha

The general opinions of stakeholders engaged in FGDs and KIIs show that the majority of the people agree with the development of the Project. This is because they perceive various benefits associated with the Project, particularly economic opportunities. They believe that the Project will create more job opportunities for the people in the villages, new developments will come with Project development such as improved road connections and other facilities, the opportunity to increase tourism due to the wind farm being a new tourist attraction.

In addition to the main concerns provided in ***Table 7-5***, the stakeholders engaged in FGDs and KIIs also provided suggestions to the Project which reflect communities' needs:

- The Project should provide support and assistance to improve agriculture and livestock to increase productivity.
- The Project to provide support to improve and enhance coffee plantations and coffee market linkage, coffee initiatives to promote coffee product development, factory, and store for coffee products.

- The Project should provide electricity for those households that currently do not have access to the grid and public infrastructure (e.g., schools, healthcare centres) should also have access to electricity from the Project.
- The Project should help improve marketing and trading of agricultural products such as coffee, rice and fruits and create road connection to the markets.
- The Project should provide assistance to improve health facilities.
- The Project should provide assistance to improve education such as building school facilities and providing school supplies.
- The Project should provide assistance to poor households.
- The Project should have programs to improve nutrition and food sufficiency of the villages.
- The Project should improve infrastructure in the villages including water supply system, irrigation, and telephone signal.
- The Project should create new employment opportunities for the villages such as recruitment of local labours to work in the Project development.
- The Project should provide training opportunities for youth in the affected villages as this will help them in accessing job opportunities.

7.2.2.2 Consultations Conducted by the Compensation Committee on Unit Compensation Rates

Dak Cheung District, Sekong Province

On 17 February 2022, Dak Cheung District Governor and Department of Natural Resources and Environmental and other relevant authorities, the Project developer and its local E&S consultant, and village heads from 23 villages in Dak Cheung District. Total participants of 61 people (of which 12 were women)

The meeting agreed on the affected area from the Project land acquisition—total affected area of 748.88 ha (136.7 ha permanently affected and 612.18 ha temporarily affected). Of this affected land 139.31 ha are agricultural land (6.45 permanently affected and 132.86 temporarily affected). The impact is from land acquisition for 128 WTGs, access roads, 4 substations,115 kV and 35 kV transmission line and one 500 kV substation.

The meeting agreed that the Project land acquisition impacts 23 villages in Dak Cheung Province. A total of 242 households are to be affected (138 households will be impacted from WTGs and 104 households will be impacted from 500 kV transmission line)

The meeting agreed for the Provincial Compensation Committee undertaken determination compensation unite rates

It was recommended for the Project developer to participate with the Provincial, District and Village authorities to undertake DMS which should be approved by affected households and village heads. Thereafter, compensation costs should be calculated for affected households.

After compensation costs are calculated, the authorities suggested that the Project developer organize a meeting to inform affected households of compensation amount in all villages, including calculation methods. Following this, the Provincial and District Committee, together with the Project developer will notify the affected households of final compensation costs and obtain their signature prior to compensation payment.

Minute of meeting of this meeting (refer to ESIA ***Appendix FK***)

On 31 March 2022, the Vice Governor of Sekong and the relevant provincial and district, and Project developer and its E&S consultant (total 28 participants, of which 3 are female) to approve compensation unit rates for 600 MW wind farm project and 500 kV transmission line.

The Provincial Compensation Committee presented draft compensation unit rates to the meeting, the meeting consulted regarding the compensation unit rates and agreed on the followings:

The meeting agreed and approved the draft compensation unit rates

The Compensation Committee should include comments and recommendations from this meeting to revise the compensation unit rates. The determination of compensation unit rates should be based on the standard price outlined by relevant department (e.g., land department and forestry and agriculture department) and to confirm the price with these respective departments. In addition, the compensation units should also reflect the current market price.

The Compensation Committee to complete unit compensation rates revision by 18 April 2022 to be presented to the District Governor.

Minute of meeting of this meeting (refer to ESIA ***Appendix LAppendix G***).

Sanxay District, Attapeu Province

The Committee conducts a market price survey of affect assets and consults with project affected villages unit compensation rates for various types of assets on 30 March 2022 with five villages including Dak Nong, Dak Padou, Dak Samor, Dak Xeum, and Dak Yok with the District Committee. It was observed that at the end of each minute of meetings, presented a list of compensation unit rates discussed with the village representatives. Minute of meeting of this meeting (refer to ESIA ***Appendix M***)

On 12 May 2022, the meeting was held to report on the consultation on compensation unit rates with village head and affected households conducted in March-April 2022 and approve compensation unit rates.

During 30-31 March and 1-2 April 2022, Provincial, District and Village Compensation Committee agreed on compensation unit rates. A total of 8 villages within Sanxay District will be impacted, summary of impact and compensation unt rates are as follows:

Dak Nong Village: Impacts from 115 kV transmission line and 2 WTGs. Communal land and agricultural land are impacted. The Compensation Committee presented the compensation unit rates to land and crops to the village head and one affected household. The meeting agreed on the followings with the village head and affected households:

- Coffee (less than 2 years old) 15,000 LAK and improved the price for coffee plants older than 2 years
- Small coffee 90,000 LAK and large coffee 100,000 LAK
- Cost for Heet-Kong (in Triang language Heet-Kong means inherited traditions or ritual practices and Kong meaning social norms, customs, or guidelines) of the village 3,3400,000 LAK
- Additionally, the village requested the Project to provide scholarship for students, water supply, vehicles for the village, village office (e.g., computer) and toilets.

Dak Samor Village: 3 WTGs impacts productive and communal forests and access road impacts 6 households and 7 land parcels. The Committee presented compensation unit rates for land and crops to affected households and village heads and the units were agreed by the village head and affected households. In addition, the Project should provide 1,670,000 LAK for Heet-Kong of the village. The village also requested the Project to support on water supply (Nam Lin) and provide electricity for new houses.

Dak Yok Village: Communal land will be impacted by 2 WTGs. The Committee presented compensation unit rates for land and crops to village head and the units was agreed by the village

head. In addition, the Project should provide 1,060,000 LAK for Heet-Kong of the village. The village also requested the Project to help with water supply (dug well) and village office.

Dak Xuem Village: Communal land is impacted by 6 WTGs. The Committee presented compensation unit rates for land and crops to village head and the units was agreed by the village head. In addition, the Project should provide 4,500,000 LAK for Heet-Kong of the village.

Dak Padou Village: land will be impacted by 9 WTGs, the meeting agreed on the compensation unit rates for land and crops as follows:

Recommendations from village head and affected households:

- Coffee (less than 2 years) 150,000 LAK/tree
- Coffee (3-5 years, no productivity) 350,000 LAK/tree
- Coffee (3-5 years, productivity) 400,000 LAK/tree
- Coffee (productivity) 450,000 LAK/tree
- Coffee (Noi) large size in productivity 525.000 LAK/tree

The village suggested the Project to perform ritual according to villages' Heet-Kong which costs approximately 2,134,000 LAK.

Dak Xied, Dak Dor and Namgnonnuea villages are not impacted by Project land acquisition. The Provincial Compensation Committee, Project developer and village heads agreed to perform ritual according to villages' Heet-Kong.

Minute of meeting of this meeting (refer to ***Appendix N***)

7.2.2.3 Consultation and Project Information Disclosure in July and September 2022

Following the completion of ESIA study and development of management plans (MPs), information related to ESIA findings, proposed mitigation measures and MPs are disclosed to PAPs in 16 villages. The participants of the consultation include village heads and PAPs – women were ensured to participate in the sessions in all villages, Project developer (IEAD) and its local E&S consultant (Innogreen) and international E&S consultant (ERM), lenders' E&S representatives including ADB (and Artelia as its lender E&S advisor), DEG (also representing FMO), AIIB and JICA. The participants were asked to sign registration form as evidence of participation in the information disclosure activity (refer to ***Appendix JO***). The summary of July 2022 consultaiton is provided in ***Table 7-6*** and the minutes of meeting is provided in ***Appendix O***.

The Project information was disclosed through presentation of ESIA study findings and proposed mitigation measures and management plans in basic Laos given by Innogreen. During the presentation, the affected people were given the opportunity to ask questions related to topics discussed, particularly women. The presenter would ask questions to the participants from time to time to ensure their understanding of topic discussed. Village coordinator and village head assisted with translating to Triang language (where needed) to facilitate the discussions and understanding of the affected people. ***Figure 7-6*** presents photos of information disclosure and consultation activities and ***Figure 7-7*** presents disclosure materials utilized and disseminated during the activities.

The presentation covers key findings of the ESIA study and proposed mitigation measures and management plan (refer to ***Appendix P***), including:

- Key Project components (with photos to give clear illustration to the participants). Information on land requirements for WTGs and TLs, area of restriction within ROW including activities allowed and not allowed within the ROW.
- Project activities including construction and installation of WTGs and transmission line and transportation activities

- Key environmental impacts include topography and landscape impact, shadow flicker impact and impact to water quality during construction activities
- Key biological impacts include reduction in forest area and increased hunting and poaching associated with improved access roads
- Social impacts include land acquisition impacts, impacts to cultural heritage resources, community health and safety impact and, impacts associated with influx

Resettlement Plan:

- Village specific land requirement impacts
- Cut-off date and eligibility and entitlement
- Proposed livelihood restoration programs
- Seek to understand process and involvement of the affected people in resettlement process e.g., consultation by compensation committee on compensation unit rate
- Compensation unit rates
- Next steps to be undertaken for resettlement and compensation process

CEGDP:

- Understand community needs for CEGDP
- Proposed community and ethnic group development initiatives and programs
- Feedback from the affected people on community needs and proposed initiatives and programs

CHMP:

- Proposed mitigation measures
- Feedback from communities on village requirements for the Project to comply with villages' culture, traditions, customs

Grievance Mechanism with contact details

In addition to the presentation, disclosure booklet/handbook in Laos language (refer to ***Appendix Q***) was also distributed during the consultation. The booklet covers similar key contents as the presentation but with more details for PAPs to refer to.

After the presentation, the participants were also given opportunities to ask questions, share their concerns or needs to the Project developer or the E&S consultants. The participants were consulted after the information disclosure activity with focuses on:

- Better understand the villagers' beliefs towards the Phou Koungking Mountain and the spirit that inhabits the mountain and Dak Bong cemetery.
- Solicit villagers' concerns regarding Project development in Phou Koungking area and Dak Bong cemetery.
- Understand conditions and requirements from the villagers in order for the Project to enter and develop Project components within Phou Koungking area and Dak Bong cemetery, such as particular ceremonies or rituals that should be undertaken by the Project according to the villagers' beliefs.
- To assess the impacts of project activities within the Phou Koungking and Dak Bong cemetery area against ADB's criteria for the application of BCS and IFC's criteria for the application of FPIC and to confirm that affected villages do not object to such project activities.
- Better understand needs and priority of villages for community development programs.

- Understand the general perception of villagers towards the Project and if any concerns or recommendations for the Project
- Understand resettlement and compensation process undertaken to date and participation of affected people in determination of compensation unit rates

Figure 7-6: Information Disclosure and Consultation Activities

Meetings with District and Provincial Authorities, 18 July 2022

Dak Tiem Village, 19 July 2022

Prao Village, 19 July 2022

Dak Terb, 19 July 2022

Dak Lern Village, 19 July 2022

Dak Rant Village, 19 July 2022

KII in Dak Lern, 20 July 2022

KII in Dak Lern, 20 July 2022 (Project's village coordinator (on the right) was present to facilitate translation to Tirang)

Figure 7-7: Disclosure Materials

PowerPoint Presentation and a large map

Project Information Booklet (in Laos language)

Information disclosure and consultations were undertaken with the remaining 16 villages in September 2022 with the same objectives and approach as those conducted in July 2022. The summary of July-September 2022 consultation is provided in **Table 7-6**. Minuts of meeting (in Laos and English) and attendee registration of September 2022 consultation are provided in ***Appendix R.***

Table 7-6: Summary of Consultation in July and September 2022

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
Monday 18 July 2022	13:00-17:00	Meetings with District and Provincial Authorities **Location:** Department of Natural Resources and Environment of Sekong Province **Participants:** ■ Sekong governor ■ Attapeu governor ■ Dak Cheung district officers ■ Sanxay district officers	■ The provincial and district authorities are in favour of the Project and indicated to have been working with the Project developer since 2014 ■ Innogreen will provide the provincial authorities with the final DMS data by 29 July 2022 or early August, thereafter the provincial authority will proceed with issuance of official cut-off date. It was agreed that the last day of DMS survey will be used as cut-off date i.e., 21 June 2022 for Dak Cheung District and 18 June 2022 for Sanxay District. ■ Compensation Committee consisting provincial and district authorities and Project developer was established. The Committee consulted affected people on compensation unit rates in the process of determining compensation unit rates ■ The authority is working with IEAD to identify replacement land. However, replacement land for particularly paddy field is limited in this area. Livelihood restoration plans such as livestock raising, or improved agriculture will need to be in place to ensure the livelihood and quality of life of affected people are equal or better than pre-land acquisition impact. ■ For transmission line, area within ROW (e.g., 70 m for 500 kV) annual crops and livestock are allowed. Structures and tall trees (trees should not be taller than 3 m) are not allowed. 100% compensation for structure, rice paddy compensation for 10 years of affected productivity. Compensation for trees that have to be cut. ■ It is noted that most people in this area do not have legal title to land because it is a remote area and land titling activity has	■ Information has been included in RP and CEGDP

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			not covered this area yet. For Attapeu province, land will be compensated between 25,000 – 50,000 LAK/m^2 depending on the type of land. The resettlement and compensation process involves the following committees: ■ Compensation committee ■ Livelihood restoration committee ■ Monitoring Committee ■ With regards to grievance mechanism, if PAPs are not satisfied with compensation costs, the relevant authorities will work with PAPs on how to make them satisfy. This may involve create of new occupations or sustainable livelihood restoration programs such as planting other commercial crops, cattle, tourism, etc.	
Tuesday, 19 July 2022	09:00-12:00	Consultation with Dak Tiem, Dak Xeng and Xiengluang villages **Location:** Dak Tiem School **Participants:** Village heads and villagers of Dak Tiem, Dak Xeng and Xiengluang villages (total X people)	**Main concerns include:** ■ Impacts to agricultural land ■ Safety risks associated with transportation of Project components during construction. ■ Wastewater and sedimentation from project construction activities will enter the water sources of the village ■ Impacts of WTGs during operation to productivity of agricultural land. ■ Noise from WTGs ■ Dust from construction activities **CDP Needs and priority (Dak Tiem Village)** ■ Healthcare facility improvement and medical supplies + transportation to healthcare facility ■ Support plantation of fruit trees such as pomelo, rambutan, etc. ■ Support on education supplies and sport equipment	Impacts to livelihoods and land use, including rice paddies, is included in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures. Land and economic displacement are assessed in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures. The Project will ensure all required processes for land acquisition are conducted in conjunction with relevant stakeholders. Noise impacts (including from turbines) are assessed in ***Section 9.3.7*** and ***Section 9.5.7***of the ESIA Report. This includes proposed mitigation measures.

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			■ The Project to ensure that the roads are not too dangerous where villagers can also use it ■ Water supply and Irrigation system as the village experiences water shortage during dry season ■ Village office with computers ■ The Project to comply with village's Heet-Kong (Heet (long inherited traditions) and Kong (social norm, custom or guidelines)) ■ Scholarship for higher education ■ Livelihood/Occupation/Vocational training ■ CDP Needs and priority (Xieng Luang Village) ■ Irrigation system for rice paddies ■ The Project to comply with village's Heet-Kong ■ Request for machinery for agriculture **CDP Needs and priority (Dak Xeng Village)** ■ Concerns about impact of Project land acquisition on rice paddies as currently they hardly have sufficient rice for consumption ■ Support on coffee plantation ■ The Project to comply with village's Heet-Kong ■ Support for education and scholarships for students ■ Water supply and irrigation system **CDP Needs and priority (Women)** ■ Healthcare facility improvement and medical supplies ■ Educational supplies ■ Support for poor facilities ■ Water supply e.g., dug well for dry season **CDP Needs and priority (Youth)** ■ Improve education facilities and supplies ■ Sport facilities and equipment ■ Scholarship for higher education ■ Livelihood/Vocational training ■ Project employment	Impacts associated with shadow flickers are assessed in ***Section 9.3.8*** of the ESIA report. This includes proposed mitigation measures. WTGs have been relocated to ensure distance from villages. The nearest WTG to the village is located more than 500 m from the village Impacts on surface water quality is assessed in ***Section 9.3.6*** of the ESIA report. This includes proposed mitigation measures. Impacts on air quality are assessed in ***Section 9.3.4*** of the ESIA report. This includes proposed mitigation measures. Shadow flicker impacts are assessed in ***Section 9.3.10*** and ***Section 9.5.7*** of the ESIA Report. This includes proposed mitigation measures. Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures. RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. CEGDP has been prepared to reflect community needs. Village heads will be informed prior to construction, this commitment is included in ***Section 10*** (ESMP) of the ESIA Report

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			Overall, the villagers are happy to support the Project is the Project provide satisfactory compensation and cater to the village needs. The Project should ensure compensation at market rates and compensation for booking land. In addition, the Project must consult and inform the villages prior to any activities.	
	09:00-12:00	Consultation with Prao Village **Location:** Prao Village **Participants:** Village heads and villagers of Prao, Seing A and Dak Kung Villages	■ The project has to inform the village head and villagers before construction to consider the location of camp in relation to cemetery location. ■ The ritual should be performed before the construction and objects to be prepared for the ritual are e.g., rice, water, sweets, etc. ■ Entry to the high elevation of Phou Koungking is not prohibited but it is difficult to access the top of Phou Koungking. Some villagers can access different elevations of Phou Koungking for NTFP. ■ Phou Koungking is the main area for NTFPs for Prao and Dak Kung villages **Main concerns include:** ■ Some people expressed their concerns about the water source due to road construction. ■ The Project must compensate for any impacts on land according to the laws ■ The villagers would like to know about the compensation unit rate and understand how the rates were determined **CDP Needs and priority** ■ The Project to provide support on village office ■ The Project to support on water supply (Nam Lin) ■ The Project to provide material support for village office ■ Request for 10 solar panels ■ The Project to build 1 school building for middle school ■ The Project to conduct detailed survey of Project impacts prior to construction	Impacts on surface water quality is assessed in ***Section 9.3.6*** of the ESIA report. This includes proposed mitigation measures. Village heads will be informed prior to construction, this commitment is included in ***Section 10*** (ESMP) of the ESIA Report Impacts to livelihoods and land use, including rice paddies, is included in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures. Land and economic displacement are assessed in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures. The Project will ensure all required processes for land acquisition are conducted in conjunction with relevant stakeholders. Impacts on surface water quality is assessed in ***Section 9.3.6*** of the ESIA report. This includes proposed mitigation measures. RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. CEGDP has been prepared to reflect community needs.

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			CDP Needs and priority (Dak Kung) ■ The Project to support on water supply (Nam Lin) ■ The Project to develop access road to the village ■ The Project to provide assistance with land tax payment ■ The Project to consider compensation for at least 3 years for impacted land ■ The Project to assist family without toilet ■ **CDP Needs and priority (Seing A)** ■ The Project to support on water supply (*Nam Lin*) ■ The Project to support on irrigation system ■ The Project to build/improve access road from Dak Lern and Seing A ■ The Project to provide scholarships to students and assist with employment opportunities	CHMP has been prepared in order to minimize impacts to cultural heritage resources Village heads will be informed prior to construction, this commitment is included in ***Section 10*** (ESMP) of the ESIA Report
	13:00-17:00	Consultation with Dak Terb Village **Location:** House of Dak Terb's village head **Participants:** Village heads and villagers of Dak Terb Village	■ The villagers have experienced land acquisition for existing TL; therefore, they are well aware of activities allowed and not allowed within TL ROW. ■ The villagers indicated that they have never been to Phou Koungking as it is located far away from the village. They usually collect NTFP in forest nearby the village. ■ One representative from the village participated in compensation unit rate consultation with the compensation committee. Some outstanding items of unit rate compensation include Agarwood and bamboo. **Main concerns include:** ■ Sedimentation may enter streams which the people are dependent on for drinking and domestic water sources as a result of Project activities. (Innogreen clarified that the Project will avoid construction activities during rainy season to minimize sedimentation and erosion impact to the water courses) **CDP Needs and priority:** ■ Households are quite poor, they do not have sufficient income	Impacts on surface water quality is assessed in ***Section 9.3.6*** of the ESIA report. This includes proposed mitigation measures. CEGDP has been prepared to reflect community needs.

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			■ Water supply and irrigation system e.g., Nam Lin ■ Some families have sufficient land but not sufficient labors to work on the land e.g., this young mother has a young child that she must tend to and therefore is not able to work on the land. The Project may provide support on livestock e.g., chickens and pigs to enable the mother to have additional income while taking care of the child at home	
	13:00-17:00	Dak Lern Survey and KIIs (Key Informant Interviews) **Location:** Dak Lern Village **Participants:** Village head/ assistant village heads	■ Most households in Dak Lern use timber and non- timber forest products (NTFPs) (mushroom, bamboo shoot, honey, ginseng, orchid, rattan, tiger grass etc.) from the hill of Phou Koung King. ■ Bamboo and tiger grass can be sold as a raw material or processesd as an added value product ■ Timber and non- timber forest products (NTFPs) collection is main income of household due to villagers collect and sell to merchant from Vietnam.	The information has been included in the RP as baseline of livelihood and income
Wednesday, 20 July 2022	09:00-12:00	Consultation with Dak Rant Village **Location:** Dak Rant School **Participants** Village heads and villagers of Dak Rant and Dak Dor villages	■ The majority of attendees have been fully vaccinated (mostly 3 doses) ■ Land acquisition for substation will affect active rice paddy and inactive rice paddy of 13 owners from Dak Bong and Dak Cheung villages. ■ Most people have rice paddy between 1.5 – 2 ha and average production is approximately 3 tons. ■ The villagers indicated that they have never been to Phou Koungking as it is located far away from the village. They usually collect NTFPs in forest nearby the village. To get permission to enter or construction activities in Phou Koungking, the Project must consult with Dak Lern and Prao villages. ■ In general, the villagers indicated they have no belief around Phou Koungking (refer that we need to ask Prao and Dak Lern villages). One elderly believed that Phou Koungking is the place of origin of Dak Cheung people. However, such belief was not shared by other village members.	Impacts on surface water quality is assessed in ***Section 9.3.6*** of the ESIA report. This includes proposed mitigation measures Impacts to livelihoods and land use, including rice paddies, is included in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures. Land and economic displacement are assessed in ***Section 9.5.3*** of the ESIA Report. This includes proposed mitigation measures. The Project will ensure all required processes for land acquisition are conducted in conjunction with relevant stakeholders. Noise impacts (including from turbines) are assessed in ***Section 9.3.7*** and

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			■ Representative from Dak Rant village participated in compensation unit rate consultation with compensation committee, while Dak Dor representative did not. The consultation discussed compensation unit rate for coffee and cassava. Outstanding items include communal land. ■ The villagers have not seen compensation unit rates prior to this consultation ■ Dak Dor village identified streams near WA131 and WA132 (Huay Nong and Huay Yerng) ■ Dak Rant village identified streams near WA048 and WA049 (Huay Rong) **Main concerns include:** ■ Sedimentation may enter streams which the people are dependent on for drinking and domestic water sources as a result of Project activities. (Innogreen: construction activities will be avoided during rainy season) ■ Concerns about agricultural land being affected from internal road e.g., materials or waste from Project vehicles fall on their crops ■ Noise and shadow flicker impact (Innogreen: clarified that impacts will be minor) ■ Traffic safety: the Project should inform the villages on number and timing of vehicles, notify the villages in advance of transportation activities, install traffic safety signs, speed limit, avoid transportation activities during peak hours where children are travelling to and from school, training/workshop for villagers on traffic safety. ■ Concerns related to influx: inform the village of number of workers, who and where they are from, where will their accommodation be. The village will develop Village Code of Conduct outlining what activities are allowed and what not in the village area. Moreover, the village also ask to review Project's worker Code of Conduct. The Project to install signs indicating no entry to sacred area in the village such as cemetery.	***Section 9.5.7***of the ESIA Report. This includes proposed mitigation measures. Impacts associated with shadow flickers are assessed in ***Section 9.3.8*** of the ESIA report. This includes proposed mitigation measures. WTGs have been relocated to ensure distance from villages. The nearest WTG to village is 500 m from the village Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures. Labour Management Plan have been prepared to include HR management that reflect local traditions of local employees RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. CEGDP has been prepared to reflect community needs. Village heads will be informed prior to construction, this commitment is included in ***Section 10*** (ESMP) of the ESIA Report Code of Conduct will be developed by the Project and provide opportunity for the village to review

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			■ During funeral or ceremonies, the villagers do not work and help each other preparing for such ceremony. The Project should ensure that local hired workforce is able to take a day off (with normal pay) for village ceremony and ensure that there will be no sanction for missing workdays due to village ceremonies. **CDP Needs and priority** ■ The Project should also provide access roads to agricultural land for the villagers ■ Vocational training for youth ■ Project employment (it was noted that there are youth in the village who graduated from college and engineering from university that will have the capacity to work for the Project) ■ Livestock raising e.g., pigs and chickens ■ Vegetable gardens (need budget and training on how to improve productivity and quality of vegetable garden) ■ Computer and desks for village office ■ Water supply and irrigation ■ Before the Project conduct any activities, it must consult with the villages ■ The Lenders recommended that CEGDP should include programs for implementation during Construction Phase which may include broader development projects e.g., improvement of water supply and health center. Currently the CEGDP is proposed to be implemented during Operation Phase which will start after 3 years. The communities will end up disappointed for not receiving any assistance within the 3 years of construction activities.	
	13:00-17:00	FGD (Focus Group Discussions) in Dak Lern Village Vice deputy, belief leader, other village representatives	**Access to Phou Koungking Mountain** ■ Phou Koungking Mountain, both high and low elevation areas, are not prohibited from access. The higher elevation portion of Phou Koungking Mountain is difficult to access because of difficult route and not many people	The information related to Phou Koungking and local belief and mitigation measures have been included in the CHMP and CEGDP.

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			know the way to access higher elevation portion of the mountain ■ Usually, people from Dak Lern village do not access the high elevation because they are afraid of poisonous animals such as snakes. ■ Only the Belief Leader ("Tao Kae Naew Home" which is translable as an elderly who can/have the power to gather/assemble all villagers together or spiritual center of all villagers) identified to frequently access to the top of the mountain, where village boarder between Prao and Dak Lern lies, in order to monitor NTFP collection. **Belief Around Phou Koungking Mountain** ■ The FGD suggested that people are not afraid of entering high elevation area because of spirits, but rather poisonous animals such as snake ■ The FGD indicated that the belief in spirit such as 'Phi Bang Bot' is not strong nor common within villagers as it has been a long time since someone encountered spirits and there has been no evidence to prove. ■ The people, however, belief that when entering the forest/mountain, Heet (long inherited traditions) and Kong (social norm, custom or guidelines) must be followed1. For instance, an offering must be performed prior to entering the forest for NTFP Collection. ■ Sacredness of Phou Koungking Mountain ■ It is noted that Phou Koungking Mountain is not regarded as a 'sacred' place (considered holy and deserving respect/worship). Cemetery, on the other hand, is considered a highly sacred place by the villagers. If the Project impacts cemetery, a higher level of ritual is required. Such ritual involves sacrificing of a puppy and use its blood to spread across affected cemetery area. **Permission to Access Phou Koungking Mountain** ■ Different rituals are required prior to entering the mountain based on the purposes. The Project must consult with Prao and Dak Lern Villages and comply with the village requirements.	

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			■ For NTFP Collection, 6 grain of rice, tobacco and incense are required to be offered under a large tree in the forest ■ For Project construction activities, the project is required to provide budget for the village to perform ritual. The ritual involves a pig, a jar of rice whisky and a copper bracelet. A pig will be sacrificed while the blood is flowing over the copper bracelet, it is highlighted that everyone in the village must touch the blood of the big. Thereafter, the pig will be cooked, and all villagers must eat the pork and drink rice whisky from the jar. The copper bracelet will be left there where the ritual is performed. The ritual is usually performed in the village in the evening. It is noted that by performing this ritual, it covers asking for permission from all spirits that the people believe in including village spirit, forest spirit, mountain spirits, etc. ■ The people believe that if the rituals are not carried out correctly, it will result in illness and depression of people in the village. However, such mistake in the rituals can be repaired/amended by correcting the exact step that went wrong. **Belief Leader** ■ Belief leader in the village is known as “Tao Kae Naew Home” which means an elderly who can/have the power to gather/assemble all villagers together. Tao Kae Naew Home is usually someone who are well educated of Heet-Kong and have extensive experience in performing rituals that can guide the villagers. **Cemetery/Spirit/Sacred in Triang’s Belief (KII with village coordinator from Dak Tiem Village)** ■ Environmental spirits are spirit that are naturally there e.g., forest spirit, river spirit and mountain spirit, etc. This is different from spirits in the cemeteries which are spirits of the dead. Belief in environmental spirits is subjective and differs per village and individuals—usually people would follow the belief leaders of their villages. ■ The interviewee regarded cemetery as a highly sacred place as their parent who passed away are resting there. Activities to disturb resting of their ancestors such as	

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			chopping of wood or loud noise are prohibited—he feared if his parent are woken up from their resting by disturbing activities, the parent spirits will be angry at him for not protecting them and let them rest in peace after death. ■ Phi Bang Bot (literal translation as cover the eyes) is a ghost that has the power to blind people. There has been no evidence of people encounter such spirit/ghost, but rather when someone got lost in a forest, they would likely blame it on Phi Bang Bot for blinding their eyes and causing them to get lost in the forest.	
21 July 2022	09:00-12:00	Consultation with Dak Cheung, Ngon Don, and Dak Muan Villages **Participants** Village heads and villagers of Dak Cheung, Ngon Don, and Dak Muan Villages	**Villager Concerns** ■ If the road cuts off all of the land that they own. ■ Safety of the transport vehicle. ■ There is risk of spreading COVID/other diseases from the workers to the villagers. **Villager Suggestions** ■ Inform village head on date of transportation ■ Have set times on when the transport vehicles can pass through school areas. ■ Teaching techniques for better efficiency in agriculture (mainly coffee) ■ Fertiliser for the village, soil is not fertile. ■ Equipment for village office ■ Train young people in electricity to provide jobs ■ Training in tailoring for women to create jobs ■ Create a landfill for disposing of waste ■ Development of farming areas for villagers in need ■ A safety inspection to prevent the spread of any contagious diseases from the workers. ■ Management of waste by the workers **Other Information** ■ Villagers like the idea of having a road next to their land for easier access.	Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures. CEGDP has been prepared to reflect community needs.

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			■ Some villagers bring their own water to their farms/garden, some rely on water sources nearby. ■ Each village has their own foraging grounds, do not usually forage in other villages' territory	
21 July 2022	13:00-16:00	Consultation with Dak Bong, Dak Pum and Dak Seing A **Participants** Village heads and villagers of Dak Bong, Dak Pum and Dak Seing A Villages	**Villager Concerns** ■ Compensation unit rates are low compared to the market value (for some crops) ■ Will the organization pay the compensation cash themselves or will a third party (government official) do it. **Villager Suggestions** ■ Education equipment (for teaching and learning). ■ Coffee trees and cows (Bringing animals and coffee saplings). ■ Create an area for farming for the villagers (using villagers' existing land). ■ Compensate people and families before any development. ■ Respect village traditions and comply with them before development. ■ If project fails to comply with village demand, the project will not move forward. ■ Transmission lines over the cemetery requires cash paid upfront as compensation given to the village in order to fix any damages (trees cut to reduce height) ■ Improvement in clothes, village office	RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. CEGDP has been prepared to reflect community needs CHMP have been prepared to address impacts to cultural heritage and proposed appropriate mitigation measures.

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
22 July 2022	09:00 -12:00	Consultation with Dak Nong, Dak Samor and Sak Yok Villages **Participants** Village heads and villagers of Dak Nong, Dak Samor and Sak Yok Villages	**Villager Concerns** ■ Noise caused from the wind turbine **Villager Suggestions** ■ Create a source of water from nearby lakes. ■ Fix roads, some parts cannot be crossed during rainy season, road is cut off. ■ Villagers want animals (cows, buffalos, chickens, etc). ■ Medicine and other health facilities. ■ Waste issue, landfill area for village. ■ Toilet facilities for better hygiene. **Other Information** ■ Villagers use nearby water sources when at their farms (Huai Sek, Huai Peep) ■ All three villages participated in the unit rate compensation.	Noise impacts (including from turbines) are assessed in ***Section 9.3.7*** and ***Section 9.5.7***of the ESIA Report. This includes proposed mitigation measures. Impacts on surface water quality is assessed in ***Section 9.3.6*** of the ESIA report. This includes proposed mitigation measures. RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. CEGDP has been prepared to reflect community needs
9 Sept 2022	9:30-11:30	Consultation with Dak Yang Village Location: Dak Yang Village Primary School	**Villager Concerns:** ■ Safety concern over the transportation of materials, particularly for children. The Project should notify the village on transportation activities and implement speed limit. ■ Vibration of WTGs during operation may reach their house **Villager Suggestions** ■ Assistance on the agricultural coffee cultivation equipment, such as: hoes, shovels, barbed wires for constructing fences, coffee seedlings, fertilizers, bio-fertilizers for cultivating coffee. ■ Assistance on the vocational skills for women, which is: tailoring work in order to generate additional income ■ Provision of eduction facilities and equipment ■ Clear the paddy field land area, agricultural land ■ Pioneer and improve the livelihood e.g., dry season rice fields and gardens of the people of the village ■ Improve/construct an irrigation into agriculture	Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures. Noise and Vibration Management Plan will be developed. RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. CEGDP has been prepared to reflect community needs

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			■ Assitance with water supply system ■ Supply toilet construction equipment (mortar, zinc-tiles, briccls) and toilet (squat toilets). ■ **Other information:** ■ The village representatives participated in consultation on compensation unit rate with governmental authorities	
9 Sept 2022	14:00-15:30	Consultation with Trong Mueang Village Location: Dak Yoi Primary School	**Villager Concerns:** ■ Safety concern over the transportation of materials, particularly for children and livestock. In order to solve the concerns about this issue, the project shall practice as follow: - Notify the village 1 week in advance, as well as the period of arrival, which time, what will be transported in order for the people to intercept, determine the boundaries for livestock and children, fearing that children may want to observe the large transportation causing it to be dangerous. - Implement a speed limit. - Implement a guidance car in front and behind the transportation. - If possible, would like the transportation to be at night/weekends, not to be during school time. ■ The villagers reported water shortage issue during dry season **Villager Suggestions** ■ Assist the village with domestic and drinking water ■ Assistance regarding the toilet construction equipment and materials: mortar, zinc-roof tiles, bricks, squat toilet, toilet ■ The land of the affected person that is an abandoned garden land that have the correct land title/documents to be fully compensate 100%. ■ Promote the education for the people in the village to study and improve and construct a school for the village. **Other information:**	Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures. Traffiic Management Plan will be developed and implemented. Impacts on surface water quality is assessed in ***Section 9.3.6*** of the ESIA report. This includes proposed mitigation measures. RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. CEGDP has been prepared to reflect community needs

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			■ The village representatives did not participate in consultation on compensation unit rate with governmental authorities	
10 Sept 2022	10:20-12:20	Consultation with Dak Den Village	**Villager Concerns:** ■ Loss of forest areas and associated use of the forests ■ Concerns on safety during strong wind which may cause the WTGs to spin at a high rates. The Project representative clarifidef that the WTGs will have in place automatic bake in otder to contron the speed of the blade, therefore, the WTGs spin rate will not exceed the safety limit. ■ Some people feel unappy that land without tax payment receipt will not receive compensation ■ The Project should avoid impact to cemetery areas ■ Yar stream is used by the villagers and located nearby the WTGs ■ The village representative participated in the compensation unit cost consultation with relevant overnment authorities; however, to date they still do not know the determined price ■ Safety concern over the transportation of materials, particularly for children. The Project should notify the village on transportation activities and implement speed limit. **Village Suugestions:** ■ The Project should also provide assistance for access roads to rice fields and planatations ■ Gravity-fed water system is inconvenient, the Project should provide assistance ■ The Project should provide assistance in supplying equipment for toilets ■ According to the plan, the previous field survey does not reach some certain points, resulting in some certain individuals or parts to be incomplete. Would like the team to additionally notify the project owner.	Biodiversity impact assessment is conducted in ***Section 9.4.3*** and mitigation measures are provided. Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. Grievance mechanism for community has been established. The Project design avoids impact to all cemeteries. Impacts on surface water quality is assessed in ***Section 9.3.6*** of the ESIA report. This includes proposed mitigation measures Traffic Management Plan will be developed and implemented CEGDP has been prepared to reflect community needs

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			■ The previous data on the affected person was not cleared. Currently, the data is now clear. Would like the team to additionally notify regarding the compensation value for each person and would like to additionally notify the people. ■ The Project should ensure the compensation is paid appropriately according to the plan and annoucement. ■ The Project should ensure that plans and programs proposed in the LRP and CEGDP are implemented ■ The Project to provide equipment for agriculture such as hoe, shovel, tractor, etc. ■ Would like assistance regarding the cultivation technique (coffee cultivation), agricultural techniques, as currently, animals are raised as they are born	
11 Sept 2022	9:00-11:00	Consultation with Nonsavan Village Location: House of Nonsavan Village Head	**Villager Concerns:** ■ In the past, there have been inconsistency in impact assessment and the actual impacts. Therefore, the Project to re-inspect to prevent this incident. ■ Safety concern over the transportation of materials. Concern that roads may be damaged due to heavy vehicles and suggested the Project to have separate road for transportation to avoid village roads if possible. **Village Suugestions:** ■ Training on animal husbandry for the people and agriculture as the soil in Dak Cheung area is not fertile, resulting in not knowing what to do or what to cultivate. ■ Provide vocational skills training to the women, such as: tailoring work as the women do not have much knowledge **Other Information** ■ The village participated in compensation unit rate consultation with relevant authorities ■ Some villagers collect mushroom in Phou Koungking Mountain area. . There is a belief, as in the previous year, there are stories that someone disappeared during NTFP collection and rituals must be conducted for he/she to come out of the mountain.	Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures Traffic Management Plan will be developed and implemented RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. CEGDP has been prepared to reflect community needs

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
11 Sept 2022	-	Consultaiton with Dak Pum Village Location: Dak Pum Village Primary School	**Villager Concerns:** ■ Safety concern over the transportation of materials. **Village Suugestions:** ■ Construct a new village office ■ Supply barbed wires, fence construction equipment ■ Providing training on agriculture and weaving to the people ■ Supply livestock, such as: duck, chicken, goat, cow, buffalo to the people, so that they can raise and sell to generate income for the family ■ Supply coffee seedlings to the people ■ Solve drinking water and domestic water issue ■ The Project to supply materials for toilets whilst the villagers can carry out construction work **Other Information** ■ None of the villages have accessed to Phou Koungking Mountain as the area is disscult to enter ■ The village did not participate in compensation unit rate consultation with relevant authorities	Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures Traffic Management Plan will be developed and implemented RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. CEGDP has been prepared to reflect community needs
11 Sept 2022	9:30-11:30	Consultation with Dak Learn and Tong Xieng Villages Location: Dak Lern Kindergarten-Primary School	**Village Concerns:** ■ Concerned that it may be dangerous to the people, especially children and livestock of the people. Would like the project to strictly abide the traffic regulations, would like there to be a speed limit and notify the village before the transportation enter the village ■ Concened that they may trespassing into the forbidden forest or the foraging area of the people. Therefore, would like there to be a regulation for labors, ■ Concern regarding diseases from outside, such as: Covid-19, ■ Concern that there may be drugs use/sell in the village **Village Suugestions (Tong Xieng Village):**	Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures Traffic Management Plan will be developed and implemented A Worker Code of Conduct (governing no-go zones and prohibits drug use) will be developed by the Project and provide opportunity for the village to review Community Health and Safety Plan and Occupational Health and Safety Plan will be developed

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			■ Assist the poor families, as previously the poor families' houses caught in a fire, therefore, would like the project to assist them. ■ Provide training on agriculture to the people ■ Provide training on tailoring to women and tailoring equipment to them ■ Assistance regarding the gravity-pull/spring water for household consumption as currently there is a shortage of water ■ Assistance regarding the healthcare, which is: toilet, bathroom construction equipment ■ Level the paddy field land for the people or supply tractor to the people ■ Coordinate with the village prior to any works in order not to cross the custom of the village ■ Construct the teacher's office for the school of the village. ■ Supply livestock to the people, such as: chicken, duck, pig, goat, cow, buffalo, etc. **Village Suugestions (Dak Lern Village):** ■ Repair the road accessing the village and road accessing to the dry season rice fields, gardens and paddy fields of the people ■ Clear and level the paddy field land of the people ■ Assistance on the drinking water ■ The Project to prioritize local labor as the village labor would like to work with the project ■ Provide technical training on agriculture to the people ■ The Project to comply with the custom and traditions of the village if the Project work will be undertaken in the village area, especially Kung King Mountain area. **Other Information** ■ The village did not participate in compensation unit rate consultation with relevant authorities	RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. CEGDP has been prepared to reflect community needs

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
12 Sept 2022	14:00-16:00	Consultation with Dak Jom Village Location: House of Dak Jom Village Head	**Villager Concerns:** ■ Concerns on employment but payment was not received (as experienced in previous projects) ■ Safety concern over the transportation of materials, particularly for children. The Project should notify the village on transportation activities and implement speed limit. **Village Suugestions:** ■ Assistance regarding heath care or supply toilet materials: for toilets. ■ Provide a training regarding textiles weaving, modern cloths weaving. ■ Assistance in constructing a new village office. ■ The Project to comply with custom and traditions for management land of the village before construction ■ The Project to help improve water supply system ■ Provide electricity to families that still lack electricity ■ The Project to level and clear the paddy field land in order for the people to farm. ■ Assistance with irrigation system to the paddy field ■ Provide training on agriculture and equipment such as: mower, seedlings, etc. ■ Improve the road conditions ■ Improve healthcare facilitites including nurse and medicine ■ Provide teachers to the school and improve education facilities **Other information:** ■ The village representatives participated in consultation on compensation unit rate with governmental authorities ■ There are water resources in the village but not located near construction area	RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures Traffic Management Plan will be developed and implemented CEGDP has been prepared to reflect community needs

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
13 Sept 2022	9:20-11:30	Consultation with Dak Ta-ok Noi Village Location: Dak Ta-ok Noi Village Primary School	**Villager Concerns:** ■ Safety concern over the transportation of materials, particularly for children. The Project should notify the village on transportation activities and implement speed limit **Village Suugestions:** ■ Assistance with insufficient rice for consumption ■ Assistance regarding the equipment, pipes that can irrigate the paddy field. ■ The project to supply toilet construction equipment, such as: squat toilets, stone ore, mortar, block ■ Provide training on tailoring, modern textiles weaving to women ■ The Project to repair the road accessing the village to be and place a drainage pipe to avoid flooding of the road ■ The Project to give priority to hiring local labors of the village ■ Construct a dispensary and have a village doctor ■ The Project to supply telephone signal station, as there are no signal in the area, causing difficulty in work coordination **Other Information** ■ The village did not participate in compensation unit rate consultation with relevant authorities ■ There are Xe Kaman river and Dak Yae stream. However, Dak Yae stream is not used and Xe Kaman river flow is too turbulent to be used	Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures Traffic Management Plan will be developed and implemented RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. CEGDP has been prepared to reflect community needs

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
13 Sept 2022	13:00-14:30	Consultation with Dak Dom Village	**Villager Concerns:** ■ Safety concern over the transportation of materials, particularly for children. The Project should notify the village on transportation activities and implement speed limit. **Village Suggestion:** ■ Construct access road to the village ■ Provide assistance on electricity in the village ■ Provide village dispensary ■ Supply bathroom and toilet construction equipment ■ Provide vocational skills training in order to generate more income for the village, such as: textile weaving, silk weaving, agriculture ■ The Project should also provide assistance for access roads to rice fields and planatations ■ Assistance on irrigation system ■ Supply textile weaving/pressing machines, wires ■ Provide more teachers and education facilities. ■ Would like a gravitational-pull/spring water as a water use in the household as there are none during dry period ■ Would like barbed wires and meshes for garden, sunscreen for coffee trees, and rubber cloth for indoor gardens (indoor cultivation) ■ The Project should provide employment opportunities and prioritize local labors which are young people in the village. **Other information:** ■ The village representatives participated in consultation on compensation unit rate with governmental authorities ■ There are no water resources in the village	Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures Traffic Management Plan will be developed and implemented RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. CEGDP has been prepared to reflect community needs
15 Sept 2022	-	Consultation with Dak Padou Village	**Villager Concerns:** ■ There is Dak Ju stream and Nam Yard stream that is near the project area	Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
		Location: House of Dak Padou Village Head	■ No concerns regarding labours if they reside in provided workers' camp ■ Safety concern over the transportation of materials, particularly for children. The Project should notify the village on transportation activities and implement speed limit. Also concern on dust associated with transport activities. ■ There are about more than 20 families still do not have electricity. They need to depend on other families, and then share the electricity bills. **Village Suggestion:** ■ The project to construct road accessing the village and the road to Sanxay-Trong Muang. ■ The project to allocate the village lands as the village lands are narrow and tightly packed, causing the new families to not have land to construct a house ■ Construct a new village office ■ Construct a dispensary for the village ■ Assist the village in solving the gravity-pull/spring water issue ■ Supply motorbike to the village to serve administration works ■ Supply squat toilet ■ Construct a school inclusive of a nursery level and provision of teachers ■ Provide assistance about the sport equipment to the village, such as: volleyball, football, basketball…. ■ The project to give priority to the labour of the village ■ Provide vocational skills training for the people. **Other information:** ■ Mostly collected at Kong Lu Mountain, the products collected are: flower pattern mushroom (Dok Laiy), forest ginseng, orchid, cobra head mushroom (small LinJue)	Traffic Management Plan will be developed and implemented RP and Livelihood restoration plan have been prepared to minimize impacts to affected people from Project land acquisition. CEGDP has been prepared to reflect community needs

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
15 Sept 2022	14:00-15:40	Consultation with Nam Ngon Neau Village Location: Nam Ngon Neau Village Meeting Room	**Villager Concerns:** ■ Safety concern over the transportation of materials, particularly for children and livestock and loud noise. ■ If there is a construction in Kong Lu Mountain, it may affect the livelihood area of the people, but still does not know the precise location. **Village Suggestion:** ■ Improve the road from Sanxay district to the village area ■ Provide assistance regarding the food supply to families with insufficient food ■ Assitance in solving water shortage issue, particularty during April-May ■ Improve healthcare facilities including having a doctor available and sufficient medicine and equipment for treatment ■ Provide electricity for households without electricity **Other information:** ■ There is a stream flowing down from Kong Lu Mountain that is use for drinking when going to the forest. There is Yoon stream. In the village area, gravity-pull/spring water is used.	Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures Traffic Management Plan will be developed and implemented Impacts on surface water quality is assessed in ***Section 9.3.6*** of the ESIA report. This includes proposed mitigation measures CEGDP has been prepared to reflect community needs
16 Sept 2022	10:20-12:00	Consultation with Dak Dor, Dak Xied and Dak Zuem village Location: Dak Xied Village School **Participants** Village heads and villagers of Dak Dor, Dak Xied and Dak Zuem village	**Villager Concerns:** ■ Safety concern over the transportation of materials, particularly for children. The Project should notify the village on transportation activities and implement speed limit and no transport activity after 8 pm as it will disturb rest time of villagers. ■ Covid-19 vaccines should be provided to all workers and villagers ■ Food insufficiency in some years **Village Suggestion (Dak Xuem):** ■ Construct access road (asphakt) to the village	Community Health and safety impacts are assessed in ***Section 9.5.4*** of the ESIA report. This includes proposed mitigation measures Traffic Management Plan will be developed and implemented Occupational Health and Safety Plan and Local Content and Influc Management Plan will be developed Impacts on surface water quality is assessed in ***Section 9.3.6*** of the ESIA

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			■ Assistance in connecting gravitational-pull/spring water pipes to each house. ■ Provide assistance to poor families, such as: families with a female family head, lack food, orphan's families, families that lack electricity, lack clothing. ■ Provide clothing to the people. ■ Construct a village dispensary ■ Construct a sport field and sport equipment, such as: football, volleyball, Sepak Trakaw ■ Training for women, such as: textiles weaving and assist to train women to have the knowledge, skills and promote the development of women, such as: agricultural business. ■ Clear the paddy field land area for the people ■ Assistance in adjusting the village area in order to be able to construct a new house. ■ Provide livestock: duck, chicken, buffalo, pig ■ Provide assistance on food sufficiency by supplying rice ■ Provide funding to the village and motorbike to each village head **Village Suggestion (Dak Dor):** ■ Repair the road accessing the village, Nam Ang falls and Nam ang bridge. ■ Construct a permanent school and provide educational equipment ■ Provide the local labors with employment opportunity ■ Supply the toilet construction materials, such as: stone ore, mortar, squat toilet, etc ■ Assistance in installing electricity in the village ■ Assistance in solving the water shortage in the village **Village Suggestion (Dak Xied):** ■ Supply toilet construction materials to the people	report. This includes proposed mitigation measures CEGDP has been prepared to reflect community needs

Date	Time	Action/Location/Participants	Key Findings/Summary	How issues or concern was addressed in Project Design or E&S Documents
			■ Supply construction materials for village office ■ Supply livestock to the village: small animals (chicken, duck), large animals (cow, buffalo) ■ Provide assistance to poor families that lack food, housing ■ Construct a road from Salermxay to Dak Dor, Dak Xied, Xieng Luang village and avoid the cemetery area. ■ Clear/pioneer the road accessing the dry season rice field and garden land of the people. ■ Pioneer in constructing the terrace rice field for the people ■ Assistance in healthcare facilitites and treatment ■ Assistance with the kitchen equipment of the village women's union, in order to cook for the students and guests of the village **Other information:** ■ The village representatives participated in consultation on compensation unit rate with governmental authorities ■ The villagers collect NTFPs in forest area around the village, mostly collect vegetable, DokLai mushroom (flower/pattern mushroom), Tome fruit, cardamom, Khaem fruit ■ Shortage of water during dry season is reported ■ There is Ban strean located near WTGs. This stream is used for bathing, and as a gravitational/spring water.	

8 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS

8.1 Introduction

This chapter summarizes the existing physical (***Section 8.3***), biological (***Section 8.4***) and social (***Section 8.5***) conditions in the Area of Influence (AOI), focusing on the resources/receptors that may be impacted by the Project. Information in this chapter is based on studies undertaken by the local EIA (Innogreen & Greener Consultant, 2020), a desktop review of publicly available information, and the additional noise, landscape and visual, biodiversity, and social baseline studies undertaken in 2021 to 2022 by Innogreen, with ERM's guidance, during preparation of this ESIA.

8.2 Defining the Study Limits

8.2.1 Project Area

The Project area refers to the land that is used for Project facilities and activities across all project phases. This includes land being used on both a permanent and temporary basis. The full description of Project facilities and activities is presented in ***Section 4.3***, ***Section 4.9***, and summarised in ***Figure 8-1***. This includes the wind farm site boundary, the 22 km transmission line, and the access roads within the wind farm site boundary.

8.2.2 Area of Influence

Under the ADB SPS, the Area of Influence (AoI) encompasses:

"*(i) the primary project site(s) and related facilities that the borrower/client (including its contractors) develops or controls, such as power transmission corridors, pipelines, canals, tunnels, access roads, borrow pits and disposal areas, and construction camps;*

(ii) associated facilities that are not funded as part of the project (funding may be provided separately by the borrower/client or by third parties), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project;

(iii) areas and communities potentially affected by cumulative impacts from further planned development of the project, other sources of similar impacts in the geographical area, any existing project or condition, and other project-related developments that are realistically defined at the time the assessment is undertaken;

(iv) areas and communities potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location."

This Project's AoI includes the following:

- The wind farm area (concession area), internal access roads, and transmission line route to the Vietnam border;
- The distribution of potential sensitive shadow flicker receptors within 2 km from any wind turbine, i.e. i.e. 12 clusters consisting of a variable number of properties/buildings (from 7 to 140) across seven villages, based on a desktop analysis of local settings, and preliminary modelling of shadow flicker to understand potential receptor distribution in the vicinity of the wind turbines. The shadow analysis was conducted without define a radius of influence (such for example the most widely adopted standard Clarke's (1991) approach of setting 10 times the rotor diameter) so as not to exclude the occurrence of flickering shadows beyond the defined area;

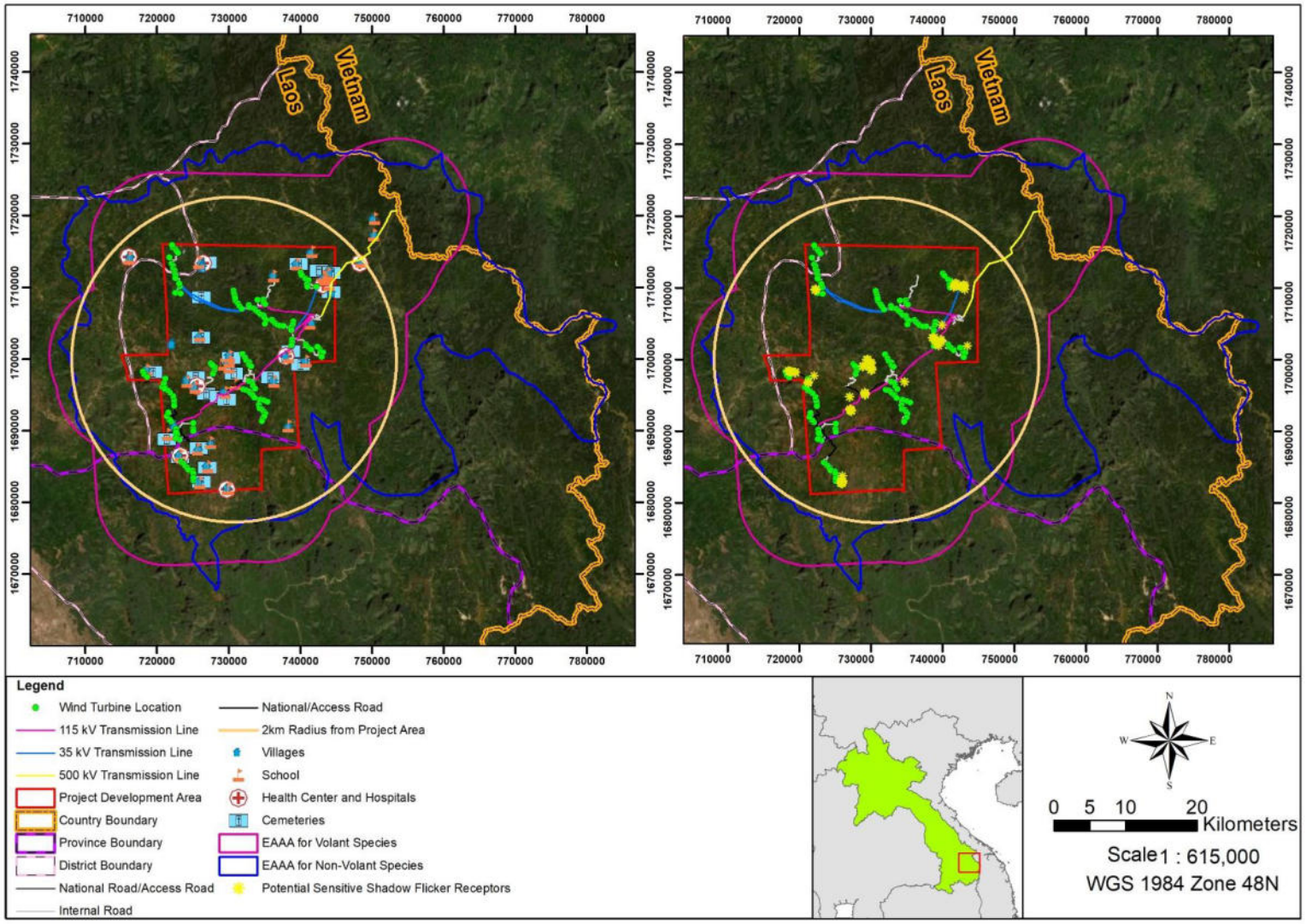
- The distribution of potential sensitive noise receptors within 2 km from any wind turbine, which has been selected based on good practice considerations[32];
- 23 villages in Dak Cheung district of Sekong province, and 8 villages in Sanxay district of Attapeu province affected by permanent land acquisition, permanent land use restrictions, temporary access agreements, and/or impacts to livelihoods and community health, safety and security;
- The administrative boundaries of Dak Cheung and Sanxay districts as representative of all areas that could be indirectly affected by changes in ecosystem services, community health, or linked to by local cultural heritage; and
- The Ecologically Appropriate Area of Analyses (EAAAs) which were delineated to account for species and/or ecosystems that regularly occur in the general area that may be affected by the Project. Two EAAAs were identified for volant (flying) species, and non-volant (non-flying) species, respectively. The approach taken to delineate the EAAA boundaries is presented in Section ***2*** of ***Appendix S***. The Project's AoI is presented in ***Figure 8-1***.

8.2.3 Study Area

The study area is defined to ensure that the baseline is adequately characterised to facilitate understanding of the potential interactions between the Project and resources/receptors within the AoI. The Project's study area encompasses both the Project area and AoI as described in ***Section 8.2.1*** and ***Section 8.2.2***, and are clearly defined for each resource/receptor in subsequent sections, ***Section 8.3***, ***Section 8.4*** and ***Section 8.5.***

[32] Information provided in guidelines such as the World Bank Group's Environmental, Health and Safety (EHS) Guidelines for Wind Energy (IFC, 2015) was considered when delineating the Project's AoI.

Figure 8-1: The Project's Area of Influence (AoI)



8.3 Physical Environment Baseline

8.3.1 Introduction

This section provides an overview of the physical environment baseline conditions within the Project Study Area, including topography, geology and soil, climate and meteorology, air quality, noise, surface water quality, land cover, landscape values and visual amenity, and natural hazards.

Some information in this section is from baseline studies undertaken in 2021 by Innogreen, including noise (***Appendix B***), surface water (***Appendix C***), landscape values, and visual amenity (***Appendix D***).

Other information is based on studies undertaken from the local EIA, and published and publicly available information, including topography, geology and soil, climate and meteorology, air quality, wind speed monitoring, and natural hazards.

8.3.2 Topography

The Project is located in Dak Cheung District of Sekong Province and Sanxay District of Attapeu Province. Dak Cheung District is located in the eastern side of Sekong Province and has a total area of 2,732 km^2 (34.64% of the total provincial area), with the average elevation of approximately 1,200 m above sea level (the lowest point is 529 m and the highest point is 1,397 m above the sea level). Dak Cheung District is adjacent to Kaleum District in the north, Sanxay District of Attapeu Province in the south, Tai Yang and Nam Yang of Quang Nam Province and Dak Lai of Kon Tum Province of Vietnam in the east and, Lamarm District of Sekong Province in the west.

Generally, the topography comprises hills and high steep mountains (high mountainous area covers 95% and hill area covers 5%). The hills and mountains have complex features that are separated by numerous rivers and streams.

Sanxay District is located in the eastern side of Attapeu Province and has a total land area of 3.648 km^2. Sanxay District is adjacent to Dak Cheung District and Lamarm District of Sekong Province in the north, Phouvong District in the south, Dak Lai, Kon Tum Province of Vietnam in the east, and Saysettha District in the west. Sanxay District is divided into two types of areas, with 5% consisting of plain areas and 95% with high mountain areas. The elevation in this District ranges from 200 m to 1,600 m above sea level and has approximately 50% forest coverage of the total area.

The Project Area is mostly on the slopes of hills and high mountainous area, the elevation ranges from about 1,000 – 1,200 m above sea level (***Figure 8-2***).

Figure 8-2: Topography of the Project Area

8.3.3 Geology and Soil

According to the soil survey result and classification of agricultural and forest areas in Dak Cheung District, Sekong Province (2020), six soil groups and nine types of soil based on the original rocks, condition of the location, identified layer, and identified characteristics of the soils that is described as follows:

- The area is primarily composed of heavy clay, clay loam, and loamy sand.
- The depth of the soil layer is mostly comprised of very deep soil layer (D) > 100 cm from the soil surface, the moderately deep soil layer (M) between 75-100 cm, shallow soil layer (S) between 30-50 cm, and thin soil layer (T) between 50-75 cm from the soil surface.

Soil in Sanxay District of Attapeu Province is divided into six soil groups that is classified into 13 types of soil based on the original rocks, condition of the location, identified layer, and identified characteristics of the soils that is described as follows:

- The soil areas are primarily composed of clay loam, hard clay and loamy sand.
- The depth of the soil layer is mostly comprised of very deep soil layer (D) > 100 cm from the soil surface; next is the shallow soil layer between 30 and 50 cm and the smallest is the thin soil layer between 50 and 75 cm from the soil surface.

It is noted that soil sampling was not undertaken as part of the baseline because no significant soil impacts from Project activities were expected; however, soil monitoring is required to be conducted prior to construction commencement for the POPs (refer to ***Section 9.3.3*** and ***Section 10.8*** for pre-construction soil monitoring requirements).Climate and Meteorology

The weather condition of Dak Cheung District and Sanxay District is mostly cold and with light drizzling rain over almost the entire year. The rainy season is between March and July, whereas the dry season runs from August to October. Over the past five years, a slight change in the temperature has been observed, with an increase of about 1-2 degrees Celsius (EIA, 2020).

8.3.3.1 Temperature

Based on meteorological data from Meteorology Station of Dak Cheung District – the nearest station to the Project, the average annual temperature in 2015 – 2019 is between 20.1 and 21.3 °C (***Table 8-1***). The maximum average temperature was 25.6°C in October 2016, and the minimum average temperature is 14.1 °C in January 2015. Dak Cheung District is situated in high mountain area and is influenced by the monsoon winds. This results in high water vapour and humidity.

Table 8-1: Average Temperature from the Meteorology Station

Year/Month	Average Temperature (°C)												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Average**
2015	14.1	17.3	20.9	22.6	23.5	22.8	21.3	22.8	22.4	21.1	20.1	18.7	20.6
2016	18.6	16.5	20.6	24.0	23.1	22.8	22.4	22.5	22.7	25.6	19.9	16.6	21.3
2017	17.5	17.4	20.4	22.3	22.7	23.0	21.6	22.8	23.1	20.4	18.7	15.9	20.5
2018	16.7	16.8	19.1	21.4	22.7	22.0	21.3	21.1	22.7	20.1	19.8	18	20.1
2019	16.8	20.9	22.7	23.6	23.5	23.9	22.3	21.6	21.3	20.9	18.3	16.1	21.0
Min	**14.1**	**16.5**	**19.1**	**21.4**	**22.7**	**22.0**	**21.3**	**21.1**	**21.3**	**20.1**	**18.3**	**15.9**	**20.1**
Max	**18.6**	**20.9**	**22.7**	**24.0**	**23.5**	**23.9**	**22.4**	**22.8**	**23.1**	**25.6**	**20.1**	**18.7**	**21.3**

Source: Meteorology Station of Dak Cheung District

8.3.3.2 Rainfall

Based on rainfall data from the Meteorology Station of Dak Cheung District, the nearest station to the Project, the total annual rainfall from 2015-2019 ranged from 1,135-1,796 mm (***Table 8-2***).The maximum annual rainfall was 1,796 mm (in 2018) and the minimum annual rainfall was 1,135 mm (in 2015). The maximum rainfall recorded was 371.6 mm in September 2019. The minimum annual rainfall was 0 mm in March 2016 and February 2019. The months with the heaviest precipitation in 2015-2019 are May to November.

Table 8-2: Annual Rainfall from the Meteorology Station

Year/Month	Annual Rainfall (mm)												
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total**
2015	17.2	45.5	34.8	110.8	70.9	219.4	156.4	139.2	170.9	88.5	74.3	6.8	1,135
2016	31.1	1.5	0	64.1	241.7	191.1	226.6	173.6	320.6	174.9	196	117.5	1,739
2017	53.4	29.7	40.3	62.8	160	83.2	296.5	71.8	120.9	200.3	306.1	64.4	1,489
2018	44	19.8	140.4	155.7	253	166.7	291.1	284.7	263.4	63.1	32.1	81.9	1,796

Year/Month	Annual Rainfall (mm)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2019	30.3	0	57.9	142.8	275.2	128.2	140.4	361.4	371.6	110.9	89.5	14.1	1,722
Min	**17.2**	**0**	**0**	**62.8**	**70.9**	**83.2**	**140.4**	**71.8**	**120.9**	**63.1**	**32.1**	**6.8**	**1,135**
Max	**53.4**	**45.5**	**140.4**	**155.7**	**275.2**	**219.4**	**296.5**	**361.4**	**371.6**	**200.3**	**306.1**	**117.5**	**1,796**

Source: Meteorology Station of Dak Cheung District

8.3.3.3 Humidity

The Project is located in a mountainous area that is covered mostly with forests. The weather condition is influenced by tropical winds from Vietnam that result in high humidity during the morning and cloud cover during the evening, along with evaporation along the mountain ridges.

8.3.3.4 Wind Speed

Wind speed was measured by IEAD between 2012 and 2021. Wind measurement masts with a length of 110 m were installed and the data was recorded using Second Wind Nomad 2, Wind Sensor P2546A, and Vector w200P. The monthly wind speed and direction are shown in ***Table 8-3***. The average wind speed for 2012-2021 was 6.474 m/s, the maximum average wind speed was 11.069 m/s; recorded in December, and the minimum average wind speed was 4.099 m/s; recorded in May.

Table 8-3: Average Wind Speed Measurement in the Project Area for 2012-2019

Months	Wind speed at 110 m (m/s)	Direction (degree)
January	8.458	62.7
February	7.760	61.7
March	5.907	70.5
April	5.702	75.9
May	4.099	210.0
June	5.137	216.3
July	5.338	239.9
August	5.473	232.6
September	4.382	226.2
October	7.160	61.0
November	9.595	53.6
December	11.069	59.1
Average	**6.474**	**65.1**

Source: Impact Energy Asia Development Limited

8.3.4 Air Quality

Based on the local EIA (EIA, 2022), air quality surveys were undertaken for three continuous days from 17-19 September 2020 by Innogreen, in collaboration with Phanthamit Analytical Lab Co., Ltd. It should be noted that September is at the end of the rainy season when air quality is generally much better than towards the dry season, when large areas of the country are impacted by slash-and-burn agriculture in preparation for rice planting, which is part of the shifting cultivation practiced in the region. As such, this seasonal variability should be taken into account during the monitoring of the air emissions from the project scheduled to run throughout 2023 and 2024. The sampling locations are as follows (and shown in ***Figure 8-3***):

A1: Ban Xiengluang, Dak Cheung District, Sekong Province (72°43'87N, 16°96'54.1E (UTM WGS 1984 Zone 48N)); and

A2: Ban Dak Run, Dak Cheung District, Sekong Province (741488N, 1704935E (UTM WGS 1984 Zone 48N)).

Two air monitoring locations have been selected given that the Project is located within remote areas and it is assumed that the air parameters (TSP, PM_{10}, $PM_{2.}5$, CO, SO_2, NO_2) will be relatively low and homogenous across the site. There is limited industrial or anthropogenic inputs in the AoI that would lead to variations in air quality. Based on the nature and scale of the Project, impacts from air emission are considered of low significance.

The parameters were based on the national environmental standards of 2017 that include particulate matter 2.5 microns in size (PM-2.5), particulate matter not exceeding 10 microns (PM-10), total suspended particulates (TSP), carbon monoxide (CO), sulphur dioxide ambient air (SO_2), and nitrogen dioxide ambient air (NO_2).

Air monitoring results from the local EIA (EIA, 2022) are presented in ***Table 8-4***. The air quality monitoring data showed that all parameters were within Laos regulations, Environmental, Health, and Safety Guidelines for IFC and WHO for Air Quality Guidelines. This indicates that the ambient air quality within and around the Project area is in good condition.

Table 8-4: Air Quality Monitoring Result (Local EIA, 2022)

No.	Parameters	Unit	Monitoring Result						Laos Standard[1/]	International Guideline [2/]
			A1: Ban Xiengluang			A2: Ban Dak Run				
			17/09/2021	18/09/2021	19/09/2021	21/09/2021	22/09/2021	23/09/2021		
1	PM-2.5	mg/m^3	ND	ND	ND	ND	ND	ND	0.05	**0.015**
2	PM-10	mg/m^3	0.005	ND	0.008	0.022	0.022	0.006	0.12	**0.045**
3	TSP	mg/m^3	0.012	0.006	0.007	0.024	0.026	0.022	0.33	-
4	CO 1 hr	ppm	0.01-0.09	0.02-0.09	0.01-0.07	0.07-0.19	0.20-0.39	0.17-0.29	30	**30.552**
	CO 8 hr (average)	ppm	0.055	0.06	0.04	0.15	0.31	0.21	9	**8.729**
5	SO_2 1 hr	ppm	0.000-0.007	0.000-0.007	0.000-0.007	0.000-0.011	0.001-0.006	0.002-0.010	0.13	-
	SO_2 24 hr (average)	ppm	0.003	0.003	0.003	0.004	0.003	0.005	0.05	**0.015**
6	NO_2 1 hr	ppm	0.001-0.01	0.001-0.008	0.001-0.009	0.000-0.002	0.000-0.002	0.000-0.009	0.11	**0.106**
	NO_2 24 hr (average)	ppm	0.005	0.003	0.004	0.000	0.000	0.004	0.02	**0.005**

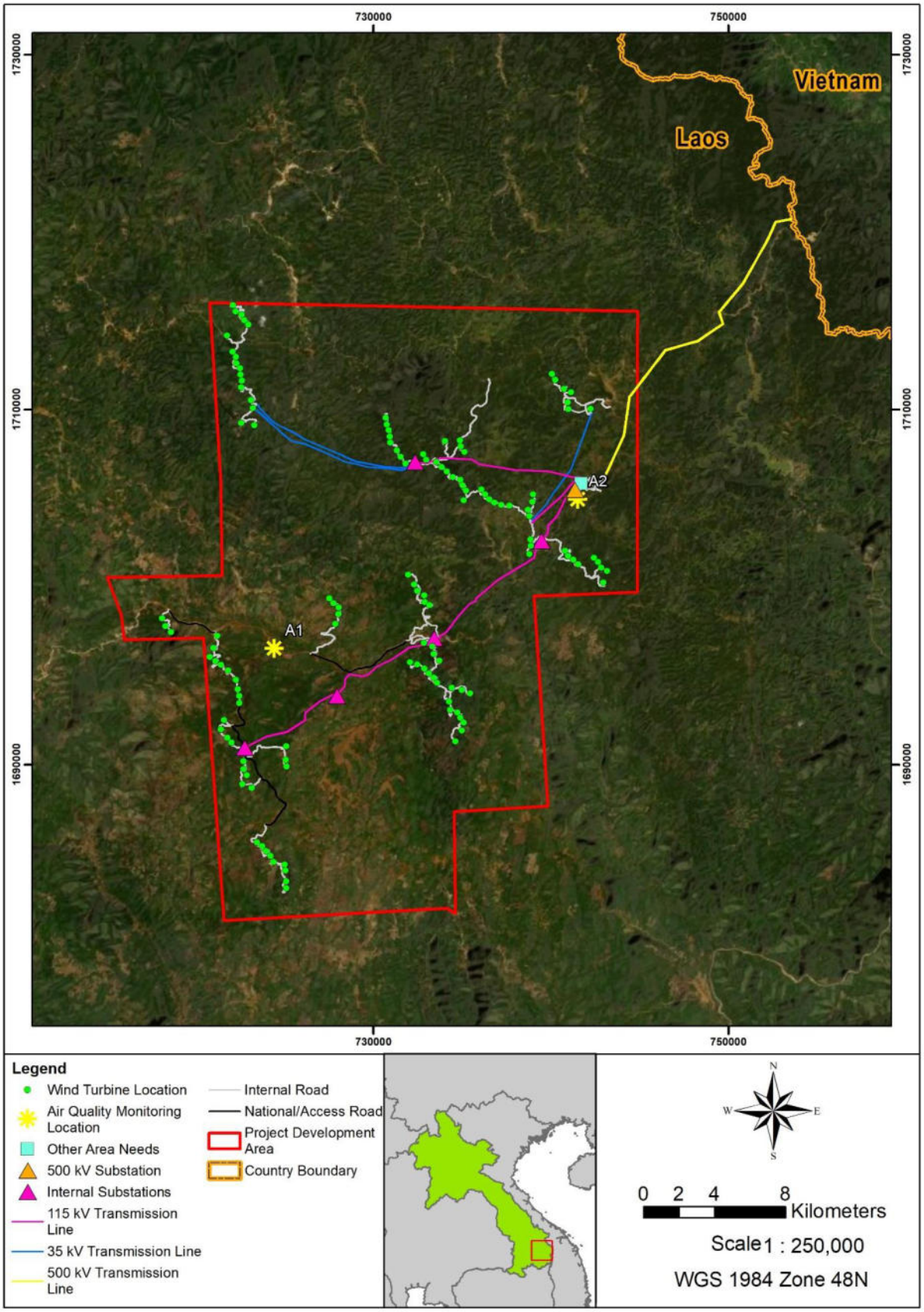
Source: EIA, 2022

Note:

[1/] General Air Quality Standard. National Environmental Standard (No 81 NA). 21 February 2017, ND = Not Detected (Limit of detection is 0.002 mg/m^3)

[2/] World Health Organization. (2021). WHO global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. World Health Organization. https://apps.who.int/iris/handle/10665/345329. License: CC BY-NC-SA 3.0 IGO

Figure 8-3: Air Sampling Locations



8.3.5 Noise

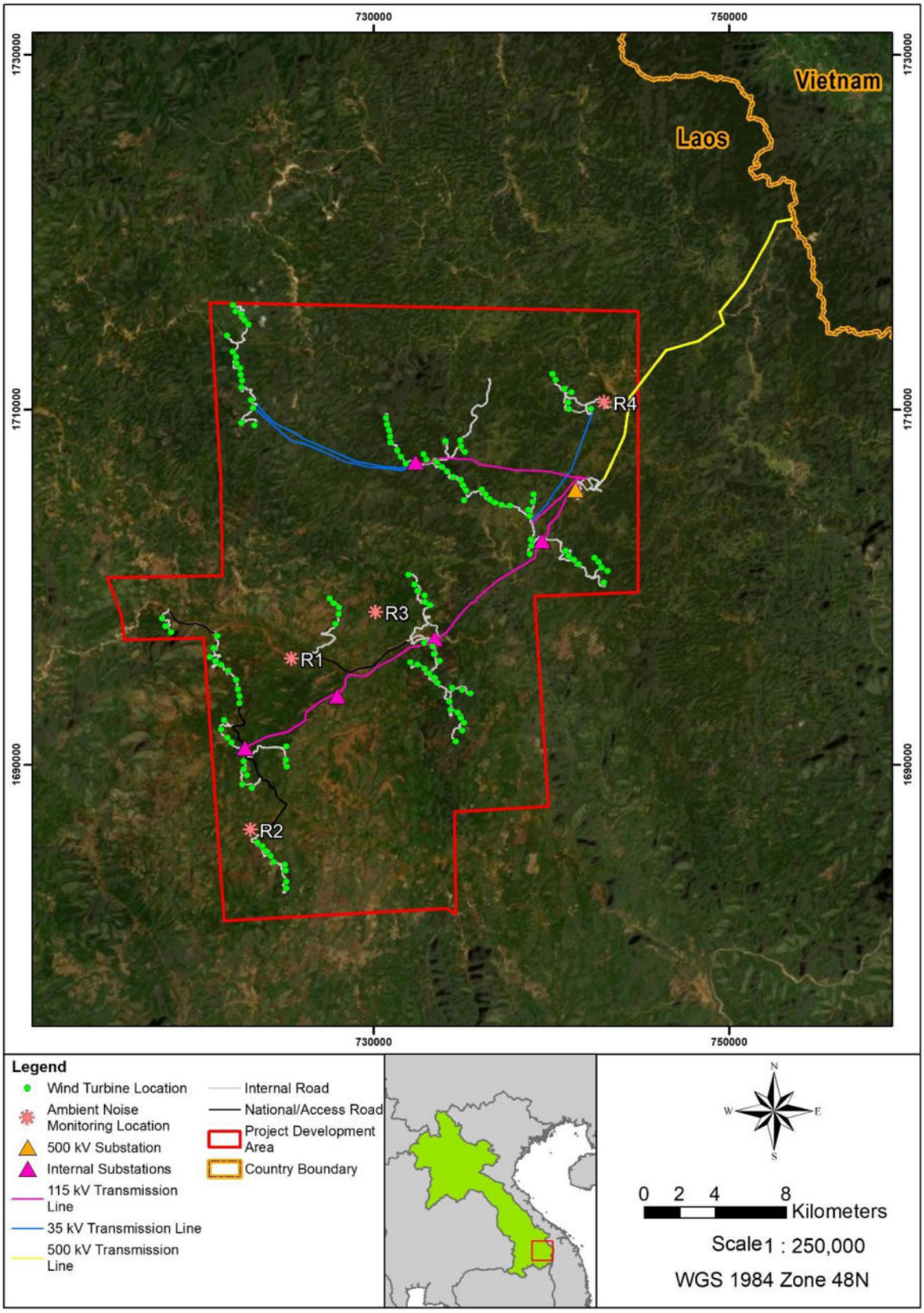
In order to establish wind farm noise limits, background noise monitoring is required to establish the pre-existing environment as a function of wind speed. As wind speed increases generally the background noise levels at most receptors also increases, as natural sources, such as the wind through the trees, begin to dominate. The variation of background noise with wind speed is usually quite site specific and related to various physical characteristics, such as topographic shielding and the extent and height of exposed vegetation.

Background noise measurements have been carried out by Innogreen at four representative monitoring locations in the vicinity of the Project site. The monitoring locations are described in ***Table 8-5*** and are illustrated in ***Figure 8-4***. Background noise measurements were carried out between August-November 2021 (13-16 Aug, 28-31 Oct, 1-2 Nov and 9-12 Aug).

Table 8-5: Noise Sampling Locations

Location	General location	Coordinates	Parameters	Monitoring Frequency and Duration
R1	Monitoring point located at the school of Xiengluang village, wind turbine W110 located c.1km southeast of the monitoring point, and health center located c.0.3km northeast of the monitoring point.	15°19'49.83"N 107° 5'56.35"E	L_{eq}1hr L_{eq}24hr L_{eq} L_{max} L_{min} L_{10} L_{90}	**Frequency**: Once **Duration:** Over 3 consecutive days
R2	Monitoring point located in the Daksamor village, c.0.5km from internal road, wind turbine W142 located c.0.7km southeast of the monitoring point, the health center located c.0.2km northeast of the monitoring point, and the school located c.03km northeast of the monitoring point.	15°14'37.23"N 107° 4'35.88"E		
R3	Monitoring point located in the Dakbrang village, wind turbine W095 located c. 0.4km northeast of the monitoring point, and the school located c.0.2 km north of the monitoring point.	15°21'13.47"N 107° 8'36.42"E		
R4	Monitoring point located in the Dakcheung village, wind turbine W154, located c.8km southwest of the monitoring point, and the hospital located c.0.2km southeast of the monitoring point.	15°27'33.65"N 107°15'51.33"E		

Figure 8-4: Noise Monitoring Locations



8.3.5.1 Noise Monitoring Procedure

The noise monitoring procedure was undertaken in accordance with ISO 1996 - 1:2016, which specifies that noise monitoring should be carried out using a Type 1 or 2 sound level meter as per IEC standards[33]. A sound level meter 1.5 m above the ground and no closer than 3 m to any reflecting surface (e.g., wall) was deployed at each station. A portable weather station was positioned close to each sound level meter to simultaneously measure the wind speed (in a series of 10-minute intervals).

Noise levels were measured continuously for 72 hours with data logging every 10 minutes. Weather conditions (e.g., wind speeds), existing industrial condition and noise contribution from other noise sources at the monitoring locations were recorded and used for noise analysis. Field logs for all survey work, noting the date and time of the survey, equipment used, and a record of all activities and observations, calibration sheets, and noise monitoring raw data can be found in ***Appendix B***.

Regression analyses of the background noise data and the hub height wind speed data were carried out to determine a line of 'best fit' from the baseline noise measurements, from which the noise impact assessment criteria have been established as a function of wind speed.

8.3.5.2 Wind Speed Monitoring

The data was recorded in 10-minute intervals and this data was converted to provide the average wind speed at a nominal hub height of 110 m. The conversion applied an extrapolation based on a log law method, as set out in Section 2.1.5 of the Institute of Acoustics (IOA) Good Practise Guide (GPG) Supplementary Guidance Note 4: Wind shear[34]. The shear factors used in the calculation were extracted from the vertical speed profile wind model.

The IAO GPG describes the derivation of noise limits based on a 'standardized' wind speed at a height of 10 m. Wind turbine sound power levels in the past have been reported with reference to the 'standardized' wind speed at 10 m height. However, the 3rd Edition (2012) of IEC61400-11[3,35] mainly requires sound power levels to be stated in relation to the hub height wind speed. As such, wind speed at a nominal hub-height of 110 m has been selected as the preferred reference wind speed for this analysis.

8.3.5.3 Noise Monitoring Results

Noise level (equivalent continuous sound pressure level with 'A' frequency weighting - LAeq) measured at the four (4) monitoring locations met the World Bank Group (WBG) Criteria which is more stringent than Lao National Ambient Noise Standard for most of the monitoring duration in the daytime (07:00 - 22:00). The exceeded noise level measured in the night-time (22:00-7:00) were likely due to interference of the local activities such as household activities, the movement of in-used vehicles, and animal (chicken, dogs, and buffalo). Noise monitoring results for each monitoring location are shown in ***Figure 8-5*** to ***Figure 8-8*** and discussed in detail below.

- **R1 located at the school of Xiengluang village**: Day and night time noise levels are below the equivalent WBG noise standards. The main sources of noise were from road users (truck, car, and motorbike) as well as noise from community and farm animals.
- **R2 located in the Daksamor village**: Noise levels at this location exceeded the day time and night-time WBG criteria. The main sources of noise were from local communities / domestic noise, dogs, and music.

[33] International Finance Corporation (2017). *Environmental, Health, and Safety (EHS) Guidelines*. World Bank Group. https://www.ifc.org/wps/wcm/connect/4a4db1c5-ee97-43ba-99dd-8b120b22ea32/1-7%2BNoise.pdf?MOD=AJPERES&CVID=nPtgwZY

[34] Institute of Acoustics (2014). *A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise – Supplementary guidance note 4: Wind Shear*

[35] International Electrotechnical Commission (2012). IEC 61400-11 Edition 3.0 2012-11. *Wind turbines – Part 11: Acoustic noise measurement techniques*

- **R3 located in the Dakbrang village**: Noise levels during daytime at receptor R3 were on average below the WBG daytime criteria. During night-time, noise levels generally exceeded the WBG night-time criteria. The main sources of noise were from local communities / domestic noise, and farm animals.
- **R4 located in the Dakcheung village**: During day and night time, measured noise levels at R4 are generally within the WBG night time noise criterion of 45 dB(A). R4 is an isolated receptor far from roads or many residential properties.

Figure 8-5: Noise Monitoring Result at R1

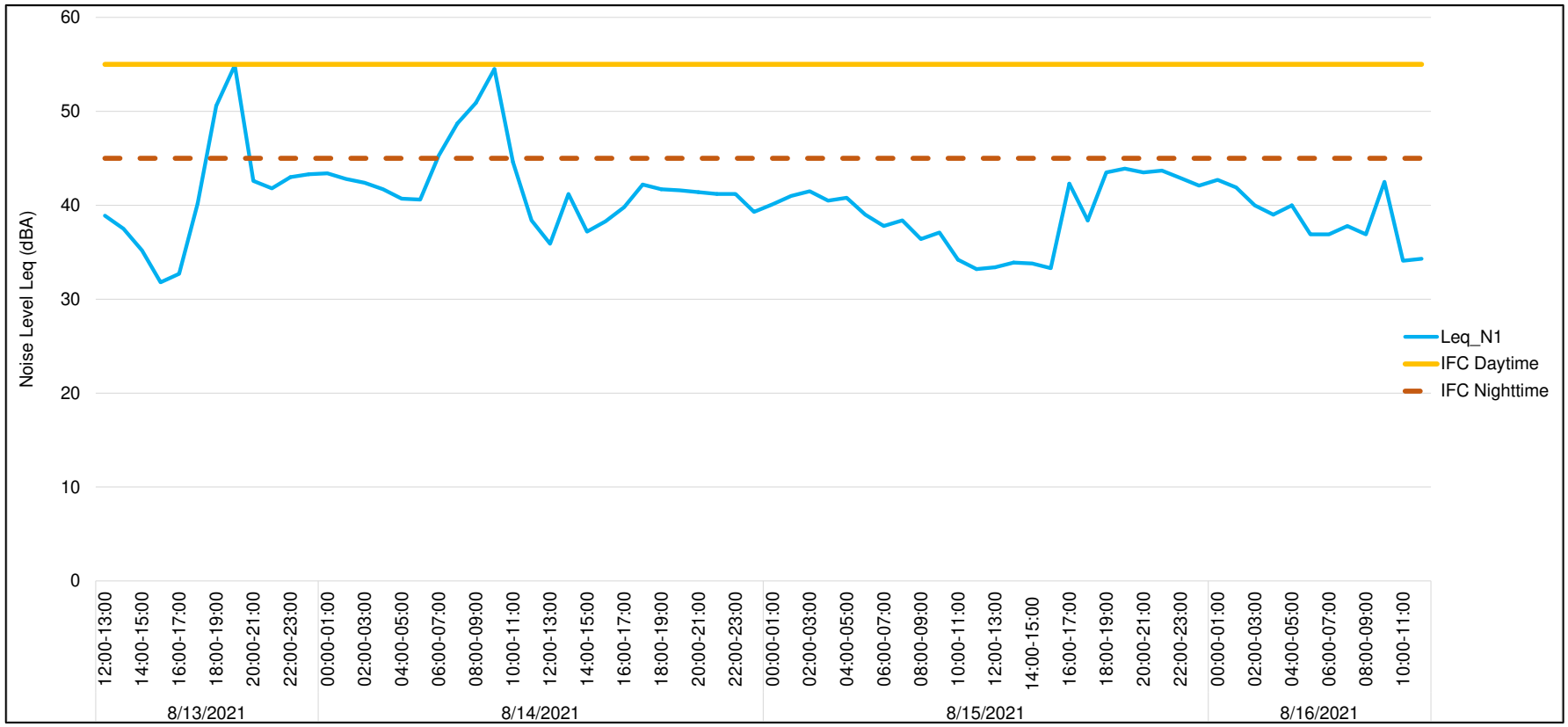


Figure 8-6: Noise Monitoring Result at R2

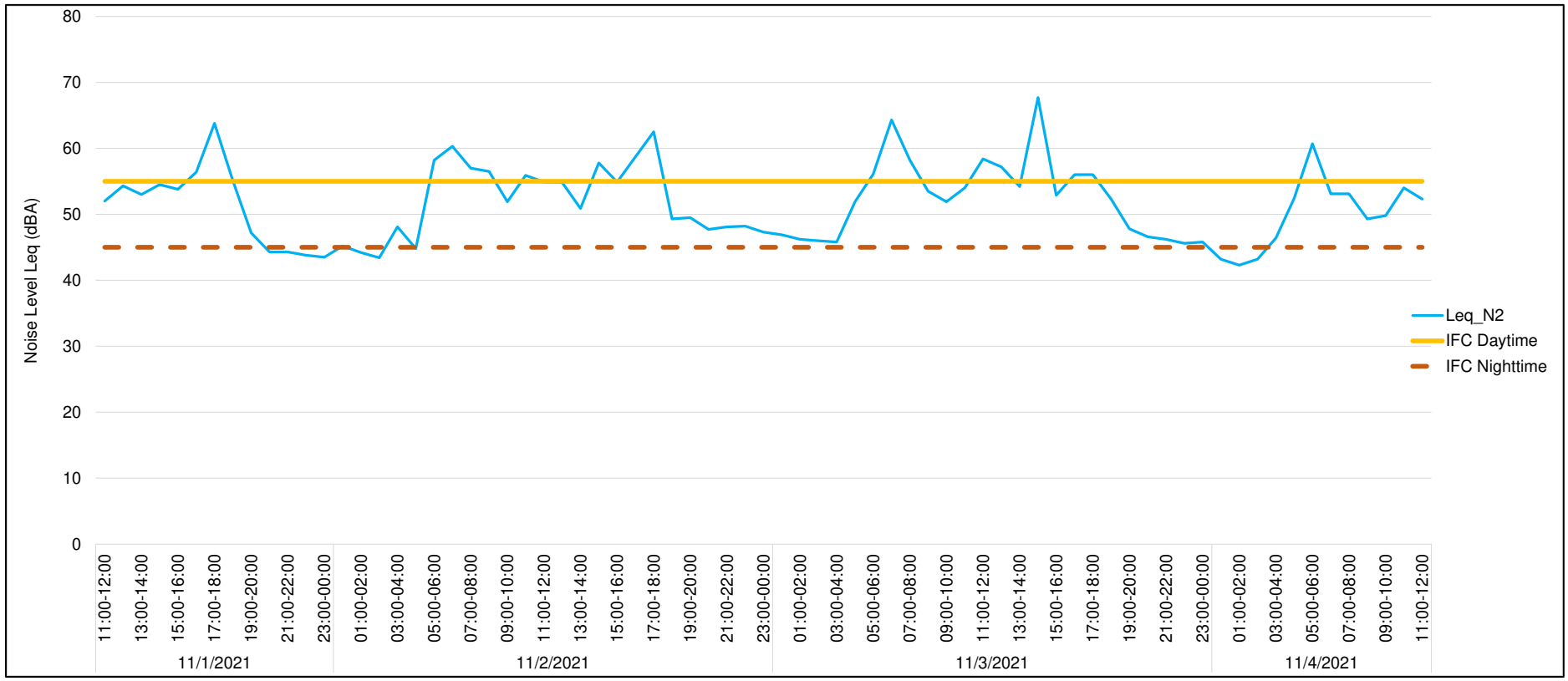


Figure 8-7: Noise Monitoring Result at R3

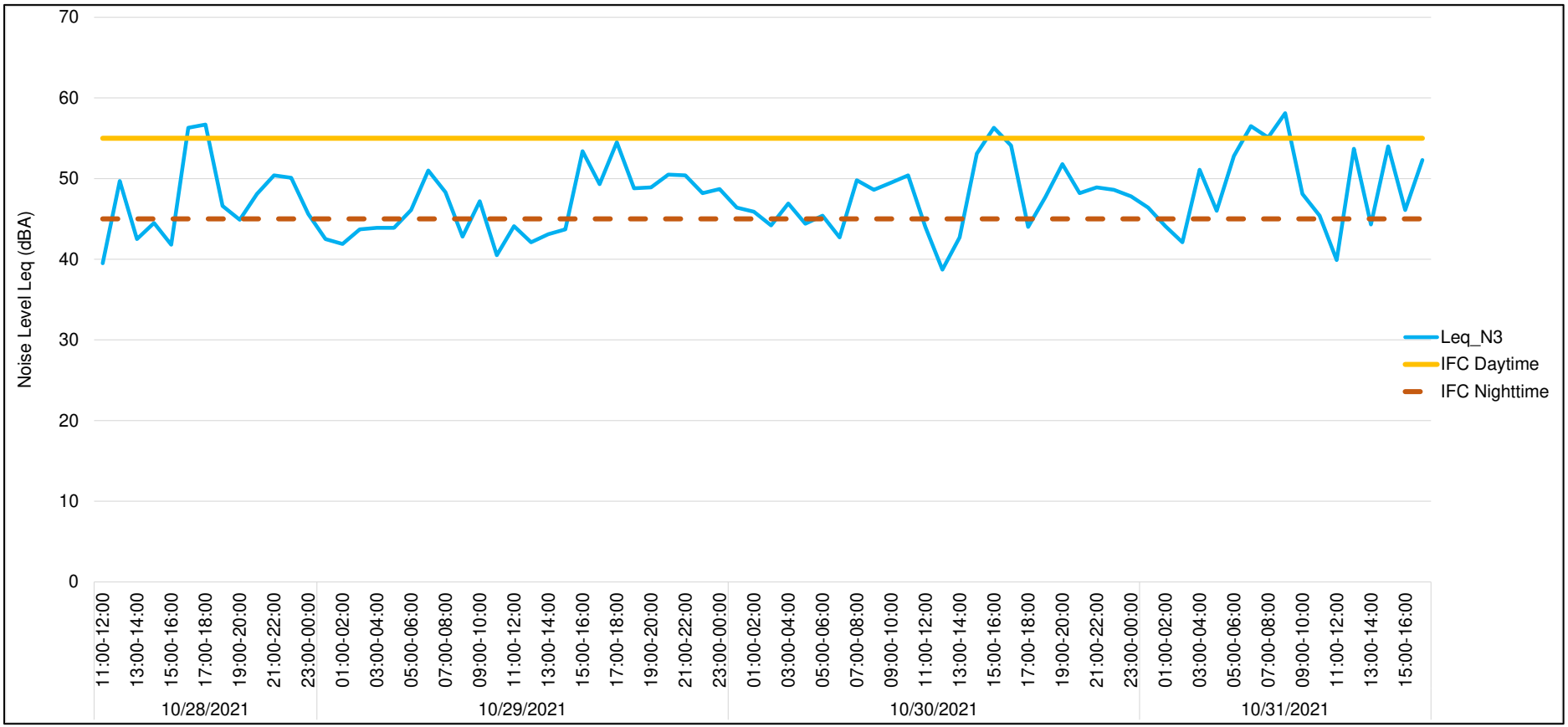
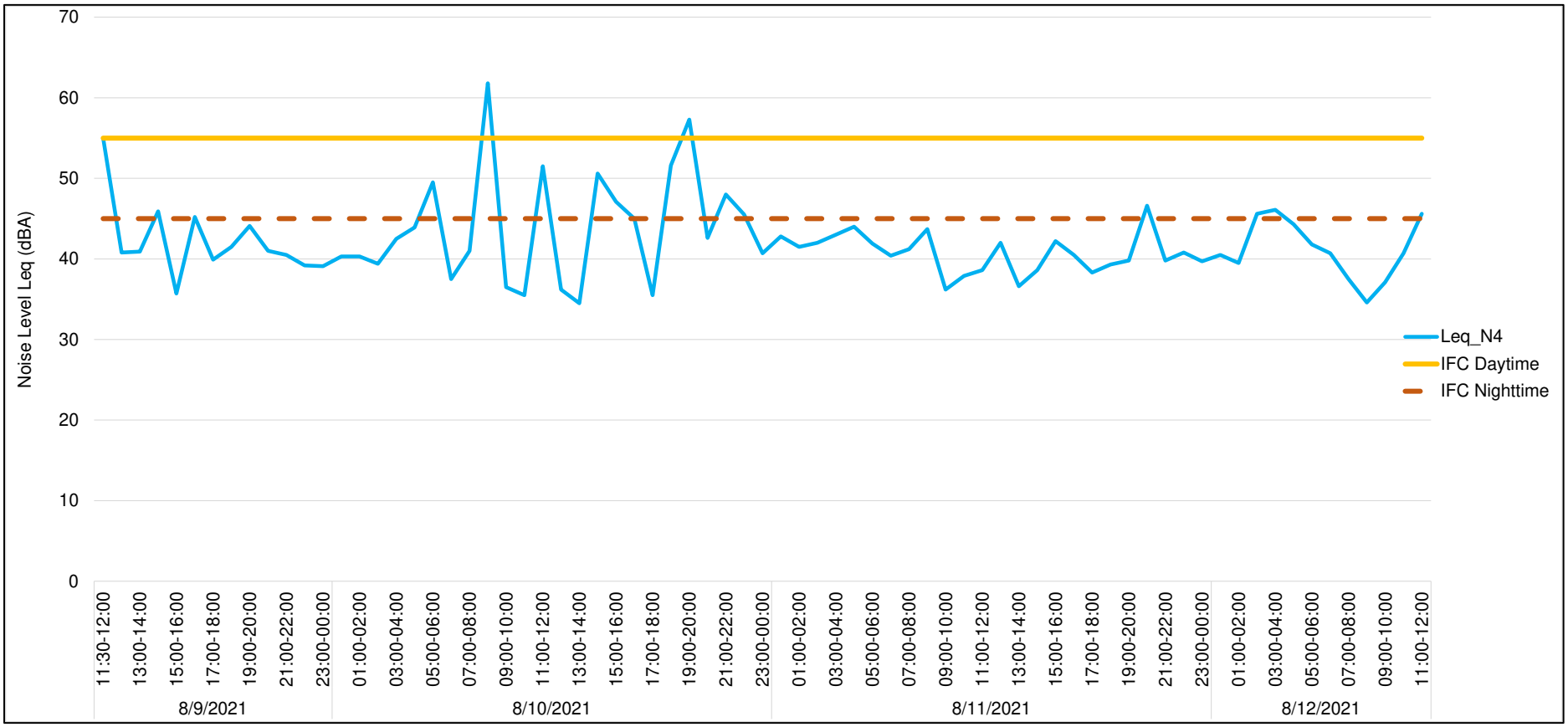


Figure 8-8: Noise Monitoring Result at R4



8.3.5.4 Background Noise Analysis

Limited rainfall was observed during the three day measurement period at each receptor. The noise data during rainfall over the 10-min intervals were excluded from the data analysis.

The existing acoustic environment is mainly driven by noise sources related to human activities, such as traffic or power generators, which probably lead to increased noise levels during night-time.

Despite the expectation, a weak correlation has been found between wind speed and noise level, meaning that some other factors were influencing the measurements.

Table 8-6 summarizes the total, excluded, remaining valid, day, and night 10-min periods for each location.

Table 8-6: Time Periods for Noise Measurements Occurred Every 10-Min

Location	Number of Points				
	Total	**Excluded**	**Remaining Valid**	**Day time**	**Night time**
R1	433	26	407	245	162
R2	439	0	439	277	162
R3	469	15	454	298	156
R4	433	21	412	255	159

The measured existing background noise levels based for the different wind speeds are presented in ***Table 8-7***.

Regression has been made for both 24 hours and the day/night period to accomplish both the requests of Lao PDR national criteria and WBG criteria.

Table 8-7: Background noise level at Monitoring Location

Location	Time period	Background Noise Level L90 (dBA) at 110m height wind speed (m/s)							
ID		**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
R1	24 hours	40	40	40	40	40	40	40	40
	Day-time	41	41	42	42	43	43	44	44
	Night-time[(1)]	40	40	40	39	39	38	38	38
R2	24 hours	45	45	45	45	45	45	45	45
	Day-time	46	47	47	48	49	49	50	50
	Night-time	44	45	45	45	46	46	46	47
R3	24 hours	43	44	45	46	47	48	49	50
	Day-time	42	44	45	46	47	48	49	50
	Night-time	44	45	45	46	47	48	49	49
R4	24 hours	39	39	39	39	40	40	40	41
	Day-time[(1)]	37	37	37	37	37	37	37	37
	Night-time	40	40	40	40	40	40	40	41

Notes:

[1] Weak regression

A weak correlation has been found on receptors R1 and R4 between wind speed and noise levels. Background noise level typically increases with the increase of wind speed, because of wind-induced

noise generated around objects or vegetation (***Figure 8-9*** - ***Figure 8-12***). The line of best fit for the data set is determined using a linear trend line, which provides a correlation between wind speed and background noise level.

It can also been seen that night time noise levels at location R3 and R4 are greater than day time. ERM assumes this is a result of either due to insect noise or the operation of power generators.

As the data do not provide a clear correlation between wind speed and measured noise level on R1 and R4; the absolute criteria of WBG has been considered for the assessment purpose in comparison with the predicted model noise.

Figure 8-9: Background Noise Measurements against Wind Speed for R1

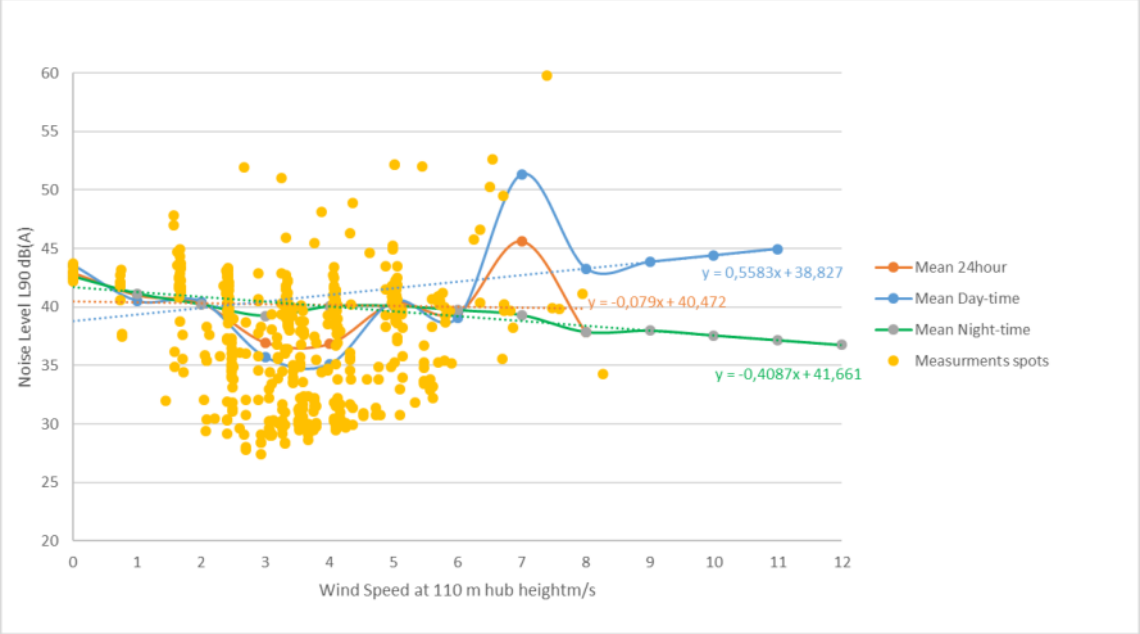


Figure 8-10: Background Noise Measurements against Wind Speed for R2

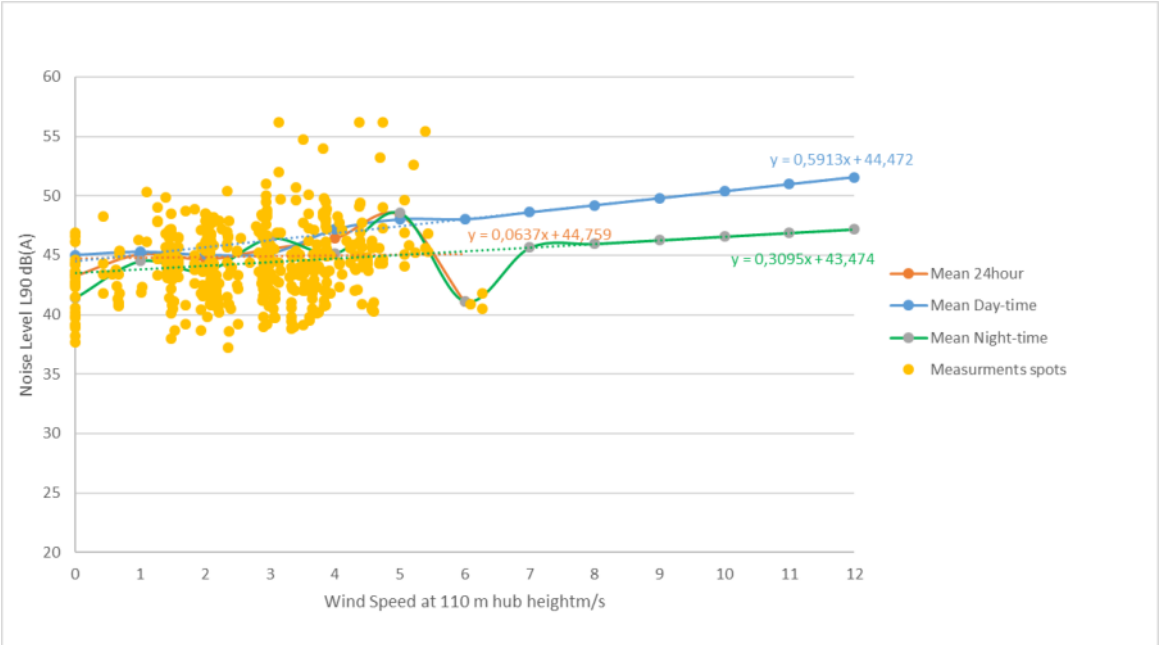


Figure 8-11: Background Noise Measurements against Wind Speed for R3

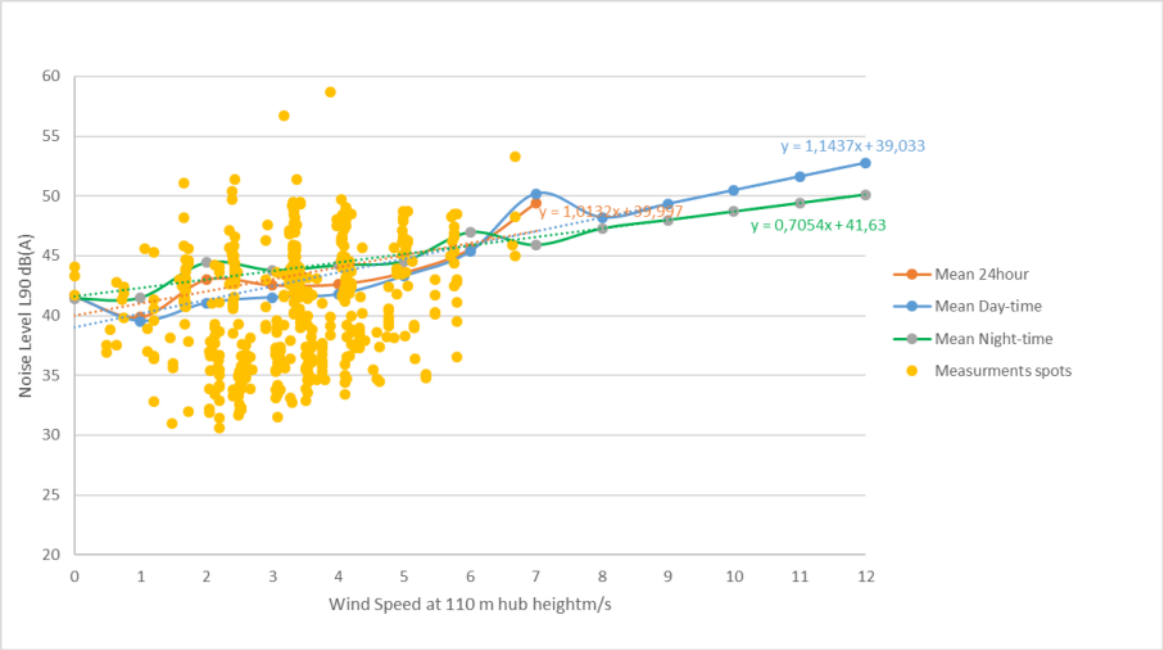
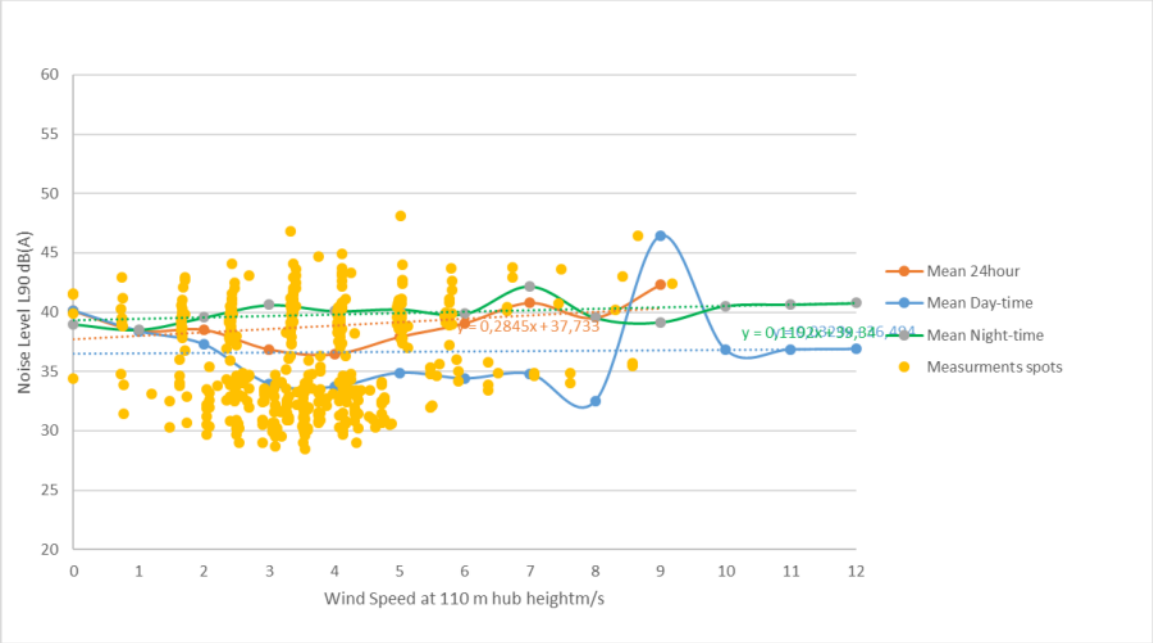


Figure 8-12: Background Noise Measurements against Wind Speed for R4



8.3.6 Surface Water Quality

8.3.6.1 Surface Water Monitoring – Reference from the local EIA

The people have mainly used water from the streams. The water flow direction depends on the topographic characteristics of the area. Important water sources in the study area, such as Houay Nuan, Houay Lo, Houay Bouat, Houay Ang, Houay Hok, Houay Air, Houay Preed, Houay Joon, Houay Nam Ngon and Houay Nheun. The characteristics of these streams are similar, such as large streams have water all year round, and most small streams have less water during the dry season.

Baseline data collection for surface water was undertaken on 23 September 2020 by Innogreen, in collaboration with Phanthamit Analytical Lab Co., Ltd, based on the ESIA. The parameters were based on the National Environmental Standards No. 81/GOV, 2017. It is to be noted that water quality will vary with seasonal influences, therefore a single sampling event will not capture the range of the water quality experienced by the streams being surveyed.

The sampling locations included (as shown in ***Figure 8-13***):

- SW01: Houay Nam Ngon River in Ban Nam Ngon, Sanxay District, Attapeu Province (73°10'03N, 16°84'39.9E (UTM WGS 1984 Zone 48°N));
- SW02: Houay Joon River in Ban Dak Padou, Sanxay District, Attapeu Province (736057N, 1690997E (UTM WGS 1984 Zone 48N));
- SW03: Houay Preed River in Ban Xiengluang, Dak Cheung District, Sekong Province (722427N, 1692294E (UTM WGS 1984 Zone 48N));
- SW04: Houay Air River in Ban Sieng Mai, Dak Cheung District, Sekong Province (722309N, 1701964E (UTM WGS 1984 Zone 48N)); and
- SW05: Houay Nheung River in Ban Dak Dor, Dak Cheung District, Sekong Province (738037N, 1700351E (UTM WGS 1984 Zone 48N));

Surface water monitoring results from the local EIA (EIA, 2022) are presented in ***Table 8-8***. The parameters of SW01, SW02, and SW05 were within Laos regulations. These monitoring locations are natural streams along the valley, covered with trees and some land area used for agricultural production, such as; cassava cultivation, upland crop cultivation along the slope of the mountain, and a small area is used for rice cultivation.

The parameters of SW03 and SW04 were mostly within the standards except for measurements of phenol (C_6H_6O). SW03 is in the area of Ban Xiengluang at Houay Preed, the boundary area connecting to Ban Dak Dor. The area near the stream consists of unstocked forest, agricultural land, and a fruit-tree plantation company. Phenol is an important industrial product that is used as a basic chemical in many kinds of products, primarily used in plastic synthesis and related materials, and as chemical in herbicide products. As such, the presence of the industry in the area may be the cause of the high value of Phenol in the water. SW04 is in the area of Ban Sieng Mai, Houay Air and has quite a large stream. There are villages located at the upper bank of the stream, including a rice field area, and cultivation area for crops. The area consists of natural high and steep rock mountains, which may contain minerals underground. There is frequent rainfall that causes water to flow over various sources that may cause the water contamination.

Figure 8-13: Surface Water Sampling Locations

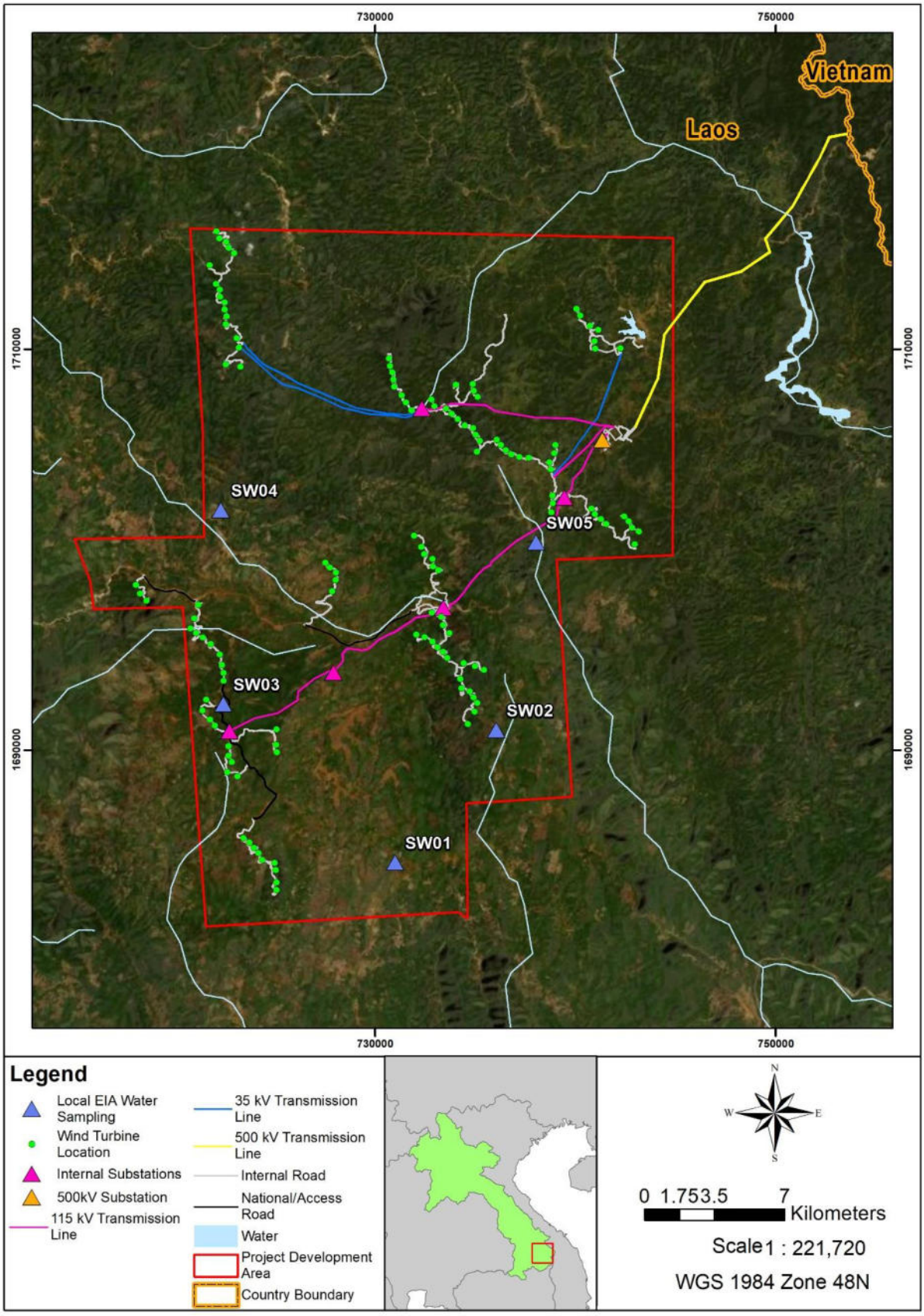


Table 8-8: Surface Water Monitoring Result

No.	Parameter	Unit	Surface Water Monitoring Result					Water Quality Standards[1/]				
			SW01	SW02	SW03	SW04	SW05					
			23/09/20 (10.45 am)	23/09/20 (02.25 pm)	23/09/20 (11.45 am)	23/09/20 (10.25 am)	23/09/20 (01.15 pm)					
			Village Name									
			Nam Ngon	Dak Padou	Xiengluang	Sieng Mai	Dak Dor					
			Stream Name									
			Nam Ngon	Houay Jool	Houay Preed	Houay Air	Houay Nheung	1	2	3	4	5
1	Odor	-	Odourless	Odourless	Odourless	Odourless	Odourless	-	-	-	-	-
2	Color (Field work)	-	Orange	Clear	Clear	Dark yellow	Grey			Colourless		
3	Color	-	23.9	14	5.56	28.8	17.7	-	-	-	-	-
4	Water temperature	°C	21	23	20.8	20.5	24	-	-	-	-	-
5	pH	-	7.4	7.1	6.4	7.1	7.1	6.0-8.0	6.0-8.0	5.0-9.0	5.0-9.0	-
6	DO	mg/L	8.50	8.90	7.25	8.80	8.25	>7	6.0	>4.0	2.0	<2
7	Conductivity	ms/cm	18.8	22.8	9.90	21.6	24	<500	≤1000	≤2000	≤4000	>4000
8	COD	mg/L	6.30	ND	ND	ND	1.89	>5	5-7	7-10	10-12	<12
9	TSS	mg/L	20	8.95	ND	34.4	11	>10	≥25	≤40	≥60	<60
10	As	mg/L	ND	<0.0020	ND	<0.0020	ND	0.01	0.01	0.01	0.01	-
11	Cd	mg/L	ND	ND	ND	ND	ND	0.003	0.003	0.003	0.003	-
12	Cu	mg/L	ND	ND	ND	ND	ND	1.5	1.5	1.5	1.5	-
13	Cr^{+6}	mg/L	ND	ND	ND	ND	ND	-	-	-	-	-
14	CN^{-}	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	0.07	0.07	0.07	0.07	-

No.	Parameter	Unit	Surface Water Monitoring Result					Water Quality Standards[1/]				
			SW01	SW02	SW03	SW04	SW05					
			23/09/20 (10.45 am)	23/09/20 (02.25 pm)	23/09/20 (11.45 am)	23/09/20 (10.25 am)	23/09/20 (01.15 pm)					
			Village Name									
			Nam Ngon	Dak Padou	Xiengluang	Sieng Mai	Dak Dor					
			Stream Name									
			Nam Ngon	Houay Jool	Houay Preed	Houay Air	Houay Nheung	1	2	3	4	5
15	Pb	mg/L	ND	ND	ND	ND	ND	0.01	0.01	0.01	0.01	-
16	Mn	mg/L	0.04	<0.03	<0.03	0.09	0.05	1.0	1.0	1.0	1.0	-
17	Hg	mg/L	ND	ND	ND	ND	ND	0.001	0.001	0.001	0.001	-
18	Ni	mg/L	ND	ND	ND	ND	ND	0.1	0.1	0.1	0.1	-
19	NO_3-N	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	5.0	5.0	5.0	5.0	-
20	Phenol	mg/L	ND	ND	0.031	0.016	0.008	0.005	0.005	0.005	0.005	-
21	PO4	mg/L	<0.46	<0.46	<0.46	<0.46	<0.46	>0.1	0.5	1.0	2.0	<2.0
22	Zn	mg/L	ND	ND	ND	ND	ND	1.0	1.0	1.0	1.0	-
23	NH_3-N	mg/L	0.28	0.20	0.30	0.25	0.42	0.5	0.5	0.5	0.5	-
24	NH_4^+	mg/L	0.36	0.26	0.39	0.32	0.54	≤0.5	≤1.5	≤3	≤4	4

Source: ESIA, Sept 2020

Note: *[1/] National Environmental Standards, No. 81/GOV, 2017 (Underlined value: exceed the standard)*

- Type 1: This is a natural water resource or ambient river, the raw water does not pass any treatment process and the water is not mixed with any chemical from industries and other activities.
- Type 2: This is a water source will be used for consumption, but requires treatment. This water source is suitable for aquatic life conservation, fish farming and others.
- Type 3: This is a water source will be used for consumption, but requires treatment. This water source is suitable for agriculture, livestock farming and others.
- Type 4 This is a water source will be used for consumption, but requires treatment. This water source is suitable for industrial activities, as receiving water body of wastewater discharge from the town or communities and others
- *Type 5 The water source is useful for communication, transportation and as receiving water body of wastewater discharge from the town and others*
- ND = not detected

8.3.6.2 Surface Water Monitoring – Supplementary Sampling

Surface water quality sampling was conducted on 12th August 2021 by Innogreen. Six (6) samples were taken in the Project area to analyze water quality parameters and compare against Laos Standards. An overview of the surveys and their results are presented in this section.

8.3.6.2.1 Surface Water Monitoring Locations

ERM recommended moving some of the original sampling locations proposed by Innogreen to a new location based on revisions to the site layout, identification of watercourses that have the potential to be impacted by the Project (e.g., turbines, site roads, watercourse crossings), and a set of comparable control sites, which are unlikely to be affected by any aspect of the development for the duration of the Project.

Surface water samples were collected at six (6) locations. A description for each of the sampling locations is shown in ***Table 8-9*** and the locations of each sampling site are shown in ***Figure 8-14.***

Given that the Project area has the potential presence of POPs in surface water and soil due to Agent Orange used during the Vietnam War, the Project will need to conduct pre-construction surface water monitoring (5 sampling locations) in the same locations, to identify and analyse the potential presence of POPs (refer to ***Section 9.3.6*** and ***Section 10.8*** of this report for water monitoring requirements).

Table 8-9: Supplementary Surface Water Sampling Locations

Sampling Station[1,2]		General location	Coordinates[3]	Parameters
No.	Type			
SW1	Control site, upstream of potentially affected site	Sampling point (Huaiy Pen River) to be located upstream of site road that intersects river and connects wind turbines WH153 to WH133	15°20'16.64"N 107° 3'34.42"E	■ Observations: ■ Odour ■ Colour ■ Turbidity ■ In-situ measurements: ■ pH ■ ORP (Oxidation Reduction Potential) ■ DO (Dissolved Oxygen) ■ Conductivity ■ Salinity ■ TDS (Total Dissolved Solids) ■ Water Temperature ■ Water depth ■ Laboratory analysis: ■ Calcium ■ Magnesium
SW2	Potentially affected site	Sampling point (Huaiy Pen River) to be located downstream of site road that intersects river and connects wind turbines WH153 to WH133	15°20'9.88"N 107° 3'43.34"E	
SW3	Control site, upstream of potentially affected site	Sampling point (Huaiy Keung River) to be located upstream of site road that intersects river and connects to wind turbines WH056 toWH065.	15°23'27.09"N 107°14'16.41"E	
SW4	Potentially affected site	Sampling point (Huaiy Keung River) to be located downstream of site road that intersects river and connects to wind turbines WH056 to WH065.	15°22'56.71"N 107°14'11.11"E	

Sampling Station[1,2]		General location	Coordinates[3]	Parameters
No.	Type			
SW5*	Potentially affected site	Sampling point (Huaiy Puang River) to be located downstream from existing site road but upstream of transmission line development area	15°27'10.79"N 107°16'9.83"E	■ Sodium ■ Potassium ■ Total Hardness ($CaCO_3$) ■ Alkalinity ($CaCO_3$) ■ Sulfate ■ Chloride ■ Total Suspended Solids ■ Total Coliform Bacteria ■ Oil and Grease ■ Total Nitrogen ■ Total Phosphorus ■ Ortho-Phosphorus ■ Ammonia ■ Biological Oxygen Demand (BOD) ■ Chemical Oxygen Demand (COD) ■ Mercury ■ Cadmium ■ Arsenic ■ Iron ■ Aluminum ■ Manganese ■ Lead ■ Zinc ■ Copper ■ Nickel ■ Nitrate ■ Nitrite ■ Pesticides ■ Other related measurements: ■ Ambient temperature
SW6	Control site, upstream of potentially affected site	Sampling point (Huaiy Puang River) to be located downstream of both SW5 and transmission line development area	15°27'27.15"N 107°16'54.51"E	

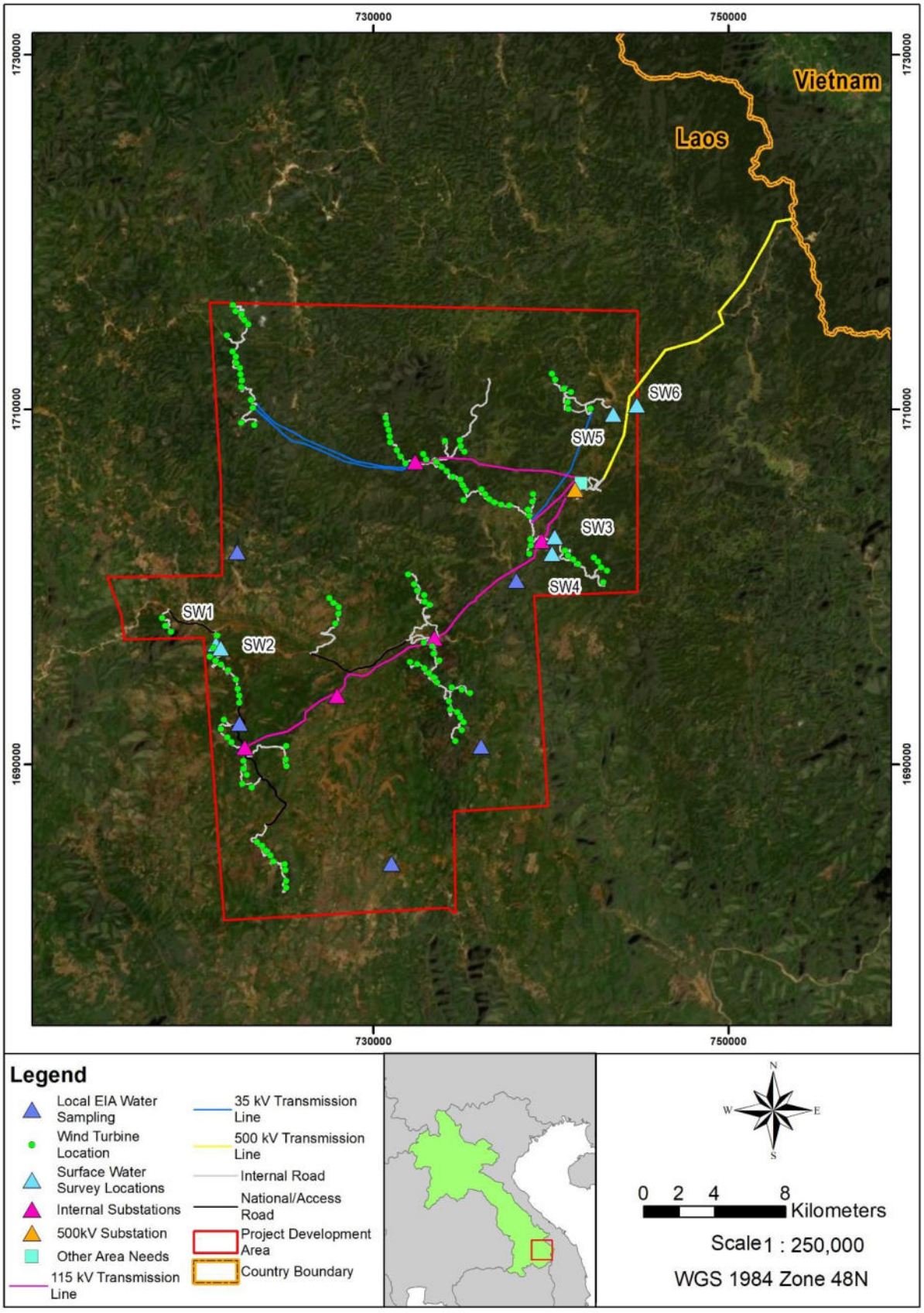
Notes:

[1] Sampling locations indicated with a star (*) were originally recommended by Innogreen.

[2] This does not include Quality Control (QC) samples such as blanks, and duplicates that were also collected by Innogreen.

[3] Coordinates are given in WGS84 datum and provided as guidance only; exact locations should be taken on-site using a hand-held Global Positioning System (GPS).

Figure 8-14: Supplementary Surface Water Sampling Locations



8.3.6.2.2 Surface Water Monitoring Methodology

Surface water sampling was conducted on 12 August 2021. In-situ testing was conducted by Innogreen. Grab water samples were collected for physio-chemical, bacteriological, and pesticide tests onsite, and samples were sent for laboratory testing. The sampling was conducted in strict accordance with recognized standard procedures or referring to the recommendation of the United States Environmental Protection Agency (U.S. EPA).[36] Field logs for all survey work, noting the date and time of the survey, equipment used, and a record of all activities and observations, can be found in ***Appendix C***.

8.3.6.2.3 Surface Water Monitoring Results

The chemical oxygen demand (COD) measurement at SW03-5 ranged from 11.7-21.5 mg/L, which exceed the 5-7 mg/ L limit and Coliform Bacteria at SW03 is 11,000 MPN/100 mL which exceed 5,000 MPN/100 mL according to the National Environmental Standards No.81/MONRE 2017. All other parameters are found to be within the Lao standards. When the COD levels are higher, there is a greater demand for oxygen. This means that there is likely more oxidizable organic material in water with high COD levels. However, no corresponding decrease was observed in Dissolved Oxygen (DO) concentrations (which were above the 6 mg/L standard). The high coliform bacteria levels usually correspond to human or animal waste / sewage in water (as observed in SW03). The surface water analysis results are shown in ***Table 8-10*** (refer to ***Appendix C*** for more detailed results).

[36] United States Environmental Protection Agency (EPA), National Primary Drink Water Regulations & National Secondary Drinking Water Regulation.

Table 8-10: Surface Water Sampling Results

No.	Sampling point		SW01	SW02	SW03	SW04	SW05	SW06	National Environmental Standards No.81/MONRE 2017
	Date		12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	
	Time		17:40	17:05	14:45	15:30	14:00	15:50	
	Village		Daktiem	Daktiem	Dakrun	Dakrun	Dakbong	Dakbong	
	Observations	Unit							
1	Oder		Non	Non	Non	Non	Non	Non	
2	Color		Clear	Clear	Clear	Clear	Clear	Clear	
3	Turbidity		light	light	light	light	light	light	
	On Site Parameters								
1	Temperature	°c	22.4	22.3	22	21.4	26.4	26.4	-
2	pH		7.9	7.9	7.3	7.4	7.4	6.3	6 – 8
3	DO	mg/L	9.7	8.3	9.1	9.4	9	10.8	6.0
4	Conductivity	ms/cm	7	7.4	27.7	41	25	26.4	≤ 1000
5	Salinity	ppt	0	0	0.01	0.02	0.01	0.01	-
6	TDS	ppm	3.5	3.7	13.9	20.7	13.6	13.2	-
	Laboratory Analysis								
8	Ammonia	mg/L	ND	ND	ND	ND	ND	ND	-
9	BOD	mg/L	<1.00	ND	<1.00	ND	<1.00	ND	-
10	COD	mg/L	5.53	ND	*21.5*	*12.9*	*11.7*	ND	5 – 7
11	Chloride	mg/L	ND	ND	ND	ND	ND	ND	-

No.	Sampling point		SW01	SW02	SW03	SW04	SW05	SW06	National Environmental Standards No.81/MONRE 2017
	Date		12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	
	Time		17:40	17:05	14:45	15:30	14:00	15:50	
	Village		Daktiem	Daktiem	Dakrun	Dakrun	Dakbong	Dakbong	
12	Hardness	mg/L	<10.0	<10.0	10.9	17.6	11.4	10.9	-
13	Fe (Iron)	mg/L	0.3	0.13	0.33	0.15	ND	0.44	-
14	Alkalinity	mg/L	<10.0	<10.0	16.8	24	16.8	14.4	-
15	Nitrate	mg/L	ND	ND	ND	ND	ND	1.5	-
16	Nitrite	mg/L	ND	ND	ND	ND	ND	ND	-
17	Oil & Grease	mg/L	ND	ND	ND	ND	ND	ND	-
18	Sulfate	mg/L	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	-
19	TSS	mg/L	<2.50	3.70	7.2	6.2	6.1	7.1	≤ 25
20	Ortho Phosphate	mg/L	ND	ND	ND	ND	ND	ND	-
21	Coliform Bacteria	MPN/100mL	2,200	2,100	*11,000*	3,900	4,900	2,100	5,000
22	Phosphorus	mg/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	-
23	Total Nitrogen	mg/L	<5	<5	<5	<5	<5	<5	-
24	ORP	mV	-63.7	-40.8	0.4	26.1	24.7	27.6	-
25	Aluminium	mg/L	0.19	0.21	0.15	0.17	0.22	0.26	-
26	Arsenic	mg/L	ND	ND	ND	ND	ND	ND	0.01
27	Cadmium	mg/L	ND	ND	ND	ND	ND	ND	0.003
28	Calcium	mg/L	<1.00	<1.00	1.90	4.02	2.31	2.16	-

No.	Sampling point		SW01	SW02	SW03	SW04	SW05	SW06	National Environmental Standards No.81/MONRE 2017
	Date		12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	
	Time		17:40	17:05	14:45	15:30	14:00	15:50	
	Village		Daktiem	Daktiem	Dakrun	Dakrun	Dakbong	Dakbong	
29	Mercury	mg/L	ND	ND	ND	ND	ND	ND	0.001
30	Copper	mg/L	ND	ND	ND	ND	ND	ND	1.5
31	Lead	mg/L	ND	ND	ND	ND	ND	ND	0.01
32	Magnesium	mg/L	<1.00	<1.00	1.76	1.95	1.47	1.41	-
33	Sodium	mg/L	1.26	1.12	1.65	1.49	1.4	1.22	-
34	Potassium	mg/L	1.15	<1.00	<1.00	2.41	<1.00	1.03	-
35	Zine	mg/L	ND	<0.03	ND	ND	ND	ND	1
36	Manganese	mg/L	<0.03	0.2	0.1	0.03	<0.03	<0.03	1
37	Nickel	mg/L	ND	ND	ND	ND	ND	ND	0.1
	Pesticides Organochlorine Group								
38	Aldrin	µg/L	ND	ND	ND	ND	ND	ND	0.1
39	a-BHC	µg/L	ND	ND	ND	ND	ND	ND	0.02
40	a-Endosulfan	µg/L	ND	ND	ND	ND	ND	ND	-
41	ß-BHC	µg/L	ND	ND	ND	ND	ND	ND	-
42	Dicofol	µg/L	ND	ND	ND	ND	ND	ND	-
43	ß-Endosulfan	µg/L	ND	ND	ND	ND	ND	ND	-
44	Dieldrin	µg/L	ND	ND	ND	ND	ND	ND	0.1
45	cis-Chlordane	µg/L	ND	ND	ND	ND	ND	ND	-
46	Endosulfan Sulfate	µg/L	ND	ND	ND	ND	ND	ND	-
47	Endrin	µg/L	ND	ND	ND	ND	ND	ND	-

No.	Sampling point		SW01	SW02	SW03	SW04	SW05	SW06	National Environmental Standards No.81/MONRE 2017
	Date		12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	
	Time		17:40	17:05	14:45	15:30	14:00	15:50	
	Village		Daktiem	Daktiem	Dakrun	Dakrun	Dakbong	Dakbong	
48	Y-BHC	µg/L	ND	ND	ND	ND	ND	ND	-
49	HCB	µg/L	ND	ND	ND	ND	ND	ND	-
50	Heptachlor	µg/L	ND	ND	ND	ND	ND	ND	0.2
51	Heptachlor-exo-epoxide	µg/L	ND	ND	ND	ND	ND	ND	0.2
52	Methoxychlor	µg/L	ND	ND	ND	ND	ND	ND	-
53	o,p'-DDT	µg/L	ND	ND	ND	ND	ND	ND	-
54	o,p'-DDE	µg/L	ND	ND	ND	ND	ND	ND	-
55	o,p'-DDD	µg/L	ND	ND	ND	ND	ND	ND	-
56	p,p'-DDD	µg/L	ND	ND	ND	ND	ND	ND	-
57	p,p'-DDE	µg/L	ND	ND	ND	ND	ND	ND	-
58	p,p'-DDT	µg/L	ND	ND	ND	ND	ND	ND	-
59	Total DDT	µg/L	ND	ND	ND	ND	ND	ND	1
60	trans-Chlordane	µg/L	ND	ND	ND	ND	ND	ND	-
61	Anilofos	µg/L	ND	ND	ND	ND	ND	ND	-
62	Azinphos-ethyl	µg/L	ND	ND	ND	ND	ND	ND	-
63	Azinphos-methyl	µg/L	ND	ND	ND	ND	ND	ND	-
64	Chlorfenvinphos	µg/L	ND	ND	ND	ND	ND	ND	-
65	Diazinon	µg/L	ND	ND	ND	ND	ND	ND	-
66	Dichlorvos	µg/L	ND	ND	ND	ND	ND	ND	-
67	Dicrotophos	µg/L	ND	ND	ND	ND	ND	ND	-

No.	Sampling point		SW01	SW02	SW03	SW04	SW05	SW06	National Environmental Standards No.81/MONRE 2017
	Date		12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	
	Time		17:40	17:05	14:45	15:30	14:00	15:50	
	Village		Daktiem	Daktiem	Dakrun	Dakrun	Dakbong	Dakbong	
68	Dimethoate	µg/L	ND	ND	ND	ND	ND	ND	-
69	EPN	µg/L	ND	ND	ND	ND	ND	ND	-
70	Ethion	µg/L	ND	ND	ND	ND	ND	ND	-
71	Ethoprophos	µg/L	ND	ND	ND	ND	ND	ND	-
72	Etrimfos	µg/L	ND	ND	ND	ND	ND	ND	-
73	Fenitrothion	µg/L	ND	ND	ND	ND	ND	ND	-
74	Fenthion	µg/L	ND	ND	ND	ND	ND	ND	-
	Organophosphate Group								
75	Malathion	µg/L	ND	ND	ND	ND	ND	ND	-
76	Methamidophos	µg/L	ND	ND	ND	ND	ND	ND	-
77	Methidathion	µg/L	ND	ND	ND	ND	ND	ND	-
78	Mevinphos	µg/L	ND	ND	ND	ND	ND	ND	-
79	Monocrotophos	µg/L	ND	ND	ND	ND	ND	ND	-
80	Omethoate	µg/L	ND	ND	ND	ND	ND	ND	-
81	Parathion-methyl	µg/L	ND	ND	ND	ND	ND	ND	-
82	Phosalone	µg/L	ND	ND	ND	ND	ND	ND	-
83	Phosphamidon	µg/L	ND	ND	ND	ND	ND	ND	-
84	Pirimiphos-ethyl	µg/L	ND	ND	ND	ND	ND	ND	-
85	Pirimiphos-methyl	µg/L	ND	ND	ND	ND	ND	ND	-
86	Profenofos	µg/L	ND	ND	ND	ND	ND	ND	-

No.	Sampling point		SW01	SW02	SW03	SW04	SW05	SW06	National Environmental Standards No.81/MONRE 2017
	Date		12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	12/8/2021	
	Time		17:40	17:05	14:45	15:30	14:00	15:50	
	Village		Daktiem	Daktiem	Dakrun	Dakrun	Dakbong	Dakbong	
87	Prothiofos	µg/L	ND	ND	ND	ND	ND	ND	-
88	Terbufos	µg/L	ND	ND	ND	ND	ND	ND	-
89	Triazophos	µg/L	ND	ND	ND	ND	ND	ND	-

Source: Innogreen, 2021.

Note: Underlined values exceed the limit

8.3.7 Landscape Values and Visual Amenity

This section provides a summary of the existing environmental conditions within the Project study area.

The local environmental setting was determined through desktop analysis and photos from fieldwork (performed in October 2021) to gain a general understanding of the site visual context and landscape setting. The field survey landscape assessment sheet can be found in ***Appendix D***.

8.3.7.1 Landscape Baseline

The landscape is characterized by different components: topography, land use and potentially sensitive areas relating to landscape (e.g., cultural heritage sites), and according to the presence of common elements. Therefore, the proposed assessment has been developed according to the following tasks:

- Definition of the landscape study area;
- Description of the baseline landscape and topography in the study area;
- Mapping and description of Landscape Character Unit (LCUs);
- Landscape character; and
- Landscape value.

8.3.7.1.1 Study Area

The landscape study area of the Project was identified as a buffer of 25 km from each turbine to understand the wider landscape setting and context and where it is assumed that most of the potential impacts will occur.

8.3.7.1.2 Topography

The topography of Laos is largely mountainous, with the Annamite Range in the northeast and east and the Luang Prabang Range in the northwest, among other ranges typically characterized by steep terrain. Elevations are typically above 500 meters with narrow river valleys and low agricultural potential. This mountainous landscape extends across most of the north of the country, except for the plain of Vientiane and the Plain of Jars in the Xiangkhoang Plateau (EIA, 2020).

The southern "panhandle" of the country contains large level areas in Savannakhét and Champasak provinces that are well suited for extensive paddy rice cultivation and livestock raising. Much of Khammouan Province and the eastern part of southern provinces are mountainous. Together, the alluvial plains and terraces of the Mekong and its tributaries cover about 20% of the land area.

The landscape of the Project Area and topography are shown in ***Figure 8-15*** and ***Figure 8-16***, respectively.