EXECUTIVE SUMMARY FOR THE PUBLIC (English Version)

Lumino Bislig Tree Plantation for Biomass Production Project

City of Bislig and Municipality of Lingig, Surigao del Sur

Version	:	1.0
Date	:	06-Feb-2023
Prepared by	:	GreenDevelopment Sustainable Solutions, Inc.

Project Fact Sheet

Name of Project:	Lumino Bislig Tree Plantation for Biomass Production Project
ECC Reference No.	**ECC-R13-2106-003**
Location of Project:	CADT R13-BIS-0408-070 (CADT 070) Barangays San Jose, Pamaypayan, and San Antonio Bislig City, Surigao Del Sur, Barangays Mahayahay, and Rajah Cabungsuan Lingig, Surigao Del Sur
Service Contract	Memorandum Of Agreement with Manobo/Mandaya Ancestral Domain Management Council (MMADMC) of CADT R13-Bis-0408-070
Project Type	**Issued ECC** • ***Tree Plantation:*** Category D – Non-Environmentally Critical Project (NECP) 2.2.1 Community Based Forest Resources Utilization Without Tree Harvesting (Non-ECP) 2.2.1 Community Based Forest Resources Utilization • ***Headquarter:*** Category B 3.6.2 Office and Residential Building (Non-ECP) with More Than 5 Hectares Total and Gross Floor Area • ***Road Widening:*** Category B. 3.4.2 (Non-ECP) Road Widening and Rehabilitation of Greater Than 20 Kms **Proposed Modification** • ***Inclusion of Tree Harvesting:*** Category A – Environmentally Critical Project (ECP) 2.2.1 Community Based Forest Resources Utilization with ≥ 10,000 m^3 Annual Volume of trees to be cut.
Project Area	Issued ECC: 11,845.43 hectares Proposed Modification: 10,507.11 hectares
Total Project Cost:	One Billion and Forty-Six Million Philippine Pesos (Php 1,046,000,000.00)
Project Duration:	Construction and development: 2 years Operation: 24 years Daily operational cycles: Tree planting and maintenance - eight hours per day Nursery operation and office works - eight hours per day Harvesting activities – eight hours per day
Proponent Profile	
Name of Proponent:	Lumino Energy Plantations, Inc. (LEPI)
Office address:	Km 8, Barangay San Jose, Bislig City
Contact Person:	Mr. Joel P. Lubguban – President Email Address: jlubguban@luminocapital.com Contact Number: 0968-854-3285
Authorized Representative for ECC application:	Joseph JR Anders Abella – Chief Operating Officer GreenDevelopment Sustainable Solutions, Inc. (GSSI)

Project Proponent

1 The implementation of the project will be carried out by Lumino Energy Plantations, Inc. (LEPI), a legitimate company based in the Philippines with the registration number CS201953529 and recognized by the Securities and Exchange Commission. LEPI's headquarters are located at Km. 8, Barangay San Jose, Bislig City, Surigao del Sur and is a subsidiary of Lumino Biomass Fuel, Inc.

ECC History

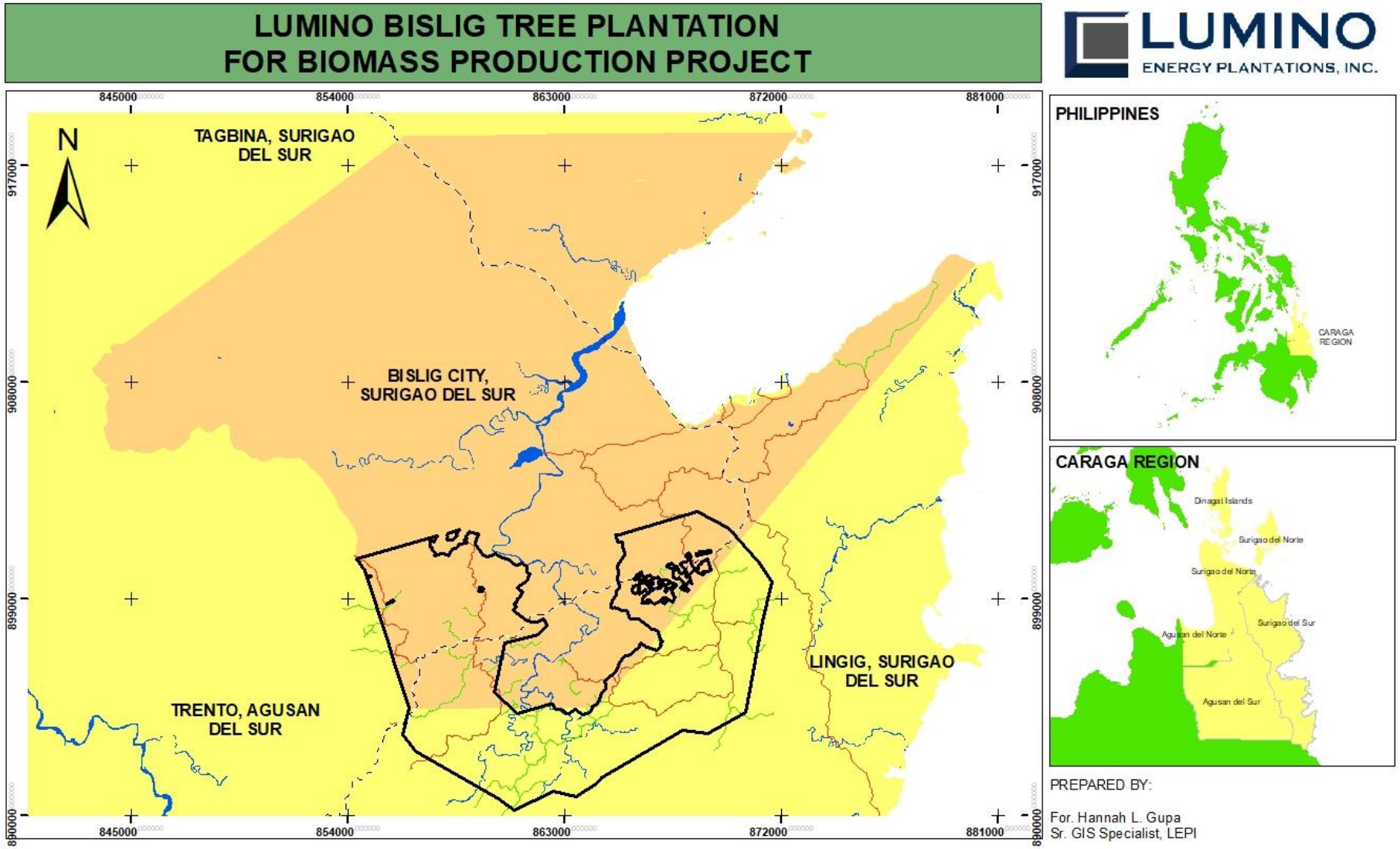
2 On July 07, 2021, Lumino Energy Plantations, Inc. (LEPI), the proponent, was granted by the Department of Environment and Natural Resources (DENR) through the Environmental Management Bureau (EMB) Region 13 an Environmental Compliance Certificate (**ECC-R13-2106-003**) for the **Lumino Bislig Tree Plantation Biomass Production Project** to be located in Barangays San Jose and Pamaypayan, Bislig City and Barangay Mahayahay, Lingig, all within the Province of Surigao del Sur. Under the approved ECC, the original project area covers 11,845.4 hectares property, acquired by the proponent though a Memorandum of Agreement with Manobo/ Mandaya Ancestral Domain Management Council (MMADMC) of **CADT R13-BIS-0408-070**.

Project Type and Size

3 In line with the current developments on the Project, rectification of CADT R13-BIS-0408-070 due to the adjustment of NGP areas, and its boundary adjustments following the dispute resolution of the IPs, and the new boundary survey conducted by NCIP dated May 25, 2022, LEPI proposes modification with the project components. Summarized below are the proposed modifications for this ECC amendment application.

General Overview of Proposed Modification

Description	ECC-R13-2106-005	Proposed Modification
Location	Barangays San Jose and Pamaypayan, Bislig City Barangay Mahayahay, Lingig	Barangays San Jose, Pamaypayan, and San Antonio Bislig City, Surigao Del Sur, Barangays Mahayahay, and Rajah Cabungsuan Lingig, Surigao Del Sur
Total Project Area	11,845.4 hectares	10,507.11 hectares
Project Type / Activity	Tree Plantation (Cat. D) Headquarter (Cat. B) Road widening (Cat. B)	Inclusion of harvesting with an annual yield of 932,500 cubic meters of wood materials (Cat. A)
Project Components	• Tree Plantation • Headquarter - Administrative building - Motorpool Building with Stand-by Diesel Power Generator - Nursery Area with 1 Multi-purpose Building - Main Gate Security Bldg. - Perimeter Fence - Water System with Pump House and Overhead Tank • Logging Roads • Protected area • Buffer zone	• Tree Plantation • Headquarter - Administrative building - Motorpool Building with Stand-by Diesel Power Generator - Main Gate Security Bldg. - Perimeter Fence - Water System with Pump House and Overhead Tank - Parking Area • Nurseries • Logging Road • Protection/Conservation Area



Project site within the CADT R13-BIS-0408-070

Project Components

4 The five major components of the project described in the approved ECC are the: a) tree plantation, b) headquarter, and c) logging road, (d) protected area and (e) buffer zone.

5 Proposed modification of the components shall cover: a) tree plantation, b) headquarter, c) nursery, d) logging road, and e) protection/conservation area, as summarized in a matrix in the succeeding table.

Project Components Matrix

Project Components/ Facilities	Existing (ECC-R13-2106-005)	Proposed Changes for the Amendment	
	Area Allocation (m^2 or has.)		Specification / Description
1. Tree Plantation	9,325 hectares	9,325 hectares	The planting intensity up to 4,444 trees per hectare at 1.5 X 1.5 meters to 3 X 3 meters spacing will be done, subject to area conditions and optimization during operations. These trees will be planted in the area identified by LEPI and MMADMC as production forest areas. Protected areas such as sacred grounds, old secondary forest, buffer areas, and those considered as protection zone will be separated for protection and conservation. Assisted natural regeneration including enrichment planting of native tree species will be done. The cycle or rotation period is three (3) years from planting. The management will be conducted together with the Indigenous People for the next twenty-four (24) years or more based on the contract
2. Headquarter	8.04 hectares	27.79 hectares	This will be the center for the project administrative, maintenance, demonstration and recreational, and logistical operations.
3. Nurseries	*Subcomponent of Headquarter: 3.00 hectares with 600 sq. m. building*	31.57 hectares	The nursery seedlings production center will have one main central nursery and four (4) satellite nurseries spread over the project area with total seedling capacity of approximately 25.8 million seedlings.
4. Logging Roads	54.93 hectares (102.52 km)	57.19 hectares (97.96 km)	These roads will be for logs, seedlings, equipment and personnel transport
5. Protection / Conservation Area	2,330.63 hectares (Protected Area) 126.83 hectares (Buffer Zone)	1,065.56 hectares	This includes all inland water with 40-meter buffer zone, conservation areas, slope class, and CADT protected areas.
Total Project Area	**11,845.43**	**10,507.11**	

Process Technology

Technology description

6 The management of the plantation will be done by block method because the area is composed of harvestable trees from the previous concessionaire. The identified plantable blocks will be subjected to the standard planting and cycle.

7 Plantation management is broadly divided into nine management phases: a) Planting Site Survey and Delineation, b) Selection of Species for Planting, c) Nursery Establishment/ Planting Stock Production, d) Planting Site Preparation, e) Transport of Planting Materials, f) Planting g) Protection and Maintenance h)Harvesting, i) Log transportation/storage and an additional Scalling and weighing of produce. The brief descriptions of the management schemes are shown in the succeeding paragraphs.

1. Planting site survey and delineation - The survey aims to provide a general layout of the area, assess vegetation and soil conditions, and determine boundaries. The delineation using GIS will identify

production areas, separate protection areas identified by Indigenous People, and divide the area into manageable blocks. The outcome will show current infrastructure, proposed nursery sites and future developments, and roads for better balance and sustainability.

2. Selection and sourcing of species for planting - Acacia mangium is a species of tree that is well adapted to the Philippines for reforestation and rehabilitation purposes, according to reports and studies. It is an evergreen, fast-growing tropical tree that can grow up to 30 m tall and 50 cm thick. The tree is native to Indonesia, Papua New Guinea, and Australia. Still, it has been introduced to other countries for use as a plantation tree due to its rapid growth and tolerance to poor soil. A. mangium has a variety of uses, including furniture, cabinets, turnery, floors, particleboard, plywood, veneer, fence posts, firewood, and charcoal. It is also used in pulp and paper making because of its good pulp traits. The suitability of A. mangium to the site conditions of the Philippines was determined based on soil, climate, elevation, and slope, and the seeds will be sourced locally.
3. Nursery establishment and planting stock production - The plan is to establish nurseries for producing planting stock, including a central nursery and satellite nurseries near the plantations to easily transport seedlings. In case of a seedling shortage, local procurement may be used.
4. Preparation of the planting site - The preparation of planting sites includes clearing and cultivation activities such as brushing, clearing, marking, staking, and hole digging. Unwanted vegetation and weeds will be removed using tools like bolo and scythe. Rocks that may affect seedling growth will be removed, and soil will be loosened if necessary. The spacing between seedlings will be 1.5m x 1.5m to 3m x 3m to maximize tree density and wood yield and will be adjusted based on existing plants, rocks, and other obstacles. Staking and hole digging will be done to accommodate the roots of the seedlings and fertilizer. The area used is suitable for Acacia mangium, and no site amelioration is needed. Seedlings will be planted in contour lines on slopes and straight lines on flat areas, and organic fertilizer and pesticides will be used for their production and growth.
5. Transport of planting materials - Proper hauling of the seedlings to plantation site is necessary because seedling transport is critical to its survival. Watering the seedlings before loading may help. Seedlings should be handled on the container, not the stem, to avoid damage.
6. Planting - Planting for the LEPI plantation can be done year-round due to the climate and organic and soil-based bio-fertilizers will be applied to improve soil. Seedlings will be planted with the ball of soil on the same level as the ground, stabilized with topsoil and subsoil, and surrounded by a shallow catchment to retain moisture. The plantation of LEPI is a short-rotation forestry/plantation, and the target area is 9,325 hectares to be developed in three years, with a target of 3,108 hectares per year. The company will adopt high-density planting with 1.5 X 1.5 meters to 3 X 3 meters spacing or up to 4,444 trees per hectare for maximum yield, with an expected 300 tons per hectare at 50% moisture content.
7. Protection and maintenance - The maintenance phase of a plantation involves various silvicultural activities, such as fire protection, replanting, weeding, pruning, and thinning. Management treatments vary between blocks and may not always require thinning or pruning.
8. Harvesting - Manual harvesting will be used for cutting trees in the plantation and will provide job opportunities for the community. It is preferred over mechanical harvesting because it has a lower environmental impact, as part of a short rotation woody crop plantation scheme.
9. Log Transport/Hauling - All wood harvested from the plantation will be loaded mechanically on haulers along the road. Woods that will be gathered are smaller in diameter and length than timber; hence hauler trucks will be configured to accommodate the woody crops.
10. Scaling and Weighing - Harvested wood will be scaled and weighed at the mill site for documentation purposes and to monitor the production performance of the plantation. A standard scale and weighing method will be used in compliance with the law on tree harvesting and to determine the actual yield of the plantation

Operation

8 The project will operate with a cycle or rotation period of three years from planting. The management will be conducted with the Indigenous People for the next 24 years or more based on the contract. The intensity of planting is 4,444 trees per hectare. The *Acacia mangium* will be planted in areas identified by the LEPI and MMADMC as production forests. Areas such as existing NGP sites, sacred grounds, steep slopes, and elevation are within the protected area for assisted regeneration.

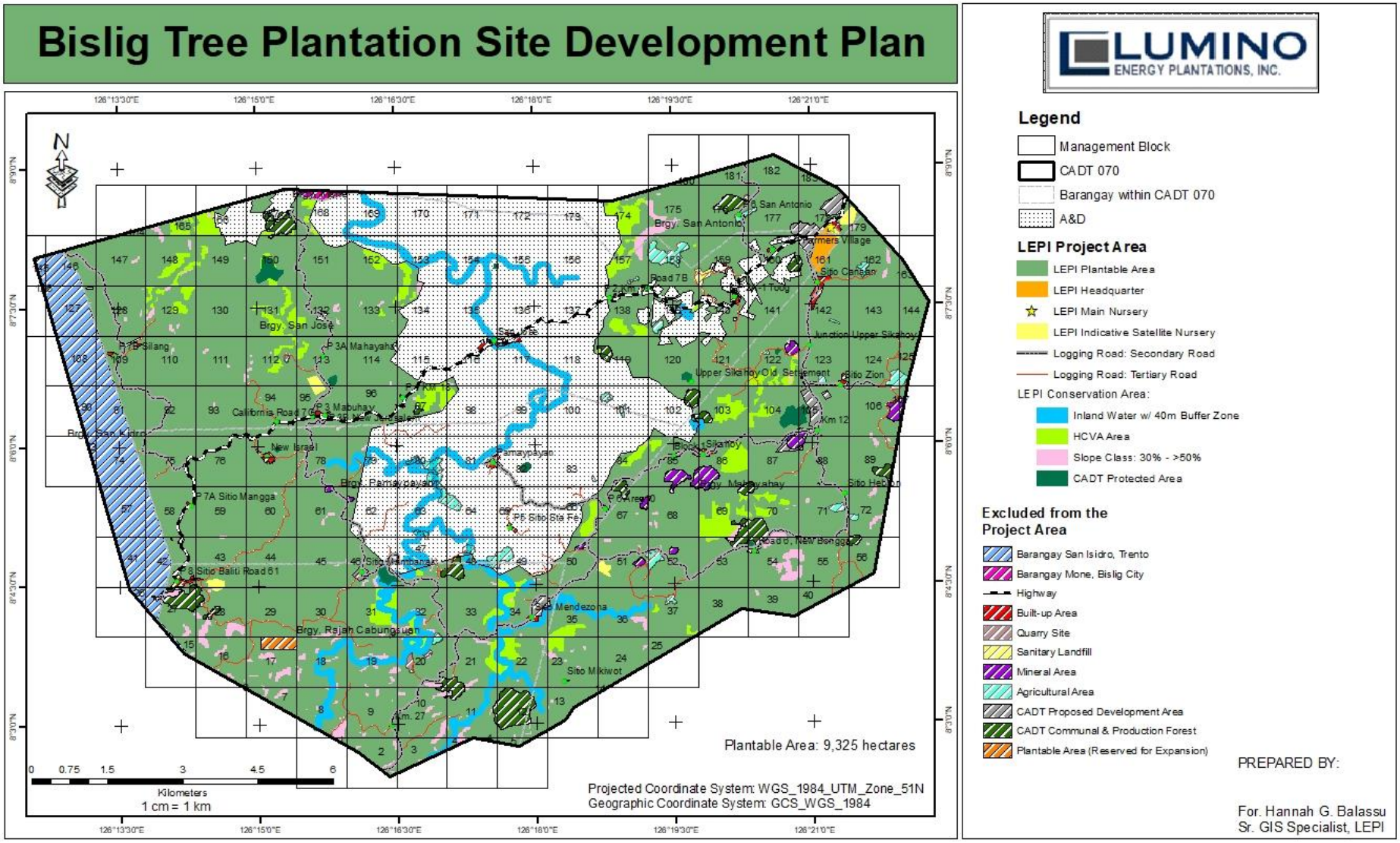
9 The newly developed plantations shall be harvested when they reach their rotation period of three years or earlier, depending on the end-use of the product. All harvested products shall be hauled, transported, and delivered to the company's log yard to be established and located near the project area and access roads. The harvesting and transport of trees plantation inside the CADT area will be in accordance with the approved

Ancestral Domains Sustainable Development and Protection Plan (ADSDPP) and existing laws, rules, and regulations of the NCIP and DENR.

Project Development Timeline

No.	Development	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10 - Year 21
		J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D
1	Division 1 (3,146.09 ha.)										*continuing harvest and plant management cycle*
2	Division 2 (3,195.37 ha.)										
3	Division 3 (2,973.55 ha.)										
	Total: 9,315.01 hectares										

Legend:	
Road Network Construction/ Repair/Rehabilitation/Maintenance	
Nursery Establishment & Seedlings Production	
Plantation Establishment	
Tree Maintenance and Protection	
Tree Plantation Harvesting (3-Year old from starting month of planting)	



Bislig Tree Plantation Site Development Plan

Summary of Alternatives Considered in terms of Siting, Technology Selection/Operation Processes and Design

Category	Considerations
Siting Project Location	The proponent considered the approved CADT areas in Region 13 and Region 11 for siting of the project during the pre-feasibility stage. CADT R13-Bis-0408-070 with a 15,431.95-hectare ancestral domain area in Bislig City and Municipality of Lingig was selected.
Tree Plantation	The main criterion for delineating the project area within the 15,431.95-hectare CADT R13-Bis-0408-070 is the non-inclusion of the CADT area portions under continuing negotiation with the IPs and the exclusion of Alienable and Disposable lands.
Headquarter and support facilities	To be developed within a flat and rolling terrain. The criteria for selecting the site are cost, time efficiency construction, and operation requirements.
Logging Roads	The existing barangay roads are all-weather roads but with light or heavy damages. These access roads (97.96 km) will be rehabilitated before used as logging roads with area coverage of 57.19 hectares. Their maintenance during operation phase will provide better road transport of the public as well.
Protection / conservation area	Includes all inland water with 40-meter buffer zone, conservation areas, slope class, and CADT protected areas.
Nursery	The nursery seedlings production center with a coverage of 31.57 hectares will have one main central nursery and four (4) satellite nurseries spread over the project area with total seedling capacity of approximately 25.8 million seedlings.
Technology selection	Tree plantation establishment is broadly divided into three management phases: (a) seedlings production and nursery maintenance, (b) plantation establishment and management, and (c) tree cutting and transport. The plantation management phase includes the following silvicultural activities: protection, tending (weeding and fertilizing), pruning, thinning, felling and regeneration/replanting. This management technology is standard to the Philippine wood industry particularly for large-scale industrial forest plantation. Hence, no other technologies including the tree felling and cutting and transport were considered.
Resources	Resources needed for project implementation are available at the site, e.g., access to power, road network, water supply, solid waste collection, among others.
Hazard contextualization	The project site is safe from most natural hazard but has a low susceptibility to rain-induced landslides.
No Project Option	The impacts during project implementation will not be observed at the “no Project” scenario. Other impacts however, e.g., deforestation due to population increases and the absence of economic growth may occur if the project will not push through.

Concise Integrated Summary of the Main Impacts and Residual Effects after Applying Mitigation

10 The concise integrated summary of the main impacts and residual effects after mitigation is presented in a table the following page.

Project Proponent’s Statement of Commitment and Capability to Implement Necessary Measures to Prevent Adverse Impacts

11 Lumino Energy Plantations Inc. commits to following the guidelines outlined in the Environmental Management Plan (EMP), Environmental Monitoring Plan (EMoP), and Environmental Compliance Certificate (ECC) during all phases of the project. We take our environmental responsibilities seriously and are dedicated to ensuring that all measures taken to address potential impacts are in accordance with relevant laws, policies, guidelines, and standards. Our goal is to meet the target level of efficiency and performance outlined in the EMP to guarantee that the protective and mitigating measures we implement are adequate and meet the project's requirements.

Integrated Summary of the Main Impacts and Residual Effects After Mitigation

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention, Mitigation or Enhancement	Target Efficiency	Residual Effects
PRE-CONSTRUCTION PHASE					
Due diligence	(LAND) Land use and classification	• Compatibility with existing land use	• Confirm classification of the other project areas to the zoning regulation of Bislig City • Confirm existence of NGP areas within the project site with DENR CENRO	Confirm 100% of the Project Areas zoning regulations and nearest areas for NGP.	Issuance of the Zoning Clearance NGP overlap issues resolved
	(LAND) Pedology	• Soil erosion, loss of topsoil and overburden	• Formulate a Soil Erosion Management Plan (SEMP) that includes among others minimized cut and fill operations and Immediate removal of excavated soil stockpiles	100% Formulation of Soil Erosion Plan	Soil erosion controlled and minimized
	PEOPLE	• Displacement of land and conflict in land ownership	• Compliance to NCIP regulation as authority over project area •	100% Completion of Pre Conditions of the NCIP Certificate	-
	PEOPLE	• Traffic congestion	• Prepare a workable Traffic Management Plan (TMP) at all affected public roads	100% completion of Traffic Management Plan	-
Land acquisition	(LAND) Land use and classification	• Possible tenurial/ land issue	• Ensure authority to develop the project site	Securing 100% of land titles	Land issues resolved
Design of the project components	(LAND) Land use and classification	• Encroachment in Environmentally Critical Areas (ECA)	• Include susceptibility of the project site to geo- and hydrological hazards in the detailed design	Continuous Monitoring conducted	-
	(LAND) Geology – Impacts of the project	• Change in sub-surface and underground geomorphology • Inducement of geo-hazards	• Conduct Geotechnical Investigation and EGGA and consider its recommendations	100% Completion of EGGA Activities and implementation of recommendations	Unnecessary changes in surface landform, sub-surface geomorphology, and inducement of geohazards minimized
		• Geo-, hydrological, and meteorological hazards	• Consider recommendations of the GIR and EGGAR and use industry standards for seismic and structural design parameters	100% Completion of EGGA Activities and implementation of recommendations	Susceptibility of the Project components from geo- and hydrological hazards minimized
Design of the project components	(LAND) Terrestrial biology	• Impacts on terrestrial flora and fauna	• Conduct a complete census of flora to determine the total count of affected trees and other arborescent taxa;	100% compliance to Tree Cutting Permit requirements	Impacts to terrestrial ecology controlled and minimized

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention, Mitigation or Enhancement	Target Efficiency	Residual Effects
			• Consider the locations of significant vegetation types and populations during project design; • Secure a Tree Cutting Permit from the DENR; • Prepare a Construction Vegetation Removal Plan (CVRP); • Prepare a Construction Vegetation and Tree Planting Program (CVTPP); • Prepare a Buffer Zone Plan (BZP); • Prepare a Tree Transfer and Balling Plan (TTBP) for affected mature trees. • Prepare a Tree Survival and Monitoring Plan (TSMP); • Prepare a Vegetation and Tree Planting Program during Operations (VTPPO) • Prepare a Biodiversity Conservation Plan (BCP); and • Prepare a Wildlife Monitoring Plan (WMP)		
CONSTRUCTION PHASE					
• Site clearing and preparation • Construction of utilities (road, drainage, water supply, septic vaults) • Erection of headquarter	(LAND) Land use and classification	• Impairment of visual aesthetics	• Proper implementation of the Buffer Zone Plan (BZP)	100% Completion and implementation of Buffer Zone Plan	Issuance of the Zoning Clearance NGP overlap issues resolved
		• Devaluation of land value as a result of improper solid waste management	• Proper implementation of the Construction Plan and CWMP	100% Completion of the Construction Plan and CWMP	Insignificant devaluation of land value due to improper solid waste management
	(LAND) Geology	• Change in sub-surface geomorphology • Inducement of subsidence and liquefaction	• Proper implementation of the Construction Plan	100% Completion of the Construction Plan and CWMP, and Continuous Monitoring of its implementation.	Unnecessary changes in surface landform, sub-surface geomorphology, and inducement of geohazards minimized

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention, Mitigation or Enhancement	Target Efficiency	Residual Effects
		• Effects of geo- and hydrological hazards	• Proper implementation of the Construction Plan	100% Completion of the Construction Plan and CWMP	Susceptibility of the Project components from geo- and hydrological hazards minimized
	(LAND) Pedology	• Soil erosion or loss of topsoil	• Proper implementation of the Construction Plan • Proper implementation of the SEMP	100% Completion of the SEMP and its implementation	Soil erosion controlled and minimized
		• Change in soil quality/fertility	• Further study on soil fertility and micronutrient requirements of the tree species for planting • Formulate a Soil Fertility Augmentation Plan (SFAP) • Proper implementation of the Construction Plan • Provide oil sumps in machine repair shops • Proper storage and disposal of used oil and other hazardous wastes	Continuous Monitoring of Soil Quality Continuous implementation of Solid waste management plans	Changes in existing soil quality and fertility controlled and minimized
	(LAND) Terrestrial ecology	• Vegetation removal and loss of habitat • Threat to existence of important local species, abundance, frequency and distribution of important species • Hindrance to wildlife access.	• Proper implementation of the Construction Plan • Proper implementation of the CVRP, CVTPP, BZP, TTBP, and Tree Cutting Permit conditions • Strict implementation of a "*No Hunting and No Collecting*" policy • Minimize hindering the flow of streams at the project area. • Limit the development activities within the planned structure or component footprint.	100% Completion of Construction Plan and continuous monitoring of its implementation. 100% Acquisition of Necessary permits and licenses. 100% implementation of Plans mentioned	Impacts to terrestrial ecology controlled and minimized
	(WATER) Hydrology	• Change in drainage morphology • Inducement of flooding	• Provide temporary drainage system • Provide detention ponds in the immediate drainage outlet to maintain the peak runoff • Formulate a Flood Management Plan (FMP) for the operation phase	100% Completion of Flood Management Plan.	Minimized changes in the existing drainage morphology

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention, Mitigation or Enhancement	Target Efficiency	Residual Effects
	(WATER) Water quality	• Degradation of surface water quality	• Housekeeping practices • Provide onsite sanitary facilities • Provide adequate drainage leading to siltation ponds	Continuous Monitoring of Water quality	Water pollution of waterbodies controlled and minimized
	(WATER) Freshwater ecology	• Impact to freshwater biodiversity	• Proper implementation of the SEMP • Provide cover, bunds, and drainage canal leading to silt ponds for stockpiles • Proper implementation of the CWMP • Provide onsite sanitation facilities • Provide cover on vehicles carrying construction materials • Formulate and implement protocols to address gasoline and oil spills from boats (if used during construction) using the Bislig River.	100% Completion of the SEMP and its implementation Continuous Monitoring of Water Quality	Impacts to the freshwater ecology controlled and minimized
	(AIR) Meteorology	• Contribution in terms of greenhouse gas emissions	• Regular and proper maintenance of motor vehicles and heavy equipment • Optimize schedule of vehicle use • Regular and proper maintenance of onsite power generators	Continuous monitoring of the implementation of Maintenance of heavy equipment both internally and from contractors	Insignificant greenhouse gas emissions
	(AIR) Air quality	• Degradation of air quality	• Implement dust suppression methods, e.g., water application and vehicle speed restriction • Optimize the use of heavy equipment and motor vehicles • Compacting of exposed soil surfaces • Provide tarpaulin cover on trucks loaded with construction materials • Regular maintenance of heavy equipment and motor vehicles • Regular maintenance of standby generator • Prohibit engine idling in parking areas	Continuous Implementation of dust preventing practices 100% implementation of Pollution Management Measures.	Air pollution controlled and minimized
	(AIR) Noise	• Noise pollution	• Provide and maintain mufflers of gasoline or diesel engines powered equipment	Continuous monitoring of Construction Plan	Excessive noise levels attenuated

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention, Mitigation or Enhancement	Target Efficiency	Residual Effects
			• Establish barriers and shielding stationary vibrating equipment		
	PEOPLE	• In-migration	• Monitor arrival of informal dwellers within the project area	100% completion and implementation of Construction plan including its development of Tempfacil..	In-migration controlled and addressed
		• Impacts on IPs/Culture/Lifestyle	• Proper orientation of migrant workers on culture of IP groups	100% Completion of NCIP Requirements	Impacts on IP group, culture, and lifestyle minimized
		• Impacts on physical cultural resources	• Report chance finds to National Museum	100% Turnover of any found cultural resources.	Physical cultural resources preserved
		• Threat to public health and safety	• Contractor's vaccination plans and to sustain the minimum health protocols in conformance with the national and local guidelines • Regular and proper maintenance of heavy equipment and vehicles • Proper implementation of the CWMP • Proper implementation of the Construction Plan	100% Creation and Implementation of Safety Process and Procedures, including but not limited to wearing PPEs, CoViD-19 related measures. 100% of Contractors submitting Safety and Health Management Plans.	Threat to public health and safety controlled and minimized
		• Generation of local benefits from the project (BENEFICIAL IMPACT)	• Prioritize hiring of qualified residents from the host barangays • Purchase supplies from local sources • Provide livelihood opportunities if possible • Prompt payment of taxes and other legal fees	100% completion of SDMP	Local benefits from the project maximized
		Threat to delivery of basic services and resource competition	• Monitor arrival of informal dwellers within the project area	Monitoring of migrating applicants	Threat to delivery of basic services and resource competition controlled and minimized
		Traffic contribution along impact roads	• Implement the Traffic Management Plan	100% completion and implementation of traffic Management Plan	Traffic congestion and accidents controlled and minimized

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention, Mitigation or Enhancement	Target Efficiency	Residual Effects
OPERATION PHASE					
Administrative Works	PEOPLE	Generation of local benefits from the project (BENEFICIAL IMPACT)	• Prioritize hiring of qualified residents from host barangay • Purchase supplies from local sources • Provide livelihood opportunities • Prompt payment of fees and taxes	100% implementation of SDMP	Local benefits from the project maximized
Nursery Operation & Tree Planting	(LAND) Land use and classification	Impairment of visual aesthetics	• Sustained implementation of the BZP	100% implementation of BZP	Minimal impairment of visual aesthetics
		Devaluation of land value as a result of improper solid waste management	• Proper implementation of the IWMP • Best housekeeping practices	100% implementation of IWMP	Insignificant devaluation of land value due to improper solid waste management
		Effects of geo- and hydrological hazards	• Undertake assessment of slope protection measures after heavy rain or seismic events • Maintain drainage system • Regular inspection of structure integrity	All assessments undertaken and necessary actions implemented	Susceptibility of the Project components from geo- and hydrological hazards minimized
	(LAND) Pedology	Soil contamination by municipal and hazardous waste	• Proper implementation of the IWMP • Best housekeeping practices	100% implementation of IWMP	Soil contamination controlled and minimized
		Soil erosion	• Sustained implementation of the SEMP	100% implementation of SEMP	Soil erosion controlled and minimized
	(LAND) Terrestrial ecology	• Vegetation removal • Threat to existence of important indigenous species • Threat to Abundance, Frequency, and Distribution of Important Species • Hindrance to Wildlife Access (avifauna)	• Sustained implementation of the Buffer Zone Plan • Proper Implementation of the Tree Survival and Monitoring Plan • Proper Implementation of the Vegetation and Tree Planting Program during Operations • Sustained implementation of the Biodiversity Conservation Plan (BCP) • Proper Implementation of the Wildlife Monitoring Plan (WMP)	100% implementation of Plans mentioned	Impacts to terrestrial ecology controlled and minimized
	(WATER) Freshwater ecology	• Impact to freshwater biodiversity	• Sustained implementation of the SEMP	100% implementation of SEMP	Impacts to the freshwater ecology

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention, Mitigation or Enhancement	Target Efficiency	Residual Effects
			• Proper implementation of the IWMP • Provide onsite sanitation facilities • Sustained implementation of protocols to address gasoline and oil spills from boats (if used during operation) using the Bislig River.		controlled and minimized
Plantation Protection and Maintenance Operations	(LAND) Pedology	• Soil contamination by municipal and hazardous wastes	• Proper implementation of the IWMP • Best housekeeping practices	100% implementation of IWMP	Soil contamination controlled and minimized
		• Soil erosion	• Sustained implementation of the SEMP	100% implementation of SEMP	Soil erosion controlled and minimized
	(LAND) Terrestrial ecology	• Vegetation removal • Threat to existence of important indigenous species • Threat to Abundance, Frequency, and Distribution of Important Species • Hindrance to Wildlife Access (avifauna)	• Sustained implementation of the Buffer Zone Plan • Proper Implementation of the Tree Survival and Monitoring Plan • Proper Implementation of the Vegetation and Tree Planting Program during Operations • Sustained implementation of the Biodiversity Conservation Plan (BCP) • Proper Implementation of the Wildlife Monitoring Plan (WMP)	100% implementation of Plans mentioned	Impacts to terrestrial ecology controlled and minimized
Harvesting	(LAND) Terrestrial ecology	• Vegetation removal and loss of habitat • Threat to existence of important local species, abundance, frequency and distribution of important species • Hindrance to wildlife access.	• Sustained implementation of the Buffer Zone Plan • Proper Implementation of the Tree Survival and Monitoring Plan • Proper Implementation of the Vegetation and Tree Planting Program during Operations • Sustained implementation of the Biodiversity Conservation Plan (BCP) • Proper Implementation of the Wildlife Monitoring Plan (WMP)	100% implementation of Plans mentioned	Impacts to terrestrial ecology controlled and minimized
	(WATER) Hydrology	• Change in drainage morphology • Inducement of flooding • Increase in run-off	• Provide temporary drainage system • Provide detention ponds in the immediate drainage outlet to maintain the peak runoff	100% implementation of FMP	Flooding and run-offs minimized

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention, Mitigation or Enhancement	Target Efficiency	Residual Effects
			• Formulate a Flood Management Plan (FMP) for the operation phase		
	(WATER) Water quality	• Vegetation removal may have potential impact on siltation • Degradation of surface water quality	• Best housekeeping practices • Provision of sanitation facilities • Maintain drainage system leading to siltation ponds • Monitor water quality affected portions of the Bislig River	100% implementation of drainage plan	Water pollution of waterbodies controlled and minimized
	(WATER) Freshwater ecology	• Impact to freshwater biodiversity	• Sustained implementation of the SEMP • Proper implementation of the IWMP • Provide onsite sanitation facilities • Sustained implementation of protocols to address gasoline and oil spills from boats (if used during operation) using the Bislig River.	100% compliance to SEMP.	Impacts to the freshwater ecology controlled and minimized
	(AIR) Meteorology	• Contribution in terms of greenhouse gas emissions	• Regular maintenance of standby generator(s) • Optimize use of motor vehicles • Prohibit engine idling in parking areas	• 100% implementation of necessary equipment maintenance and usage of Pollution control devices on applicable equipment • 100% implementation of tree planting and reforestation plans	Insignificant greenhouse gas emissions
	(AIR) Air quality	• Degradation of air quality	• Implement dust suppression methods, e.g., water application and vehicle speed restriction • Optimize the use of off-road equipment equipment and motor vehicles • Compacting of exposed soil surfaces • Provide tarpaulin cover on trucks loaded with logs • Regular maintenance of off-road equipment equipment and motor vehicles	100% implementation of necessary equipment maintenance and usage of Pollution control devices on applicable equipment	Air pollution controlled and minimized

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention, Mitigation or Enhancement	Target Efficiency	Residual Effects
			• Prohibit engine idling in parking areas		
	(AIR) Noise	• Noise pollution	• Regular maintenance of off-road equipment • Maintain vegetated buffer along the perimeter	Continuous Monitoring of noise level in the project site.	Excessive noise levels attenuated
	(PEOPLE)	• Threat to public health and safety	• LEPI's vaccination plans and to sustain the minimum health protocols in conformance with the national and local guidelines • Provide onsite sanitation facilities • Regular and proper maintenance of vehicles • Proper operation and maintenance of sanitary facilities • Proper implementation of the IWMP	100% implementation of healtj and safety management plan.	Threat to public health and safety controlled and minimized
Log Storage and Transportation and Road Maintenance	(LAND) Pedology	• Soil erosion	• Sustained implementation of the SEMP	100% implementation of IWMP	Soil contamination controlled and minimized
		• Soil Compaction	• Sustained implementation of the SEMP	100% implementation of SEMP	Soil erosion controlled and minimized
	(AIR) Meteorology	• Contribution in terms of greenhouse gas emissions	• Optimize use of heavy vehicles • Prohibit engine idling in parking areas	• 100% implementation of necessary equipment maintenance and usage of Pollution control devices on applicable equipment • 100% implementation of tree planting and reforestation plans	Insignificant greenhouse gas emissions
	(AIR) Air quality	• Degradation of air quality	• Implement dust suppression methods, e.g., water application and vehicle speed restriction • Optimize the use of heavy equipment and motor vehicles • Compacting of exposed soil surfaces • Provide tarpaulin cover on trucks loaded with logs	• 100% implementation of necessary equipment maintenance and usage of Pollution control devices on applicable equipment	Air pollution controlled and minimized

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention, Mitigation or Enhancement	Target Efficiency	Residual Effects
			• Regular maintenance of heavy equipment and motor vehicles • Prohibit engine idling in parking areas		
	(AIR) Noise	• Noise pollution	• Maintenance of heavy equipment • Maintain vegetated buffer along the perimeter	Continuous Monitoring of noise level in the project site.	Excessive noise levels attenuated
	(PEOPLE)	• Threat to public health and safety	• LEPI's vaccination plans and to sustain the minimum health protocols in conformance with the national and local guidelines • Provide onsite sanitation facilities • Regular and proper maintenance of vehicles • Proper operation and maintenance of sanitary facilities • Proper implementation of the Traffic Management Plan • Proper implementation of the IWMP	100% implementation of health and safety management plan.	Threat to public health and safety controlled and minimized
		• Traffic congestion	• Proper implementation of the Traffic Management Plan	100% implementation of Traffic Management Plan	Traffic congestion and accidents controlled and minimized
ABANDONMENT / REHABILITATION PHASE					
Administrative Works	(PEOPLE)	• Possible loss of employment • Loss of livelihood	• Series of consultations with stakeholders before implementation of abandonment for proper turn-over of constructed facilities and structures	100% of stake holders representatives involved 100% implementation of Abandonment and Rehabilitation Plans	Local benefits from the project maximized
Rehabilitation/ Restoration	(LAND)	• Land use change			