Environment Social Management Plan/Public Environment Report (PER)

Dala Solar Hybrid Subproject

February 2021

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ACRONYMS

AP	Affected Person
BMP	Building Materials Permit
BOQ	Bill of Quantities (BOQ)
CESMP	Construction Environment Social Management Plan
CITES	Convention on International Trade in Endangered Species
ECD	Environment Conservation Division
EIA	Environment Impact Assessment
EIS	Environment Impact Statement
EMP	Environment Management Plan
EPC	Engineering Procurement Construction Contract
ERW	Explosive Remnants of War
ESIA	Environment Social Impact Assessment
ESMP	Environment Social Management Plan
ESO	Environment Safety Officer
GEF	Global Environment Facility
GRM	Grievances Redress Mechanism
IDA	International Development Association
MECDM	Ministry of Environment, Climate Change, Disaster Management and Meteorology
MID	Ministry of Infrastructure Development
MLHS	Ministry of Housing Lands and Survey
MMERE	Ministry of Mines Energy Rural Electrification
MPG	Malaita Provincial Government
NAPA	National Adaptation Plan of Action
NEMS	National Environment Management Strategy
PER	Public Environment Report
RSIPF	Royal Solomon Islands Police Force
SDA	Seventh Day Adventist
SICA	Solomon Islands Christian Association
SIDS DOCK	Strategic Climate Fund and Small Islands Development State Initiative Multi-Donor Trust Fund
SIEA	Solomon Islands Electricity Authority
SIEAREEP	Solomon Islands Electricity Access and Renewal Energy Expansion Project
SIG	Solomon Islands Government
SINDS	Solomon Islands National Development Strategy 2011-2020
SINEP	Solomon Islands National Energy Policy 2014-2024
SIWA	Solomon Islands Water Authority
SOP	Standard Operating Procedures
SP	Solomon Power
SSEC	South Sea Evangelical Church
TCPB	Town Country Planning Board
UXO	Unexploded Ordnance
WB	World Bank

EXECUTIVE SUMMARY

Solomon Islands Electricity Authority (SIEA) trading as Solomon Power (SP) established under the Electricity Act 1969 is the sole provider of grid electricity throughout Solomon Islands. Within Honiara itself, it has two power stations (where more than 95% of the energy is from diesel generators) located at Lungga and Honiara producing a combined capacity of 32MW. Development partners over the last 10years have provided financial assistance to Solomon Power (SP) in its efforts to meet obligations under the Solomon Islands National Energy Policy 2014-2024 (SINEP).

Recently, World Bank (WB), Global Environment Facility (GEF), Strategic Climate Fund and Small Islands Development State Initiative Multi-Donor Trust Fund (SIDS DOCK) have agreed to finance capital works under the Solomon Islands Electricity Access and Renewal Energy Expansion Project (SIEAREEP). The SIEAREEP comprise of International Development Association (IDA) Credit 5.55m, IDA Grant 4.75m), and trust funds (Strategic Climate Fund 7.1m, GEF Grant 0.9m and SIDS DOCK grant 1.6m). The project development objective is to increase access to grid-supplied electricity and increase renewable energy generation in Solomon Islands. SP will therefore utilize this funding to increase its footprint throughout Solomon Islands through service connection subsidies and the expansion of solar farms at Henderson and Roof top of SP building together with Solar Hybrid systems and to increase the share of renewable energy from its current and proposed power stations. The project is divided into three (3) components:

- Component 1: Involve installation of new hybrid mini-grids in key locations within Solomon Islands.

- Component 2: Involve new electricity service connections and subsidies for household wiring for low-income households accessing electricity services connecting to the mini-grids to be built under Component 1, and others across Solomon Power's grid network.

- Component 3: Involve the installation of between 0.5MW and 2.5MW of solar (PV) generation to be connected to the existing grid on Guadalcanal and/or Malaita islands.

Planning and designs of the subprojects are underway by SP Engineers. The completion of the SIEAREEP project in the next five (5) years will go a long way in promoting the use of clean energy with minimal effects on the environment.

Component	Description
Generator	132 kW Generator
PV	496 kWp Solar Panel string inverters
Storage	5 x Tesla Battery & Inverters (50kW, 228kWh each)

System component for Dala Solar Hybrid, SP Planning report, 2020.

The Dala Solar Hybrid is a subproject under component 1. Construction activities for the solar hybrid will be restricted to creating a driveway onto the site, removal of vegetation from the site, installing foundations for the solar arrays, erection of a secure building to house storage batteries, a diesel generator for generation backup and other ancillary equipment, installing

the solar arrays and controllers, and installing of security fencing. Construction of the distribution grid will involve excavating holes for placement of power poles alongside existing roads and tracks, erecting the poles, stringing the power wires, and establishing the electrical connections to existing buildings.

In the Solomon Islands, Solar Hybrid development is a prescribed development classified under Public Works Sector. This means it requires a Public Environment Report (PER) or an Environment Impact Statement. For this subproject, the screening exercise by ECD determined it to be a PER.

The WB Policy has been triggered for this subproject[1]. As a result, an Environment Social Management Plan is required. This is to comply with the SP Environment Social Management Framework (ESMF) for the SIEAREEP. The ESMF outlines the procedures and requirements for environmental and social safeguards.

This ESMP/PER document the environmental social impacts associated with the Dala solar farm subproject. It is envisaged the subproject impacts will be minor and can be satisfactorily mitigated and managed at acceptable levels. All impacts and activities are addressed by an environmental social management plan in chapter six.

A Grievances Redress Mechanism (GRM) was also developed for the subproject because it is possible that people may have concerns with the subproject's environmental performance including the implementation of the ESMP. Common complaints arising during construction expected to be minor, concerning noise, dust and health and safety issues that can be promptly addressed and resolved.

The ESMP/PER concludes that majority of the environmental and social impacts are minor and marginal, all of which can be satisfactorily managed and mitigated. There is no need for further studies or an EIS.

[1] SIEAREEP is the project, subproject are referred to as individual sites where specific works are to be delivered.

1.0 INTRODUCTION

1.1. Subproject Background

The growing need for electrification in the Solomon Islands has increased significantly both in urban, semi-urban and rural communities. Following this need, the Solomon Islands Government (SIG) through the Ministry of Mines, Energy and Rural Electrification(MMERE) developed a National Energy Policy 2014-2024 (NEP) to guide the country in its efforts to provide electrification for the growing population by exploring opportunities in renewable energy sources.

SP, as the agency responsible for generation, transmission and distribution of electricity is a key figure in the realization of this strategic area of development. The company is embarking on Solar Hybrid subprojects to support its current supply grids and has taken steps to expand the initiative to semi-urban and rural communities. Recently, WB, GEF, Strategic Climate Fund and SIDS DOCK have agreed to finance capital works under the SIEAREEP. The SIEAREEP comprise of IDA Credit 5.55m, IDA Grant 4.75m), and trust funds (Strategic Climate Fund 7.1m, Global Environment Facility Grant 0.9m and Small Islands Developing States Initiative SIDS DOCK grant 1.6m).

The Dala Solar Hybrid is a subproject under component 1 of the SIEAREEP. Construction activities for the solar hybrid will be restricted to creating a driveway onto the site, removal of vegetation from the site, installing foundations for the solar arrays, erection of a secure building to house storage batteries, a diesel generator for generation backup and other ancillary equipment, installing the solar arrays and controllers, and installing of security fencing. Construction of the distribution grid will involve excavating holes for placement of power poles alongside existing roads and tracks, erecting the poles, stringing the power wires, and establishing the electrical connections to existing buildings. Based on the high-level concept design, the system will be comprised of PV 496kW, battery storage of 50kW and a 132kW backup diesel generator.

Dala is located on the western region of the Malaita Island, Malaita Province. It is approximately one hour by truck from Auki, the provincial capital. Malaita consist of a number of islands and are inhabited by mostly Melanesian. According to the provisional count released on January 2020 based on the recent 2019 census, the population of Malaita is 173, 347 people. The SP board issued approval for Dala proposed solar hybrid to become a subproject under SIEAREEP in 2016 after it has met all the technical, population and financial requirements.

WB Safeguards Policies and Solomon Islands Legislation for Environment were triggered for this subproject. As a result, SP is preparing an ESMP/PER to meet these policy and legislative requirements. The ESMP/PER will be submitted to both the WB and the Solomon Islands Government (SIG) for approval.

In Solomon Islands, Solar Hybrid installation is a prescribed development under public works, 2nd schedule of the Environment Act. SP is required to produce PERs and management plans for the subproject. PER's are undertaken for activities that are likely to have an impact on the environment and are subject to the decision of the national authority, the Environment Conservation Division (ECD) under the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM). The ESMP/PER will be approved by the Director ECD who will then issue a development consent for the subproject.

1.2. Scope and Objectives of the study

The main objective of this assessment is to identify the potential environmental and social impacts of the subproject and formulate recommendations to ensure that the proposed subproject takes into consideration appropriate measures to mitigate any adverse environmental and social impacts during construction, operation and decommissioning.

The assessment was undertaken in full compliance with the WB ESMF and the Solomon Islands environment impact assessment guideline. In addition, appropriate sectorial legal provisions relevant to such subproject have also been referred to for necessary considerations during the construction, operation and decommissioning of the subproject.

Specific objectives of the study include the following:

- Establish the environmental, social baseline conditions of the subproject area and review available information and data related to the subproject;
- Identify key areas for environmental and social concerns as well as the anticipated impacts associated with the subproject implementation;
- Establish a comprehensive environmental, social management plan covering the preconstruction, construction, operation phases and decommissioning of the subproject; and
- Preparation of an ESMP/PER and submission to WB and ECD for approval.

1.3. Report Structure

The PER consists of ten chapters: (Chapter 1) Introduction; (Chapter 2) Legal and Policy Framework; (Chapter 3) Description of Subproject; (Chapter 4) Description of Environment; (Chapter 5) Potential Impacts and Mitigation Measures; (Chapter 6) Analysis of Alternatives; (Chapter 7) Environment and Social Management Plan; (Chapter 8) Public Consultation and Participation and (Chapter 9) Grievance Redress Mechanism (10) Conclusion and Recommendation.

1.4. PER Methodology

The ESMP/PER assesses the potential negative impacts of the subproject on the biophysical, ecological and social environments. It suggests measures for addressing any potential impacts that may have been identified. A site visit to investigate the environmental and social parameters and associated impacts was conducted in June 2020.

The approach taken to develop this ESMP/PER include:

(i) A review of existing baseline data (climate, geology, soil, physiography and biological resources);

(ii) Consultation with stakeholders including the Malaita Provincial Government (MPG), MEMRE, MECDM and Affected Person (AP);

(iii) Identification of potential impacts based on the design and scope of work;

(iv) Identification of mitigation measures for potential impacts and

(v) Preparation of an ESMP matrix as part of the ESMP/PER.

2.0 LEGAL AND POLICY FRAMEWORK

2.1. Solomon Islands Legislations and Regulations

Environmental impact assessment in the Solomon Islands is provided for under the Environment Act of 1998 and the accompanying regulatory instrument, the Environment Regulation, 2008. The MECDM administer the Act and regulations. Refer to annex 2 for relevant Acts.

2.1.1. Environment Act 1998

The Environment Act covers all the environmental issues in Solomon Islands and makes provisions for conservation and protection of the environment and establishes the ECD. The Act provides for an integrated system of development control, environmental impact assessment (EIA) and pollution control. The Environment Act has considerable power by virtue of Article 4 (1) which states that in the event of a conflict between the Act and other Acts, the provisions of the Environment Act shall prevail.

As required in Part III of the Act, all developer who intends to carry out or are carrying out a 'prescribed development' activity must make an application for development consent together with the relevant EIA report and any other relevant information as may be required by the Director. The Director with responsible staff and government agency then reviews the application with the relevant EIA report and make a decision whether to grant or not to grant development consent. The developer shall not commence operation or continue to carry out any prescribe development unless it has complied with relevant provisions of the Act, been issued a 'development consent' or the Director has exempted the development from relevant approval requirements.

2.1.2. Environment Regulation 2008

The Environment Regulations 2008 covers detailed requirements for EIA. The Act has a schedule which lists all "prescribed' developments' that need to undergo the EIA process. All prescribed developments require a simple assessment through "screening" or "scoping" process to see what form of additional assessment is required. Most development projects require a PER, while many major projects will also need a second stage of appraisal which include technical, economic, environmental and social investigations presented in an EIA or environmental impact statement (EIS) report. Forms 1 and 3 are relevant forms in the second schedule of the environmental regulation that provides guidelines to assist in the preparation and drafting of the EIS/PER. This ESMP/PER report is a commitment by SP to fully comply with the environmental regulation and Act.

2.1.3 Electricity Act 1996

Under the Electricity Act 1969, SIEA trading as SP is an autonomous, government-owned entity, endowed with the necessary powers to carry out its functions as the responsible authority for the generation, transmission, distribution and sale of electrical energy throughout the Solomon Islands. The Authority falls under the portfolio of the MMERE, and in accordance with the Electricity Act, SP is responsible to the Minister for MMERE.

2.1.4. Land and Titles Act 1996

The Land and Titles Act is the major legislation that deals with land tenure in Solomon Islands. Three main categories of land are recognized under the Act and that include:

(1) Customary Land;
(2) Fixed Term Leases;
(3) Perpetual Estates

The Lands and Titles Act has a system of registration of different types of leases which allows individuals and groups to acquire titles to land and own land but one must develop the land that has been acquired or registered or else loose the title to the land. The land transfer by local registered owners to SP was done in accordance with the land transfer procedures in the Act.

2.1.5. Town and Country Planning Board Act 1996

The TCPB Act was enacted to administer, control and regulate all land developments other than those under customary land. TCPB was duly established in order to administer and implement the Act. Section 6 provides for the duty of the Board to prepare local planning schemes in consultation with the provincial assembly or the city council in the case of Honiara city. Then, submissions will be made for approval by the Minister so the schemes are gazette. Under the local planning scheme, the Board may under section 7, declare an area as “a local planning area”.

The subproject is located in the Dala which falls within the planning scheme of the Malaita Province. Developers are required to request development approval or consent from the MPG TCPB. In the Act “Development” is strictly defined and means; the carrying out of building, engineering, mining or other operations in, on, over or under land, or the making of any material change in the use of any buildings or other land’. It however, does not cover issues relating to agriculture, fishing and forestry developments.

2.1.6. Mines and Minerals Act (Amendment) Act 2008

Provide management for mining and mineral prospecting by regulating controls in all mining and prospecting associate activities including alluvial mining. Part II of the Act regulates the mandate of the Minister to designate any area as a reserved area and prohibit the carrying out of reconnaissance, prospecting or mining thereon. The same section regulate reconnaissance, prospecting and mining are prohibited in or any village, place of burial, tambu or other site of traditional significance, inhabited house or building, any cultivated land or land rendered fit for planting and habitually used for the planting of crops, any land designated as town land, under the Lands and Titles Act, any state forest or controlled forest within the meaning of the Forest Resources and Timber Utilization Act unless some kind of arrangement authorized by the Minister in consultation with landowners and commissioner of forestry are established.

Section 65 outlines the format of the Building Materials Permit (BMP) application that will be made to the Director of Mines with a prescribed fee that is usually paid at the Inland Revenue Division (IRD) and a receipt attached to the application. Section 66 outlines the forms and content of the Building Materials Permit (BMP) application, and Sections 67 and 68 have provisions regarding the rights and obligations of the BMP holder respectively. While Section 69 provides for exemptions for the national government or provincial government to mine building materials on any land that is owned by a government department or a provincial government.

2.1.7. Environmental Health Act [Cap 99]

The Environmental Health Act (Public Health Act), enacted on 1st August 1980, provides for the management and control of community health in Solomon Islands. Mainly administered by the Minister, the provisions also identify Enforcement Authorities for purposes of preventing the occurrence or for checking the spread of any noticeable diseases, provision and protection of water supplies and management of drainage and sanitation practices.

The Public Health Act serves as the Health Impact Assessment reference in identifying the necessary practicable measures for preventing all conditions liable to injurious or dangerous to health arising from the erection, or occupation of the subproject.

2.1.8. Safety at Work Act

This Act consists of 4 parts.

- Part II: Article 4 states that it is the duty of every employer to ensure the health and safety at work of his employees.
- Article 6: states that it is the duty of the employer to provide a safe workplace for persons other than his employees.
- Articles 7 and 8: requires manufacturers, suppliers of tools and equipment and suppliers of chemicals and other hazardous substances to ensure that these are safe and without health risks.
- Article 12: states that any employer who operates unsafe machinery or substances and is injured will be responsible for the damages.
- Part III: Article 15 requires the employer to protect people from dust, fumes, etc. Article 16 provides for limits of exposure to dust and fumes.
- Articles 17, 18, 19 and 20 require employers to comply with the operating requirements for: (i) pressure and vacuum systems; (ii) machinery; (iii) dangerous machinery; and (iv) electrical installations.
- Articles 21 and 22 require workplaces to have fire protection and to take precautions against explosions.

2.1.9. Wildlife Protection and Management Act 2010

The Wildlife Protection and Management Act 2010 provides for the conservation, management and protection of wild flora and fauna in the country. It regulates the export and import of wildlife ensuring compliance to obligations set under the Convention on International Trade in Endangered Species (CITES). The Solomon Islands is a refuge for many species of wildlife (that includes rare and endemic). Their need for protection and a sound management is remarkable. The act prohibits the poaching of wild fauna and flora as well as harvesting of protected species.

2.1.10. Custom Recognition Act 2000

The Custom Recognition Act 2000 provide recognition to the existence of any customary law and the nature of such customary law in relation to a matter, and its application in or relevance to any particular circumstances, shall be ascertained as though they were matters of fact. However, the existence shall be provided in proof as required under section 5 of the act.

2.1.11. Unexploded Ordinance (UXO)

Technically WWII ordnance found in the Pacific Islands can be defined as either unexploded (UXO) or abandoned (AXO). Unexploded ordnance is defined as explosive ordnance that has been primed, fused, armed or otherwise prepared for use in armed conflict but has failed to explode. Abandoned explosive ordnance is defined as explosive ordnance unused during an armed conflict and subsequently abandoned or left behind. UXO and AXO are defined collectively as Explosive Remnants of War (ERW)[2.]

Solomon Islands was the scene of bitter fighting during World War II. While this was over 60 years ago, unexploded (UXO) may still be found around Malaita. Should UXO be discovered, the contractor is to immediately cordon off the area, arrange the evacuation of nearby residences and inform the police of the find. Currently all UXO finds are reported to the police who arrange the pickup, transport, storage and ultimate disposal of the finds. While construction sites are expected to be swept for and cleared of UXOs, a chance find procedure for handling the UXOs during the construction is included in the ESMF. This will be the responsibility of the contractor. Ultimately, the SP will be responsible for the supervision and monitoring of the contractor.

2.2 Solomon Islands Environment Assessment Process

The Environment Impact Assessment guideline is design to administer the schedule 16 of the Environment Act 1998. The guideline comprises of EIA procedural descriptions, stakeholders in the EIA process and fees required for development type. “The guideline was prepared by the ECD with the aim of simplifying the procedures in the Act, provide basic advice and guidance to government officers, planners, developers, resource owners on the environment impact assessment process” (MECM, 2010). The EIA guideline was reviewed by Technical Assistance under Asian Development Bank in 2015.

[2]Francis S, L and Alama L, 2011. *World War II Unexploded Ordnance,* Retrieved at URL on 29thof October 2013 at URL: http://www.forumsec.org/resources/uploads/attachments/documents/UXO%20final.pdf.

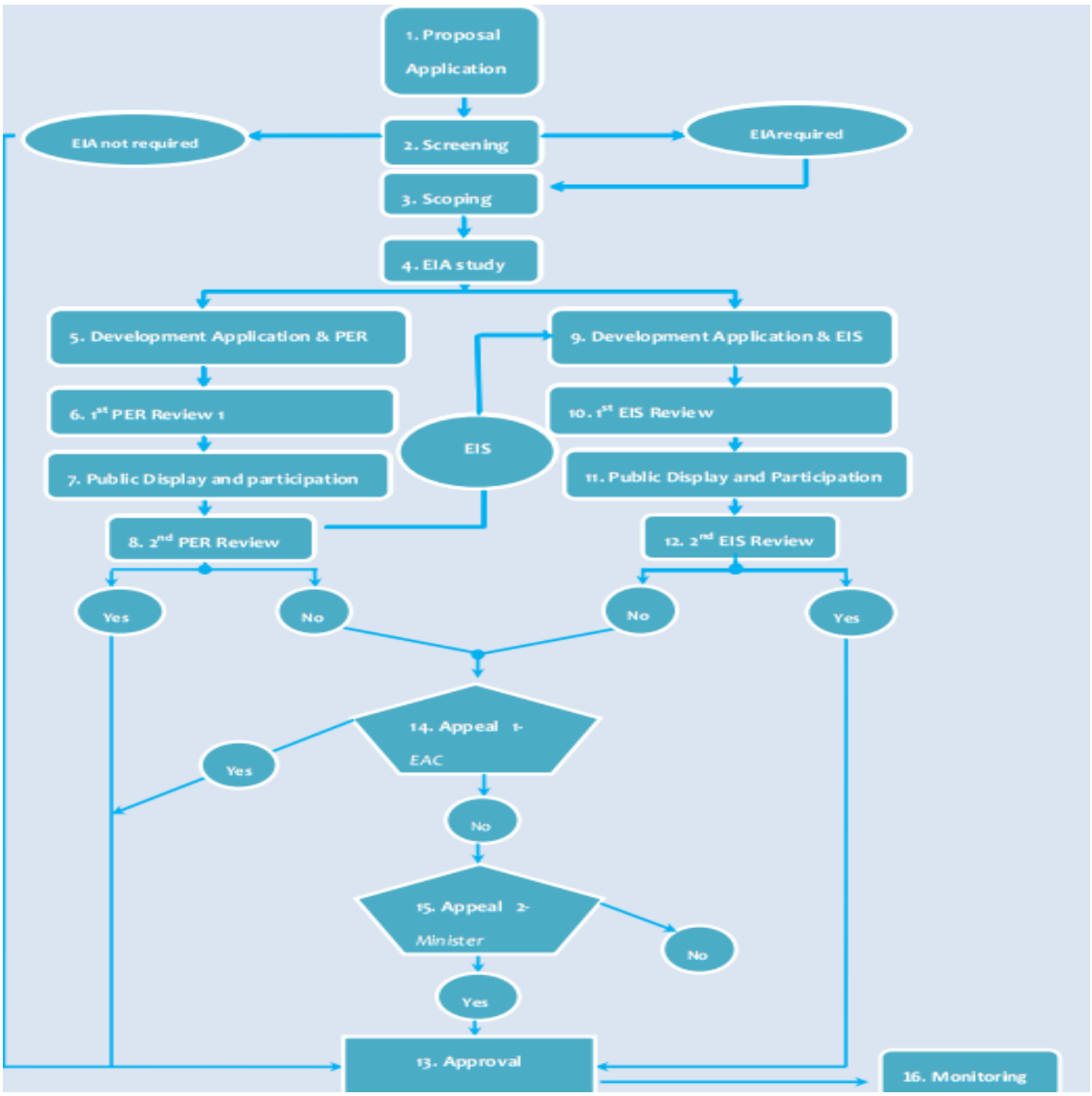

Figure 1: Procedural steps of an EIA[3]

2.3. World Bank Safeguard Policies.

2.3.1. OP 4.01.

OP4.01 (Environmental Assessment) sets out the general policies and principles for environmental and social protection for projects or subprojects financed by WB and the requirements for assessment of impacts and implementation of plans and measures to mitigate or manage impacts. The OP4.01 has been used to classify projects or subprojects.

[3] MECM,2010, EIA Guideline

The four categories defined in the OP4.01 are:

- **Category A.** The subprojects are likely to have significant adverse impact on sensitive and valuable ecosystems (protected areas, wetlands, wild lands, coral reefs, and habitats of endangered species), cultural heritage sites (archaeological, historical sites or existing cultural sites), densely populated areas where resettlement is required or pollution may be significant, heavy development areas and conflict in natural resource allocation, water bodies and land or water containing valuable resources. Since the impacts are adverse, the level of assessment is an Environment Impact Assessment (EIA) or EIS as for Solomon Islands.
- **Category B.** Potential adverse impacts on human population and environmentally important areas (e.g. wetlands, forest, grasslands and natural habitats) are less adverse, temporary, reversible and can be mitigated more readily than those of category A subprojects. The level of assessment required is equivalent to the SIG PER.
- **Category C.** The subprojects are likely to have minimal or no adverse environmental impacts. Category C subprojects do not require an EIA/EIS or PER. The subprojects require an ESMP.
- **Category FI.** Subprojects involve credit line or an equity investment in a financial intermediary. Involves subprojects that will have insignificant environment social impacts and do not require ESMP.

2.3.2. Other WB policies.

Table 1: Other WB policies

Policy	Policy Triggered	Reasons
OP4.04 (Natural Habitats)	Yes	The subproject involves clearing of natural and modified habitats.
OP4.36 (Forests)	No	The area does not have natural forests.
OP4.09 (Pest Management)	No	Subproject does not involve use of pesticides
OP4.11 (Physical Cultural Resources)	Yes	Earth movement/excavation/digging can unearth cultural resources
OP4.10 (Indigenous People)	No	SP to acquire land easement through lease arrangement. Five registered owners across the entire route.
OP4.12 (Involuntary Resettlement)	Yes	An abbreviated resettlement plan prepared to capture land and non-assets likely to be affected. There will be no physical displacement of people.
4.37 (Safety of Dams)	No	The Subproject does not include construction of operation of a dam.
OP 7.50 Projects on International Waterways	No	No subproject activities in international waters.

2.4. Solomon Islands National Policies

2.4.1. National Development Strategy (NDS)

The National Development Strategy comprise of strategies and actions to achieve the development aspirations of the country. Using the 17 Sustainable Development Goals (SDGs), "Transforming our World: the 2030 Agenda for Sustainable Development" as a reference, the NDS highlight five important long-term development goals and two of them; 1. NDS Objective One: Sustained and inclusive economic growth, and 2. NDS Objective Six: Develop Physical Infrastructure and Utilities to ensure all Solomon Islanders have access to essential services and markets. In order to achieve all the NDS objectives; it must be realized that access to electricity is crucial to all sectors. The subproject objective is in line with the NDS and promotes economic empowerment and sustainable development.

2.4.2. National Energy Policy 2014-2024

The NEP recognizes the importance of reducing dependency on imported fossil fuel. Solomon Islands have abundant of resources renewable energy source such solar, hydropower, geothermal and biomass and wind energy. NEP was developed to guide the country in its efforts to provide electrification for the growing population by exploring opportunities in renewable energy sources. Development partners and the government had been providing and promoting the use of renewal resources through various technologies. SP is a key player and is embarking on solar hybrid projects to meet obligations under this policy.

2.4.3. National Energy Policy Framework 2007-2009

The National Energy Policy Framework sets out Government's policies for planning and management of the energy sector over the next 10 years. The framework defines strategies the SIG is taking to ensure objectives of this policy are fully realized. Twelve strategic areas covered in the policy include: 1. Energy Sector Planning; Coordination and Management; 2. Petroleum Sector; 3. Transport Sector; 4. Electricity Sector – Urban; 5. Electricity Sector – Rural; 6. Renewable Energy; 7. Environment; 8. Energy Conservation and Efficiency; 9 Capacity Building and Information; and 10. Legislation and Regulations. The transmission line subproject is a fulfillment of the 5th strategic areas (Electricity Rural).

2.4.4. Climate Change Policy

The Solomon Islands Government through the MECDM launched the Climate Change Policy, highlighting steps the government would take in aiding the country and its people to exist and adapt to present imminent climate change and its impact. The Policy aims to integrate climate considerations within the framework of national policies, and guiding the government and its partners to ensure the people, natural environment and economy of the country are resilient and able to adapt to the predicted impacts of climate change. SP commitment to greenhouse gas reduction by reducing reliance on diesel generators is clear contribution to global efforts.

2.4.5. National Environment Management Strategy

The primary document for environment policy in the country is the 1993 National Environment Management Strategy (NEMS), although outdated; it is an import document at the present time in the absence of an environment policy.

2.4.6. National Waste Management and Pollution Control Strategy

The formulation of the National Waste Management and Pollution Control Strategy (NWMPCS) 2016-2024 is part of the ongoing efforts in the country to address the issue of waste and pollution as the country enters a period of rapid social and economic change. The objectives are:

1. The development of our natural resources does not compromise the wellbeing of natural environment, ecosystems and wellbeing.
2. Ensure that existing legislations, strategies and guidelines on waste management and pollution control are effectively implemented and enforced.
3. Support, encourage 4Rs and where relevant regulate waste minimization for solid wastes noting that organic waste form a large component of wastes produced in the country.
4. Develop institutional capacity and train waste and pollution experts for the country.
5. The government through MECDM, provincial government and Ministry of Infrastructure Development (MID) ensure that all provincial centres have in place proper landfills or waste disposal sites and a functioning waste collection system.
6. All Solomon Islanders are aware of the issue of waste and pollution and are taking appropriate actions address it.
7. Waste management and pollution control activities are undertaken based on accurate data and research, update information, new innovation and technology
8. Encourage public-private partnership and investment in waste management and pollution control.
9. There is in place a long financial mechanism in place at the national level to manage waste and address pollution issues.
10. International guests and tourist are able enjoy and enjoy the natural beauty and aesthetic value of the country.
11. Waste management and pollution control is fully addressed in responding to climate change and natural disasters.

One of the highlights of the strategy is the management of e wastes such as solar batteries. It is important all waste collection and disposal associated with the subproject during construction, operation and decommissioning are in line with the strategy.

2.5. International Conventions and Agreements

Solomon Islands is a party to some of the international treaties and conventions. The agreements are detailed in Annex 2.

3.0 SUBPROJECT DESCRIPTION

3.1. Subproject Proponent

Name of Company: Solomon Power

Address: Solomon Power, P.O. Box 6, Ranadi, Honiara

Contact Person: Jeremy Maneipuri

Official Designation: General Manager Capital Works (Ag)

Tel: + 677 42463,

Email: Jeremy.Maneipuri@solomonpower.com.sb

3.2. Subproject Objectives

The subproject development objective is to increase access to solar grid-supplied electricity and increase renewable energy generation in Solomon Islands. This will, in turn:

- Promote clean, renewable energy;
- Assist in reducing green-house gas emission;
- Promote environmental benefits by reducing fossil fuel and oil usage including disposal;
- Supports the realization of the NEP renewable energy target and
- Reduce reliance on diesel-generated electricity.

3.3. Subproject Justification/Need

The obligation of SP is to support SIG commitment to the SINDS goals and targets. The subproject objective is to improve energy efficiency in rural communities. The growing energy demand, SP extend to provide energy to the rural area and SIG will need to recognize the need of electricity and can participate in the initiatives in all 9 provinces.

Dala is situated in the Western region of Malaita, most land are owned by native tribes from West Kwara'ae and Fataleka. Several portion of the land around the area are registered Perpetual Estate property under trustees, whilst few are subjected to Fixed Term Estate under the Malaita Provincial Government. This include the Suufau land proposed for the solar site. Dala was an old substation and administers important agricultural activities for the province. It was abandoned for quite some time now. During its operation people especially in North Dala have accessed to electricity. Communities consulted confirmed that access to electricity is important to their daily operations, programs and creates an opportunity to generate income. The private sector, especially business people, reiterate the need for consistent and reliable electricity. In 2019, the PE holders tendered a consent letter, for SP to acquire and develop the site. In the same year and in response to the request, SP conduct a study of Dala and surrounding communities and present it to the SP board.

3.4. Subproject Location

The solar site is located on Malaita Provincial Government land registered as FTE in Ward 4, near Dala village. Dala is located approximately 25km east of Auki, the Malaita provincial capital and can be accessed by both land and sea transports. It is an hour by vehicle and thirty minutes by Outboard Motor Engine. Refer to figure below for details.

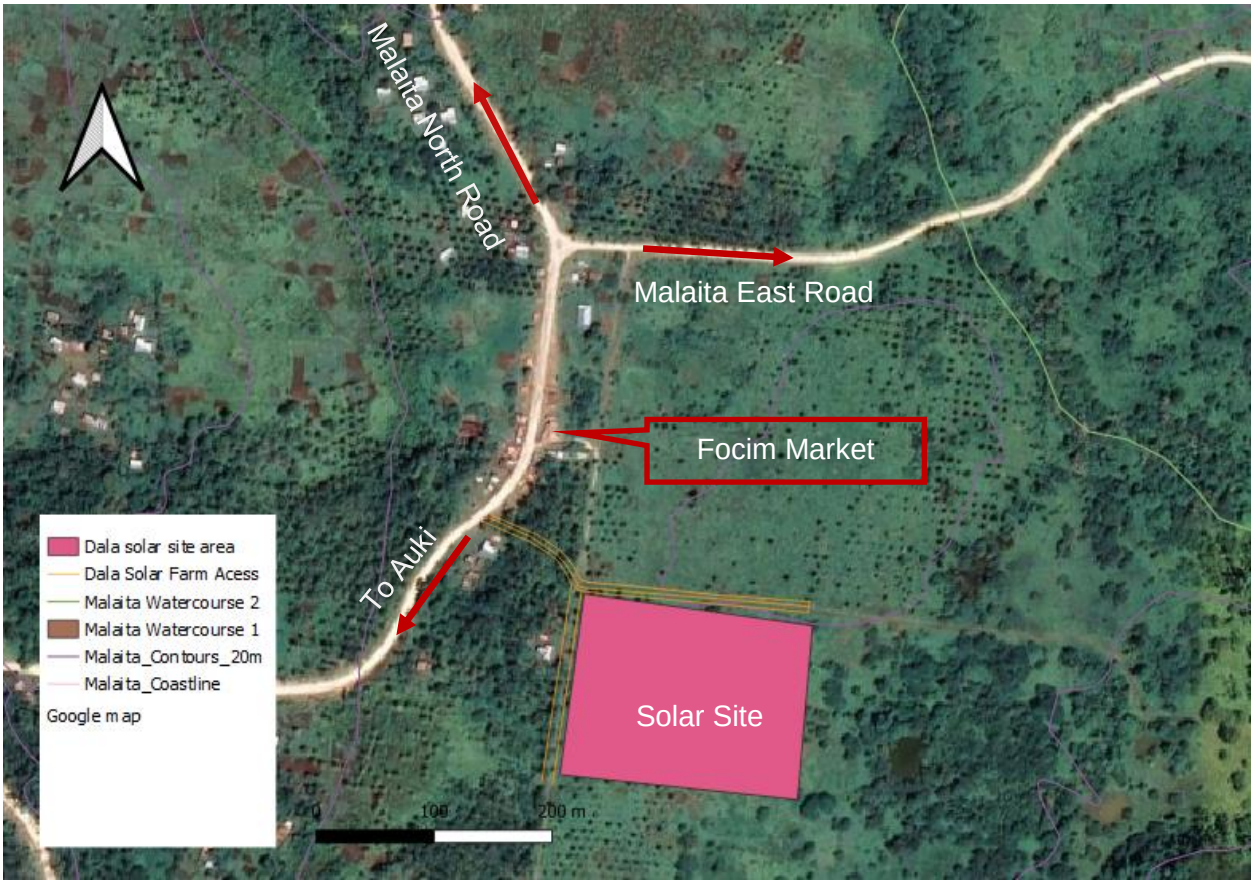

Figure 2: Subproject solar site in Dala.

3.5. Subproject Scope of Work

3.5.1. Vegetation Removal during Surveying, Demarcation and Clearance

There are no vegetation species that have significant conservation nor representative of original vegetative cover. The solar site and adjacent areas had been subjected to clearance in the past for establishment of the coconut plantation and paddock. As a result, colonized by weeds, scrub, and ground cover and for some case planted with garden crops. All material, slash and debris resulting from clearing works, would be disposed at provincial council designated site on the approval of the Project Manager (PM).

3.5.2. Minimal Road access upgrade

The subproject will include the construction of a 100m road access from the main road to the solar site. The road access will have a cross section of 6m, a 4m carriage way and 1m shoulder on both sides. The specification includes low maintenance hard compacted surfaces of appropriate durability for parking of vehicles, manual movement of heavy plant and heavy vehicles required during construction and ongoing operations and maintenance. There will also be provisions for 4m wide road around the solar panels and a parking area.

3.5.3. Fencing and security

The remoteness of the subproject site substantiates the need for fencing and twenty-four hours' security service. A chain link fence is recommended and three layers of barb wire. According the specification, the contractor will provide secure perimeter fencing prevent ingress of unauthorized personnel, general populace and small animals such as dogs and cats. Positioning shall nominally at property boundaries. Fencing for the system shall attach to and expand the area boundary of the existing system. The existing design is acceptable to be continued for the expanded perimeter of the site, SP preference is galvanized fence type with sufficient galvanizing layer to resist corrosion in the environment. Fencing should not shade the solar Photovoltaic (PV) panels during prime generation periods. Sufficiently heavy padlocks resistant to corrosion are to be provided by the contractor to secure access gates provided. It is standard practice for Solomon Power to fence areas acquired for all Solar Farm sites. This would not only provide public safety during construction but long term safety measures for resident near the subproject site and public at large. There are no impacts associated with restrictions on local community access since there are no foot tracks or roads inside the acquired area. The solar farm site does connect to a provincial road access. The contractor will be required to submit a traffic management plan as part of the CESMP to manage traffic during construction. An indicative design would include:

- A heavy mesh fence of 4 m overall height with the upper section barbed. Steel posts shall be "hockey stick" design, heavy duty galvanized, in concrete foundations.

- A continuous concrete strip approximately 200x150mm reinforced with 2x 12mm rebar with upper surface at ground level is proposed. The lower section of mesh shall be secured to the strip using galvanized rebar or stainless steel loops set in the concrete and secured to the fence by stainless steel fixings at intervals not exceeding 600mm.

- At access gates the strip shall be further reinforced for heavy traffic to 300x300 and necessary reinforcement.

3.5.4. Installation and mounting of solar

The main component of the system is an array of solar panels mounted above ground level. It is uncertain at this stage the number of solar panels but the expected output is 486kWa. The proposed height at this stage is 1-3m. The solar panels will be mounted on reinforced concrete platform. There will be walkway between the solar rows or columns to enable maintenance and regular inspection. See below design layout.

The mounting structures (also referred to mounting system), which includes its footings or piles, shall be appropriate for the site. The modules shall be positioned in such a way as to maximize the annual electrical energy output and avoid shading from adjacent structures (including PV arrays) and trees. The PV mounting structure should be from at least a Tier-2 manufacturer with a strong technical, service and warranty capability and with the following minimum requirements:

- Structure requirements apply to all items required to accommodate the modules and associated electrical equipment including rails, module clamps, fasteners, cable trunking / purlins, cable clamps etc.;
- Structures shall be fixed, metallic and having appropriate design and adequate strength which can withstand the load of the modules, snow loads (not likely to be encountered in the applicable climate), seismic loads, cyclonic and high wind velocities as specified in this document;
- The mounting structure including fastenings shall be constructed of non-corrosive, UV-stable materials to meet the durability requirements for tropical marine environments;
- Use of dissimilar metals in contact with each other shall be avoided where practically possible in order to prevent galvanic corrosion. Where dissimilar metals must be used, suitable measures shall be employed in order to prevent galvanic corrosion (e.g. insulating material between dissimilar metallic materials);
- The structures shall be designed for simple mechanical on-site installation with no requirement for welding, cutting, drilling or painting of metal structures onsite;
- The mounting structure shall avoid accumulation of water or moisture within the structure and shall accommodate an adequate flow of water off the structure;
- The design of the array mounting structures should ensure that all parts are pre-cut, pre-drilled and prepared before delivery to the Site and should not require the need to be cut in the field. This is to avoid damage to corrosion resistant coatings. All sharp edges are to be removed at the factory;
- Modules shall be secured in line with the module manufacturer recommendations;
- Each PV module shall be fastened securely at least at four points or completely along two opposite sides, but under all circumstances adhere to the minimum fixing requirements as required by the PV module manufacturer;
- The structure shall be suitable for the module type to be installed with due consideration given to: o Module weight (inclusive of any micro inverters);
- Module manufacturer requirements with regards to mounting locations and cable management;
- Ability to expand / add additional modules without modifying the existing structure;
- Air ventilation to the back of the panel to prevent Power de-rating due to thermal buildup;
- The structure shall provide facilities for earthing of all metallic parts (inclusive of the modules);
- The mounting structure design shall be in accordance with the standard requirements and certification by the manufacturer to this extent would be required;
- Provision shall be made for cable management with no sharp edges that could result in damage to cables or persons during installation, maintenance or decommissioning (e.g. through the implementation of rounded edges or end covers/clamps on rails);
- Structures shall have a design life of at least 25 years.

- Solar PV modules mounted on the array frame structures shall be situated above the expected flood level and be at least consistent with the existing system design in terms of installed height.[4]

3.5.5. PV Modules

Only PV modules with the following minimum requirements should be considered:

- Poly or Mono crystalline cells including bifacial, back contact or other silicon cell design arrangement (thin film or amorphous is not preferred);
- Power tolerance shall be a positive power tolerance (+0 to +3Wp or better);
- The PV module shall withstand the wind loadings present at the Site;
- The PV module shall include drain, earth and mounting holes in its frame. No holes shall be drilled on site;
- The PV module frame shall be made from marine grade anodised aluminium or stainless steel with appropriate seals to prevent water ingress and damage to the active components;
- No specific colour (frame, back foil) requirements are requested;
- The front glass of the PV module shall be tempered glass with a minimum thickness of 3.2mm;
- The PV module shall comply with International Electro-technical Commission (IEC) 61215, IEC61730, IEC61701 ED2 and IEC 62716;
- Potential-Induced Degradation-free PV cells and modules, unless the PV system is appropriately designed to reverse PIE-effects;
- Bypass diodes are required on each module. No reverse blocking diodes for the system are required;
- Standard locking connectors (e.g. MC-4 or equivalent) certified to EN 50521 are acceptable for panel connections. Corrosion of terminations causes increased voltage drops therefore the number of connections shall be limited. A wiring layout diagram defining the PV panel interconnections will form part of the documentation to be provided by the Detailed Design;
- The terminals must be clearly marked with + and – for the corresponding connections;
- Test certificates must be available;
- The manufacturer cannot be insolvent or going through (partial) bankruptcy at the time of design or installation of the PV System; and
- The modules shall be under the manufacturer's active production and shall not be superseded stock.

Manufacturer documentation with the following information about the PV modules must be available:

- Temperature coefficients for current, voltage, and power;
- I-V curves under different temperature and radiation conditions;
- Physical dimensions and weight;
- Details of the materials used in the module's frame;

[4] James, J (2018), *Solomon Power Tingoa, Visale, Baolo, Dala and Buma Solar Hybrid Specifications:*

- Type and number of cells per module;
- Cell efficiency and/or module efficiency;
- Details of the connectors used and the length of the connecting wires;
- The warranty statement and testing certificate;
- Proof of manufacturer financial stability;
- Solar Modules supplied must have individual flash test data available in soft copy; and
- Pallets and packaging PV modules are supplied within must list modules serial numbers contained within the pallet on the outside of the pallet in a collectable print out.

Note that the Contractor shall illustrate that the design allows for system flexibility to accept more than just one type of PV panel by providing a ranked list of 2 or more other OEM PV panel types suitable for conjoint use. It is expected that the concept design presented shall be able to have PV modules changed to the next highest power class if needed due to manufacturing improvements. Total installed panels at commissioning should guarantee the required plant sizing and output at 10years. [5]

4.5.6. String and Central Inverters

By definition, a String or Central Inverter (or a grid-tie inverter) is connected directly to the PV panels and contains an embedded Maximum Power Point Tracker (MPPT) which enables the Inverter to optimize energy production from the PV panels. The Contractor is required to specify the appropriate inverters for the site with respect to the capacity and suitability for the designed PV System. The minimum requirements for both types of inverters include:

- String inverters are connected to the PV panels and shall provide a balanced three phase power output to the AC bus;
- The string inverters shall be located near the PV panels unless larger central inverter types are used, have a protection rating of IP 65 (according to IEC 60529) and be protected from sea spray. For Sites where the inverters are located in an indoor dry space, this requirement may change to IP55;
- The string inverters shall have as a minimum one maximum power point tracker (MPPT) and only PV panels mounted on the same horizontal angle and orientations should be grouped together and connected to the same MPPT. It is however encouraged to use the same inverter but a separate MPPT to convert power from two strings mounted at different horizontal angles but with the same orientation because this will increase the conversion efficiency;
- Grid-tied inverters shall be sized appropriately for the maximum module peak power rating under all weather conditions of the Site;
- The Contractor shall ensure and confirm that the DC operating voltage window and current limits of the inverters are not exceeded under all environmental conditions.
- The inverter shall be designed to operate from -20 to +60 degrees centigrade and from 5% to 95% relative humidity;

[5] IBID 4

- It is of paramount importance that the output voltage capability of the inverter is matched with the supply voltage from the utility;
- The Contractor shall ensure that the ventilation and air requirements are appropriately specified so that the cooling requirements of the inverter can be met;
- The Contractor shall specify suitable mounting positions for the inverter (and enclosure, if applicable), in accordance with manufacturer's specification;
- Electronic components will be sealed from contact with salt air and all cooling will be through external heat sinks and not through ambient or forced air flowing across the electronic components;
- The inverters shall not be placed in direct sunlight;
- The location and installation of the inverter shall comply with site restrictions for appropriate and safe access during operation of the inverter;
- The Total Harmonic Distortion injected onto the grid by the inverter shall be less than 3%, and the output of the inverter shall be a true sine wave;
- The Contractor will endeavour to minimise the number of different types of string inverters by standardising on a typical inverter size to reduce the number of spares. SP prefers the use of 3-phase string inverters with a minimum unit rating of 20 kW. On this basis sizing of any plant can be increased or decreased by this as a multiple and that any section of 20kW (or greater) may be taken out of service for maintenance with minimal overall Plant impact;
- The power conversion efficiency of the DC>AC string inverter shall exceed 97% and that of the bi-directional inverters >94% while operated above 20% of PV array rated power. Cable length and cable diameter shall be carefully considered to optimise system efficiency;
- Terminations between PV panels and string inverters shall be in accordance to manufacturer specifications and no installation practices or terminations shall be used that may void manufacturer warrantees;
- Inverters shall comply with AS/NZS 4777.1, 2 & 3 and shall have an option or setting to respond to grid voltage to curtail the power fed from the PV panels to the local grid. This is possible in the case of a high ratio of on grid generation to load;
- Inverters shall have a valid Certificate of Suitability, numbered and dated to testify on its testing, which was conducted within the last five years;
- The inverters shall have passive and active anti-islanding protection as per AS 4777.
- The string inverters shall detect islanding mode when the grid fails and automatically shut down power from the PV system as per the requirements of AS 4777.3;
- The inverters shall detect normal main grid supply and automatically start supplying power from the PV system as per the requirements of AS 4777.3;
- Open protocol standard such as Modbus for seamless integration to third party systems are required. Closed or proprietary protocols are not acceptable unless approved by the Employer. It is anticipated that a separate energy meter for the system with MODBUS communications available as a minimum is installed on the main Solar PV feeder to facilitate future monitoring from the future SCADA system installation;

- A separate, external manual isolation switch shall be installed to provide isolation of the inverters from the LV network;
- Inverters are to be installed in order to not interfere with onsite backup generation or transfer switching arrangements;
- The inverters shall be from a Tier 1 original equipment manufacturer (OEM) of inverters with a strong regional technical and service capability for Central and String inverters; and
- The minimum standard warranty shall be 5 years[6].

3.5.7. Solar System Integration and Electrical Interconnections

Electrically a string of PV modules is connected in series to form a PV string with a higher output Direct Current (DC) voltage. The strings may be collated in DC combiner boxes (generically referred to as combiner boxes) before it is supplied to the string inverters. The Alternating Current (AC) power supplied by the string inverters are collated in an AC distribution board (generically referred to as a DB), from where AC power is supplied to an AC bus which interconnects the system to the site electrical infrastructure and electricity grid. For all interconnection boxes in the PV system, such as junction boxes, combiner boxes and Low Voltage (LV) distribution, the Contractor shall ensure that the design allows for the following:

- Junction boxes (or combiner boxes) shall comply with AS/NZS 60529;

- All cable entries shall maintain the enclosure IP rating;

- Within the junction boxes, switchboards and equipment, conductors are loomed and laced together, with PVC straps or strings. The conductor is appropriately bent to ensure straight entry into the terminal, allowing sufficient spacing and length of the wire for easy disconnection and reconnection;

- DC from the PV arrays inputs shall be suitably fused with dis-connectable fuse holders to provide overcurrent protection and PV array disconnection;

- Should a DC system rated to 1500VDC be used, not just the cable insulating ratings but the plugs, sockets, interconnectors, fuse holders, surge diverters etc… shall be rated to 1500V DC;

- AC power inputs and outputs will be adequately protected by well-coordinated circuit breakers (CBs);

- The box is manufactured from powder coated hot dipped galvanized or Aluzinc coated steel or glass reinforced and UV stabilized plastic material and feature an IP65 rating or higher suitable for corrosive marine environment;

- All cable entries shall maintain the enclosure IP rating;

- Where conductors enter a box without conduit, a tension relief system shall be used to avoid cable disconnections inside the junction box;

[6] IBID 4

- All conductors inside the boxes shall be loomed and lace together, with UV rated straps, rated to be suitable for the life of the subproject; and

- Conductor if bent to enter terminals shall comply with manufacturer bending radius and be done in such a way as to allow sufficient spacing and length of the wire for easy disconnection and reconnection.

The Contractor shall ensure that all cable trays and other cable support systems for all cables, wiring and communication cables, allows for the following:

- The support system shall be positioned adequately to provide access and room for inspection, replacement or additional cabling;
- All components including but not limited to bends, connectors, trays, brackets shall be sized to adequately support the installed cable; and
- Sufficient spacing shall be provided for no less than 20% of additional cabling;

The cables shall be fixed to the support system by appropriate ties, straps or saddles. Stainless steel straps shall be used on cables that supply essential safety services. UV stability of all fixings shall be considered, Nylon 12 cable ties are commonly used for small cable support in areas exposed to direct UV radiation although non plastic materials such as Acetal are the only known materials that will provide a design life greater than 20 years.

- Cable trays shall be designed to ensure that there are no water accumulation points inside the tray;
- Provide segregation for LVAC, DC and communication circuits
- Cables exiting ground level must be mechanically protected by conduit or steel covering arrangement to at least 300mm above ground level so that maintenance use of mowers, trimmers or whipper snippers shall not risk damaging cable insulation near ground level;
- Provide conduit and cable management design such that termites or other insects shall not be able to affect cabling;
- Ensure bending radii are met on cabling; and
- Effectively manage thermal resistivity of soils and thermal loading on bunched cabling and conductors.

For all electrical cables or interconnecting wiring used in the PV System, the Contractor shall ensure that the design allows for the following:

- Installation, protection, termination and jointing of cables in accordance with relevant Australian standards and particularly Australia/New Zealand Standards (AS/NZS) 3000, AS/NZS 3008 and manufacturers' recommendations;
- All PV System wiring is designed in accordance with all relevant standards including AS/NZS 5033 and AS/NZS 3000 and AS/NZS 3008.1;
- The DC cabling from the PV modules to the inverters is sized such that the installed voltage drop for each circuit remains below 2% at all times;

- The AC cabling from the inverters to the connection point meter is sized so that the installed voltage drop of each circuit remains below 1% at all times;
- DC Cables are double insulated and sheathed. Cable sheathing is UV stabilised to ensure that no degradation throughout its working life occurs;
- DC cables are neatly secured behind modules and between sub-arrays. Also that DC cables are sheltered from direct rainfall;
- All cables are protected from the effects of climatic conditions and in particular UV radiation;
- No cabling is exposed to direct sunlight, even if sheathing is labelled as UV stabilised. All cabling that may be exposed must be routed through UV stabilised conduit;
- All cables are protected from mechanical damage in accordance with AS/NZS 3000;
- Cables shall be clamped in order to relieve tension and prevent conductors coming loose. Plastic cable ties must be protected from both direct and reflected UV radiation. Cable ties exposed to UV must be stainless steel;
- DC cabling shall achieve type test in accordance with EN50521 for 1500V.
- DC cables is rated to operate at the open circuit voltage (Voc) generated by the longest string of modules in the facility at the lowest expected temperature at the site;
- Cables are secured and mechanically protected over their entire length. Steel wire armour shall only be used for large sub-array DC voltages and multi-core cabled for AC voltages;
- Energy losses due to cabling shall not exceed 2% of generated power (considered from the main LV circuit breaker at the connection transformer);
- Cables shall occupy less than 66% of the available conduit space;
- All conduit installed within reach of the PV rays shall be UV resistant or protected from UV using an appropriate method;
- Cables are provided with protection against vermin, where required by site conditions;
- DC cables are installed in a manner which minimises induction loops between positive and negative cables. In particular, for string cables, large loops of excess DC cabling shall be avoided;
- All underground cable routes (if applicable) are clearly marked with suitable above ground cable markers to prevent accidental damage to the underground cables;
- Cable joints are limited by planning continuous cable runs along entire cable route lengths;
- Marking of all electrical equipment (including conduits and ducts) are compliant with the Standards and Regulations (or as otherwise agreed upon with the Employer) for marking. All signs and signage are clearly visible, located visibly on the equipment, constructed and installed to remain legible for the design life;
- Markings distinguish between operable control devices, equipment, wiring, indicators, isolation switches, outlets and enclosures to provide instant and ready identification to aid operability and maintainability. Terminology of the marking and labelling matches the documentation provided;
- The numbering system is applied to all DC wiring, AC wiring, PV strings, combiner boxes and inverters. Also that isolating devices such as switches, fuses, isolators and push buttons are numbered and labelled in accordance with the local regulations and good industry practice.

Where appropriate, that each label includes the unique number and a description of the device;

- If 1500VDC rated arrays are designed, cabling insulation must be rated to 1500/1500 VDC to achieve 1500V DC conductor to ground rating. The sheath thickness shall be in accordance with AS5000.1 with Nylon 12 extruded jacket or double brass tape to prevent insect attack; and
- Detailed calculations of cable rating covering maximum anticipated load and fault currents shall be provided together with the construction drawings prior to the procurement of the cable. The calculation shall show all derating factors applied to the cable and shall consider all methods of cable installation used (e.g. direct buried, conduits, etc.)[7].

3.5.8. Secure storage shed for spares

All building will have raised floor and concrete basement. They may have all the necessary appliance for running the solar PV including batteries, transmitters, and transformers. Relevant buildings will have the necessary components of standard building codes such as store rooms, toilets facilities, and sewage system to the agreed standard.

The shed shall be at least of large enough size that the amount of spare PV modules required by this document shall fit securely within with enough space left for storage of sundry maintenance tools for vegetation management including trimmers and a ride on mower. The shed shall have secure roller-shutter door, personnel door access and adequate ventilation from whirly-birds or similar arrangements, if windows are included then they are to be of a type that is secure or resistant to forced entry. All entry points are to be lockable. The shed shall be constructed of weatherproof sheeting and design shall consider the climatic conditions outlined in Section 4.

3.5.9. Water Supply

The current plan is to use extracted water from rainwater. Water will be used for domestic purposes and on site water for fire incidents. The current plan is to harvest rainwater in a 400L tank. The water will be used for domestic purposes and on-site fire incidents. The installation will ensure that water does not pool and cause mosquitoes to breed.

3.5.10. Material requirements

The subproject requires gravel for concrete production. Gravel for concrete production will be sourced from Honiara. Cables, solar panels, poles, cement, solar installation parks to name a few will be sourced from Honiara and Overseas. It is an Engineering Procurement Construction (EPC) contract which means the contractor is responsible for detail design, procurement of relevant materials, construction and commissioning.

3.5.11 Construction Force and Equipment

Construction force of approximately 10-15 personals comprising of solar engineers, civil engineers, operators, securities, casuals and managers will be based at the subproject site for the duration of the construction. Workers will be engaged at different stages during construction

[7] IBID 4

so the approximate number will be 10 personals per day. Majority of the workers will be based in Dala and travel to the subproject site during the day time periods.

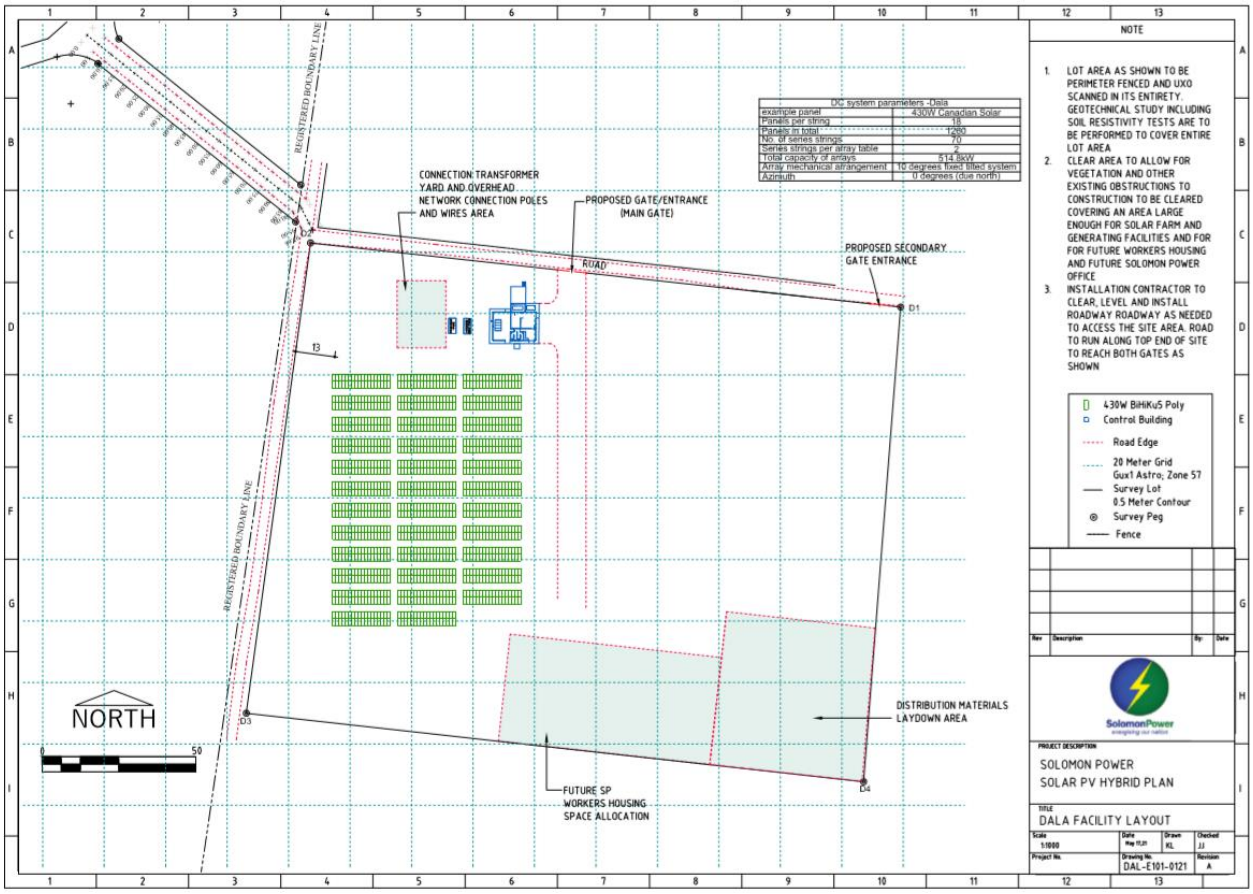

Figure 2: Design layout for Dala Solar hybrid.

4.0 DESCRIPTION OF THE ENVIRONMENT

4.1. Physical Environment

4.1.1. Climate

The Solomon Islands is often subject to the south-easterly trade winds from May to October and the northwesterly trade monsoon winds from December to March. Due to proximity to the equator, air temperature has very little variation. The average annual rainfall ranges from 3,000mm to 4,000mm. The daily average rainfall is averaged at 190mm and 330mm November to January as being the wettest months.

Tropical climate between March and November, whist dry and humid followed by a wet season from December to April. Malaita being a large and mountainous island attribute, to the island as being less dry and colder than the smaller islands in the archipelago. The wet season is extremely wet which also coincides with the cyclone season. Maximum average temperature is 25.7 degrees Celsius 26.7 to degrees Celsius each month with a mean of 26.2 degree Celsius while minimum temperatures range from 22.2 degrees Celsius to 23.7 degrees Celsius with a mean of 23 degrees Celsius.

Since Solomon Islands is located at the north-western boundary of the area where tropical cyclone of south pacific form. Cyclones occurring within 200km of the subproject site over the last 40 years were: IDA, ISA, CARLOTTA, NAMU, IRIS, LINDA, JOY, CYRIL to name few. In November 1966, Cyclone Angela swept the north and west of Malaita and passed on to the south and east coasts of Guadalcanal, bringing devastation and hardship. Hundreds of villages in north Malaita were destroyed, leaving some eight to ten thousand homeless, and coconut palm and cocoa trees ruined. Winds reached sixty to eighty knots and produced seas nine meters higher than normal[8].

[8] http://www.solomonencyclopaedia.net/biogs/E000085b.htm

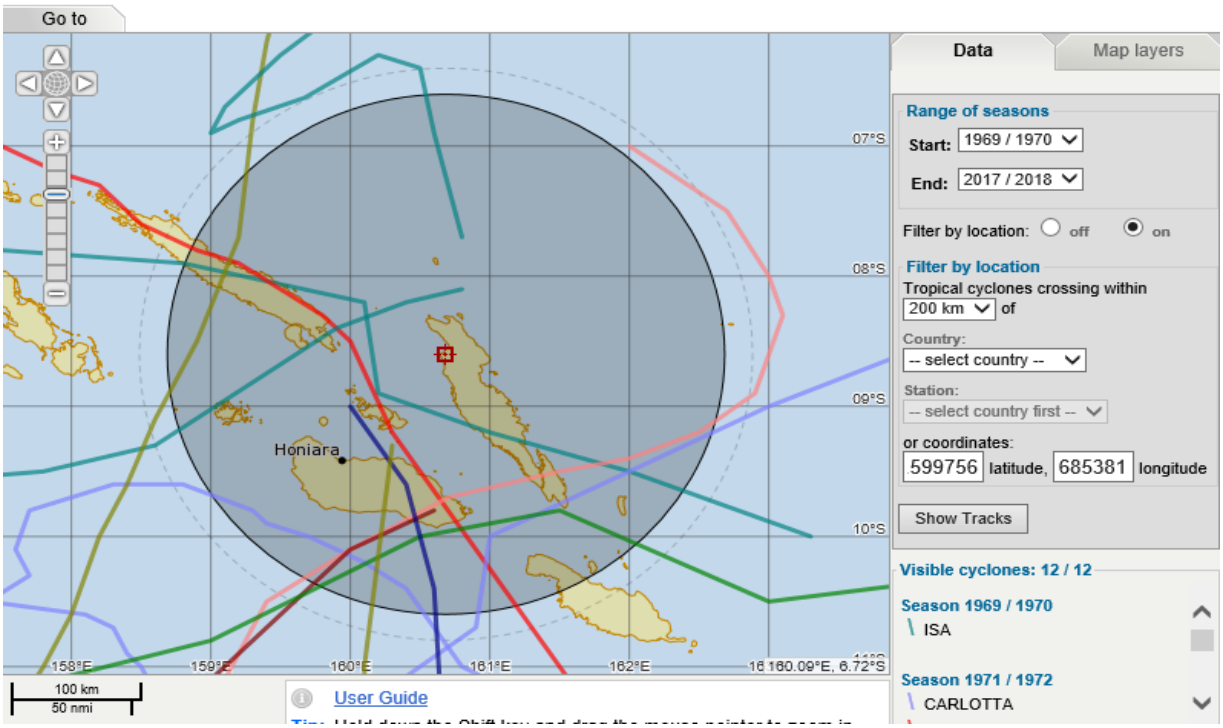

Figure 3: Cyclone track within 200km from Dala

Source: http://reg.bom.gov.au/cyclone/history/tracks/index.shtml, 2015[9]

4.1.2 Topography

Malaita is approximately 4,307 km^2 in area and is about 185 km long with broadest about 35 km wide. It consists of inland rugged mountain flanked by mountainous plateaux, divided hills and restricted coastal terraces along with scattered swamps and valleys. Malaita is made up of two islands parted by the Maramasike passage about 400m wide[10]. The rugged central range contains several high peaks rising to an elevation of 1000 meters including Mt. Kolourat (1,438 m) the highest peak in Malaita. Drainage is north westerly from the middle of the island with north easterly offsets but to the south, the offset runs to the eastern side of the island. The volcanic ridges are bordered by limestone rich-bands forming distinct karstlands[11]. The deep valleys and narrow ridges flanking the volcanic basement have developed over calcareous sediments.

The subproject solar site is located on a flat area approximately 1km from the coastline with an elevation of 63m. The area was used to be a cattle grazing site operated by the MPG. The coastal strip is occupied by villages.

[9] BOM (2016), Cyclone tracks - Southern Hemisphere [beta], Retrieved URL on the 29th November 2019 at URL: http://reg.bom.gov.au/cyclone/history/tracks/index.shtml

[10] Moore, C. (2017). *Making Mala: Malaita in Solomon Islands, 1870s–1930s*. ANU Press

[11] Hansell, J., F and Wall J., R, D (1976). *Land Resources of the Solomon Islands*, Land Resource Division Ministry of Overseas Development, England.

Figure 4: Elevation of the Dala Solar Hybrid Site, google earth.

4.1.3. Geology

Solomon Islands is a double chain archipelago of islands formed by fertile volcanic rock through tectonic activity also known as the Pacific Rim of Fire. The Solomon Islands (excluding the Santa Cruz group) are divided into three geological provinces: a pacific province, a central province and a volcanic province. Islands such as Malaita and most of Isabel are found in Pacific province[12]. The Pacific geological province is the oldest rocks and consist of Late Cretaceous to Miocene limestone and chalk sequences.

The geology of Dala comprise of Recent and Pleistocene indurated coral reef with loose coral pieces and rocks covering the surface. This is due to the wave action that most areas encounter.

Solomon Islands is situated on the ring of fire and is prone to earth quakes. See figure 5 below indicate earthquake hotspots in the Solomon Islands. Malaita is located on low risk area resulting in insignificant risk of earth quake at the subproject site. Designs have been ensured to integrate risk of earth quakes. Geographic location indicate that Malaita is suitable for any development, low risk to cyclone and earthquake[13]. This does not prevent any future destruction of earthquake, thus there will be always risk to any development in the future.

[12] Musgrave, R. J. (2013). Evidence for Late Eocene emplacement of the Malaita Terrane, Solomon Islands: implications for an even larger Ontong Java Nui oceanic plateau. *Journal of Geophysical Research: Solid Earth*, *118*(6), 2670-2686.

[13] Ibid 11

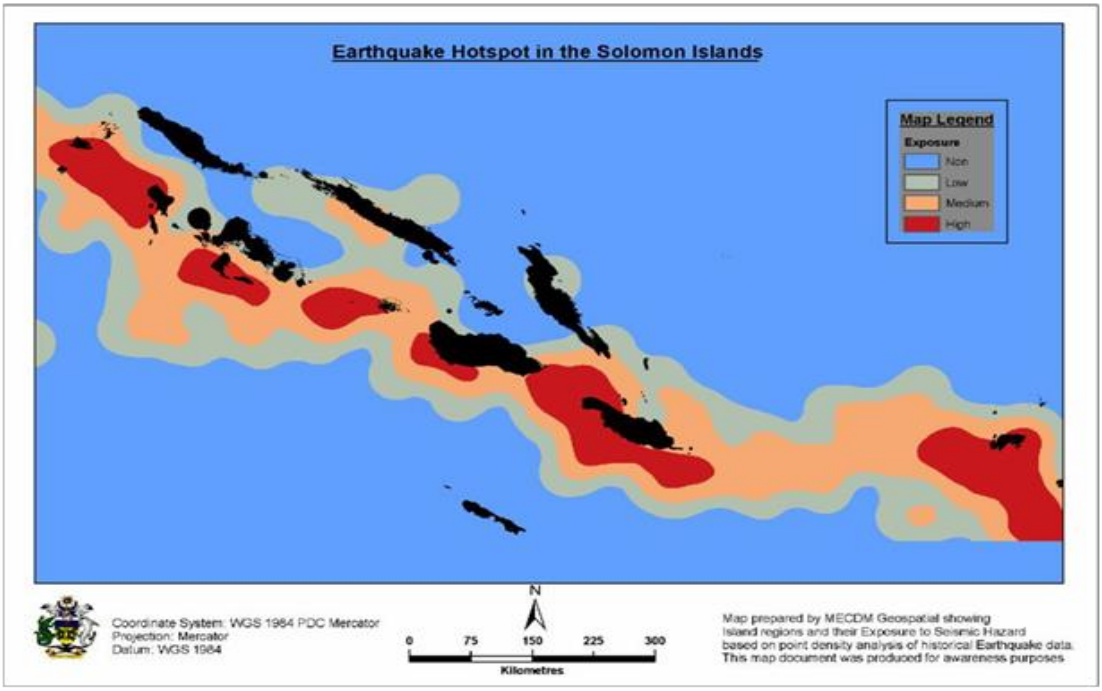

Figure 5: Earthquake Hazard Map (Source MECDM)

4.1.4. Soils

There are 27 soil groups in Solomon Islands. Depending on parent material and land use, soils exhibit a range of fertility. The basalt volcanic derived soils are generally rich in nitrogen, phosphorous and organic carbon, but poor in potassium. Three main types of soil found on the Solomon Islands are volcanic, limestone and island soils. Volcanic soils can either be extremely fertile or just a top coating of volcanic dust over thin coral and clay[14]. Limestone soil can become waterlogged easily on the plains, but it works better on higher altitudes. Using this type of soil will not produce good crops because it tends to be very infertile.

The island soils are able to support the Islanders that depend on subsistence farming to survive.The most fertile and agriculturally important of all soils found in Solomon Islands are the recent alluvial soils[15]. The lithology of Malaita is mainly calcareous and fine-grained sediments which most likely contain weathered and leached clayey soils. The soil in Dala area ranges from neutral to alkaline and high in clay. Majority of the soil content comprises of mixed volcanic and calcareous sedimentary material. These soil types usually occupy flood plains and hillsides. Dala soil is fertile, suitable for agriculture.

[14] Selvilla, P., C. The Solomon Islands: Headed for self-destruction, https://www.gdrc.org/oceans/csevilla.html#:~:text=Three%20main%20types%20of%20soil%20found%20on%20the,plains%2C%20but%20it%20works%20better%20on%20higher%20altitudes

[15] Hansell, J., F and Wall J., R, D (1976). *Land Resources of the Solomon Islands*, Land Resource Division Ministry of Overseas Development, England.

4.1.5. Water Resources

Rainfall in Malaita remain high despite the dry seasons. The subproject area comprise of the Dala River situated on the southern side of the solar site. Close to the subproject site were other seasonal streams draining down west towards the coast of Dala North and Dala South. It is noticeable in Malaita that streams and rivers commonly shift to underground table and recur on the lower slope. Shown below in figure 6 were the water resources that run near the subproject solar site.

Figure 6: Seasonal Streams and Rivers near subproject site

4.2. Biological Environment

4.2.1. Forest

Despite the geographical spread of islands and relatively varied flora in the Solomon Islands, the climax vegetation in the Solomon Islands archipelago shows the similarity of appearance between islands. The five major vegetation types that have been identified in the Solomon Islands include:

i. Grassland
ii. Swamps
iii. Lowland Rainforest
iv. Montane Forests

v. Secondary Vegetation

All 5 forest system can be found in Malaita. The original vegetation cover at the subproject area can be categorized as lowland coastal forest due to its proximity to the coastline. The coastal forest here can be characterized as degraded coastal forest from the establishment of the coconut plantation, settlement and subsistence activities.

4.2.2. Terrestrial Flora

The forest and vegetation within the site comprise of mostly trees and scrubs with subsistence gardens. Most of these forest systems have disappeared due to land uses including settlements and subsistence farming. Subsistence gardens within the land areas comprise of potatoes (*Salanum tuberosum)*, cassava (*Manihot esculenta*), and banana (*Musa*) to name few, and cash crops like coconut *(Cocos nucifera),* cocoa *(Theobroma cacao)* which was grown by villagers at the subproject site. Typical vegetation cover at the subproject solar site are shown in figure 7 below.

The immediate subproject solar site is mostly dominated by smaller plants or herbs and scrubs including *species of Macaranga tanarius*, Guinea Grass (*Sorghum haplense*), and creeping legumes *Pueraria phaseloides*. Other species include non-tree ferns.


Figure 7: Typical vegetation, Dala subproject solar site.

4.2.3. Terrestrial Fauna

With the tropical and subtropical environment in the Solomon Islands, it is a home to faunas that can be found nowhere else in the world. The forests of Malaita are known to support considerable number of bird and vertebrate endemism. Terrestrial fauna includes bird species such as the Solomons Cockatoo (*Cacatua ducorpsii*), Yellow-bibbed Lory (*Lorius chlorocercus*), Malaita white-eye (*Zosterops stresemanni*), as well as the Malaita dwarf kingfishers (*Ceyx malaitae*). Reptiles are common especially snakes and geckos and include the brown tree snake (*Boiga irregularis*) which can be found in the tropical environments.

Human settlements and their activities have disturbed the area, thus rendered the area devoid of any significant wildlife to be of much concern. Most of the original vegetation that are critical in accommodating much of the original wildlife have been removed. There is no species of concern found in the site.

4.2.4. Rare and Endangered Species

Solomon Islands is home to rare and endangered species. The island of Malaita has some of rarest and endangered species in the world. The Malaita Honeyeater (*Myzomela malaitae*) is certainly a rare species. It is endemic to Malaita and endangered as its population is facing the risk of extinction due to habitat loss. However, the IUCN have listed it as a near threatened species. The other rare bird species on Malaita is the Malaita fantail (*Rhipidura malaitae*) and Malaita Boobook (*Ninox malaitae*). There are rare and endangered species on the island but are continuously threatened. The subproject site and the surrounding area however, have no rare and endangered species that are of any conservation values.

4.2.5. Protected Areas

Protected areas are defined as geographical spaces, recognized, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with

associated ecosystem services and cultural values. There are about 42 protected around the country. They are managed by NGOs and the local communities, with most are managed through 'community-based resource management' approach as the resources are owned by traditional communities. The government also supported the management of a few of those protected areas. In Malaita, protected area sites are situated in South Malaita. The subproject site has no areas declared as protected under the Protected Areas Act 2010.

4.2.6. Invasive species

Biological impacts from introduced species and invasive species can cause a great deal of damage to naturally adapted systems. Invasive or introduced species are species that are non-indigenous and can colonize and suppress local species. Most of these species are a major threat to ecosystems in the Solomon Islands. Table 3.2 of the State of the Environment Report, 2008 lists 11 invasive plants; 1 micro-organism and 2 aquatic vertebrates/invertebrates. Invasive plants include the usual invasive species such as: *Acacia fanersiana* (Ellinton's curse) *Lantana camara*, *Makania macrantha* (mile a minute vine), *Mimosa invasa* and *Mimosa pudica* (Sensitive mimosa), *Eichhornia crassipes* (Water Hyacinth), etc. These plants have either arrived as agriculture, forestry or as garden ornamentals. The microorganism is *Phytophera colocasiae* (Taro leaf blight), while fish include Tilapia and the mosquito fish. Gastropods include African snail (Lissachatina fulica). The Cane Toad (*Bufomarinus*) is also included in the list. Fire ants (*Wasmania auropunctata*) are now established within the Solomon Islands but have not been noted as an invasive species. Nor is the Paper Mulberry *Broucessonetia papyrifera* which has established itself along roadsides in Malaita.

4.2.7. Tambu Site

According to Forestry Research Timber Untilization Act 2000, "Tambu place" means a Tambu place commonly so called and considered holy, sacred or forbidden by Solomon Islanders

Ancient villages, burial sites, place of worship and the place where heads (skulls) of forefathers are traditionally important to tribal groups in Malaita. Special, sacred or restricted sites, or "tambu" areas, including elements of the landscape as well as monuments, represent the history, lineage and society of different clans and lines and have local cultural as well as regional historical significance. Field site visit and consultation does not reveal any cultural site at the subproject solar site but if there are any identified later during the construction will have to be condone off and responsible authorities informed of the find. Five hundred (500) meters south east of the proposed solar site is a tambu site undisturbed since it holds some importance to the people in Dala.

It is known that bush and forest areas are important for traditional resources (including medicines). The National Solomon Islands Museum keeps a National Tambu Site Register which records several thousand sites. Some provinces also maintain tambu site registers but a lack of funding means that the recording and registration is not systematic.

4.3. Socio-Economic Environment

4.3.1. Beneficiary Population

Malaita consist of the main island Malaita and offshore islands, Lord Howe, Kwai, Sikaiana, to name a few. According to the provisional count released on January 2020 taken from the 2019

census, the population of the Malaita has now reached 173,347 people. The subproject is located in Fauabu Ward that has a population of 8,830 people[16]. According to the provisional count published for 2019 census, the "percentage change" in population for Malaita was calculated at 13.8%. This indicates, the population of Fauabu ward may have now reached 10,000 people. The total population from the SP household survey was 861. However, this accounts for only 18% of the total household in the SP planning report, 2019.

4.3.2 Subproject Neighbour Hood

The subproject neighborhood covers household within 50m radius from the subproject solar site. They might not necessarily be direct beneficiaries of the subproject but are likely to be affected by the subproject activities mainly from construction noise and dust.

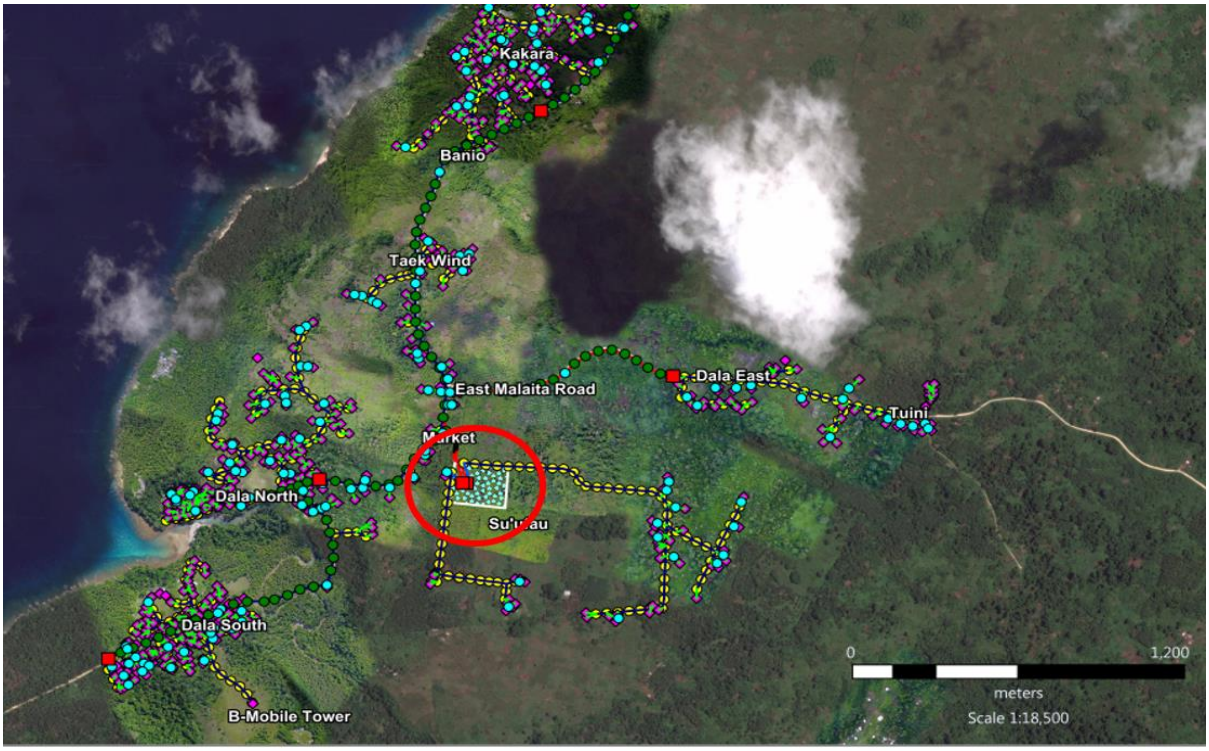

Figure 8: Subproject neighborhood within 50m radius.

4.3.3 Household and standard of living

Dwellings: Dala comprised of permanent houses (concrete piles, timber framing, timber walls, and iron roofs), semi-permanent (timber walls and floors, with a thatched roof) and traditional leaf houses with dirt floors, woven walls and thatched roofs.

[16] Solomon Island Government, Ministry of Finance &Treasury, Census bulletin report 2010.

Figure 9: Typical dwellings, subproject neighborhood

Water: The social survey indicates that 90% of the household have access to water supply (pipe connection) for cooking, swimming and washing. About 8% have harvested rainwater stored in water tank for drinking and cooking. 1% of the household have shared water. Majority of the people use stand pipes. In addition to that, the local population use the nearby rivers for fishing and washing.

SP will install a water tank for domestic use and for on-site safety requirements within the solar site.

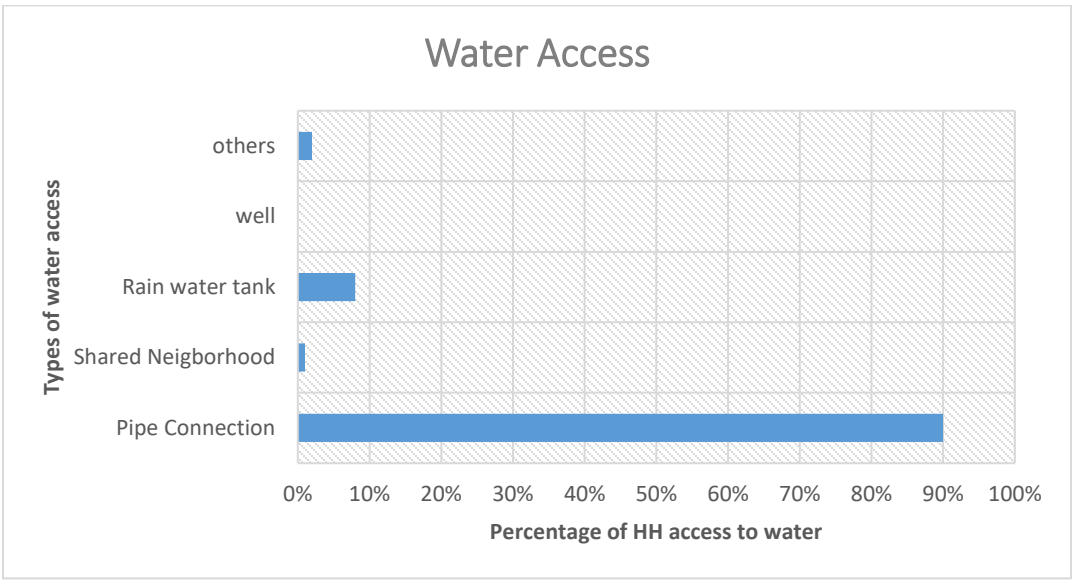

Figure 10: Water access household, Dala

Sanitation: Three percent (3%) of the households use communal toilet, twenty-one percent (21%) toilet outside house, and seventy-six percent (76%) use the bush or beach.

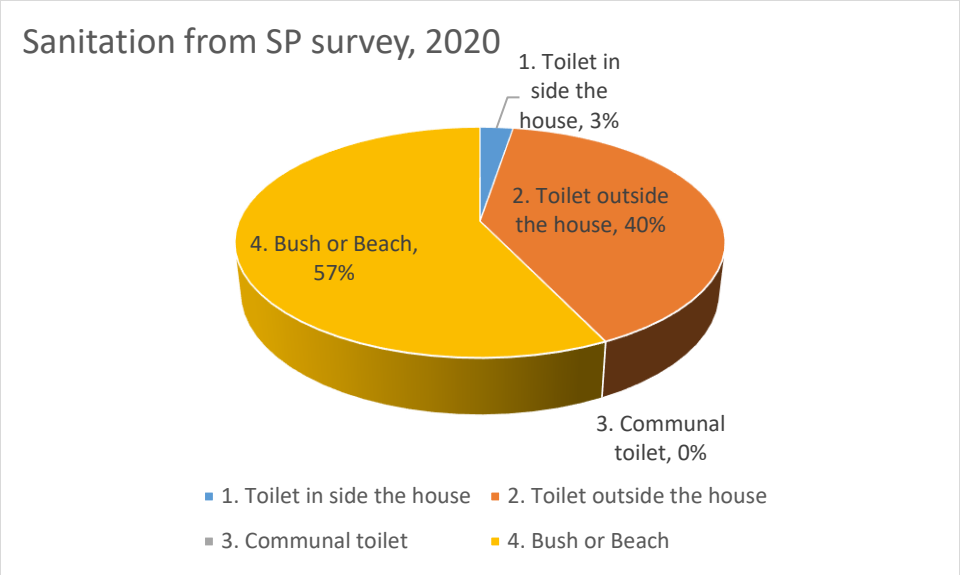

Figure 11: Sanitation

Energy: Most household use solar lighting. Clinics, schools and shops have diesel or petrol generators, however the operation and maintenance of the generators are costly and many organization cannot afford it. Dry cell battery hand torches are common and are used for venturing beyond the house at night. The majority of households (99%) surveyed rely on solid fuel fires (wood, coconut shell, and charcoal) and gas (1%) for cooking and baking. During the SP 2020 survey, no one has reported the use of electricity for cooking.

4.3.3. Community Consultation

Community consultations were conducted at Dala North, Dala south, Kakara, and Takaodo communities. All the other neighboring communities attend, and have also signed the MOU. See Annex 7 for consultation report.

4.3.4. Social Services

Health and Education: There is a hospital at Fauabu Catholic station and Area Health Centre at Dala. The hospital and clinic provide basic and general health care services which include general outpatient, inpatient service, basic emergency, non-communicable disease service and trauma treatment and clinical management of sexual violence and all other basic services. For more serious cases, they either travel down to Auki hospital or to the Honiara national referral hospital (NRH). Figure 12 (right) is the Fau'abu hospital children's ward that provide service for the people around the site.

Most of the villages have kindergarten, primary and secondary schools. The survey indicated that 33% of the population were students between the ages of 5 years to 21 years old. Dala to Fauabu comprise of two Community High Schools, Kakara and Dala Community High Schools. A kilometer to the North of Fauabu is the Kware Community High School. Children from Takaodo and Fauabu communities normally enrolled at Kware Community High School because it is much closer. Figure 12 below shows the Kakara school building under construction.


Figure 12: Kakara School on the left, and Fau'abu Hospital on the right

Building Type	Total
Permanent house	465
Semi – Permanent house	70
Leaf House	246
School building	22
Mini Hospital building	6
Shops or Canteen building	22
Church building	22
Community Hall	8
Ware House	4
TOTAL PROPOSED CUSTOMERS	**865**

Table 2: Types of Building within the site, Dala, Source: Solomon power planning report, 2018

Communication: The subproject area has access to B-Mobile and Telecom communication services.

Transportation: The main mode of transport for the people in the subproject area is by three tone vehicles and private vehicles. Public vehicles provide return trips daily to and from Auki

carrying both cargo and passengers. A taxi can cost up to SBD400-SBD800 from Auki to Fauabu via the Malaita North Road. Apart from land transport, people from the subproject area travel by Out Board Motor (OBM) engines.

4.3.5. Income generations

Malaita is dominated by service roles both commercial and administrative. Economic activities include banking, wholesaling, retailing, motels, and restaurants from small to large scale businesses. The informal sector plays an important role in providing opportunity for self-employment for rural communities and youths. Dala is increasingly becoming a major commercial area for small scale businesses including wholesale, retail, selling of fruits, vegetables, root crops and cooked food.

The SP social survey indicates that 25% of the HH are selling vegetables, root crops, fruits and cooked food for income, 12% depend on monthly or fortnight salaries, 4% generate income through small scale livestock farming of cow, piggery and local chicken, 13% by selling fresh fish on the local market, 10% canteens, 12%from salary and wage, 4% through royalty payments from logging companies and 27% from hunting, milling, and transportation.

Table 3: Sources of income

SOURCES	PERCENTAGE
MARKET	24.7%
FISHING	13.7%
SALARY/WAGES	12.7%
CANTEEN	10.3%
POULTRY/PIGGERY	4.5%
FUEL DEPO	0.3%
ROYALTY	4.1%
HUNTING, MILLING, TRANSPORTATION, CUBIC	27.1%

Figure 13: Dala “Focim Market”

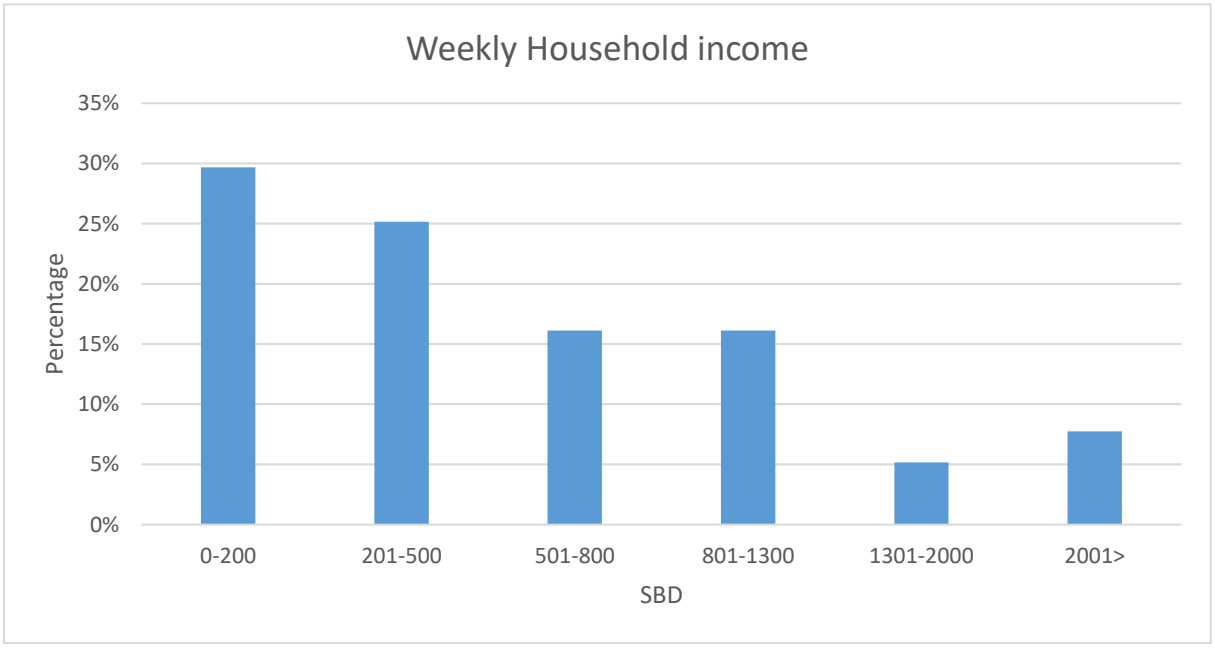

Figure 14: Household income range

Household income: The weekly household income for the 155 household surveyed by Solomon Power are illustrated in the figure 15 above. It shows that, 30% of the HH earned SBD 0-200,

25% HH earned SBD201-500, 16% HH earned SBD501-800 and 29% HH earned SBD801-2001 per week.

4.3.6. Social Organization

Tribal Affiliation: The subproject area comprises of Kwaerae, Tobaita and Fataleka language groups/speakers– three of the major language groups on Malaita. In Malaita, people belong to a tribal group. The tribe consists of multiple named patrilineal clans (sub-tribes). Membership of a particular clan, associated with a 'founding" ancestor, bestows the rights and obligations of an owner of land within the clan's estate. Membership comes from one's father's side, though people recognise cognatic relationships (i.e., from both sides). Technically, every Kwarae, Tobaita and Fataleka person will have rights of ownership (primary rights) to land somewhere in Central Malaita, and through kinship, rights to use land (secondary rights) in several possible areas.

In the past, people lived in hamlets in the mountainous hinterland and on the land they cultivated. However, in the colonial period, they were encouraged to relocate to the coast where they could more easily access government and church- provided education, health services, shops etc. In Malaita, several communities in the hinterland, for example in Kwaio are still practicing in full their cultural traditions and norms.

Leadership: There is a sense of communal affiliation at the subproject area. Just like any Melanesian society, the area does have big men, chiefs and elders who were charismatic leaders or focal points who are able to use their personal abilities and enterprise to organize community activities. All tribal units have chiefs. They are responsible for discussing and resolving tribal issues including matters regarding land and marriage. The subproject site is under the West Kwarae Constituency.

Religion: The entire subproject area by majority are Roman Catholics, Anglicans and South Seas Evangelical Church (SSEC). There is a small establishment of a Seventh Day Adventist Community in one of the village and others referred to in the figure below are Sects.

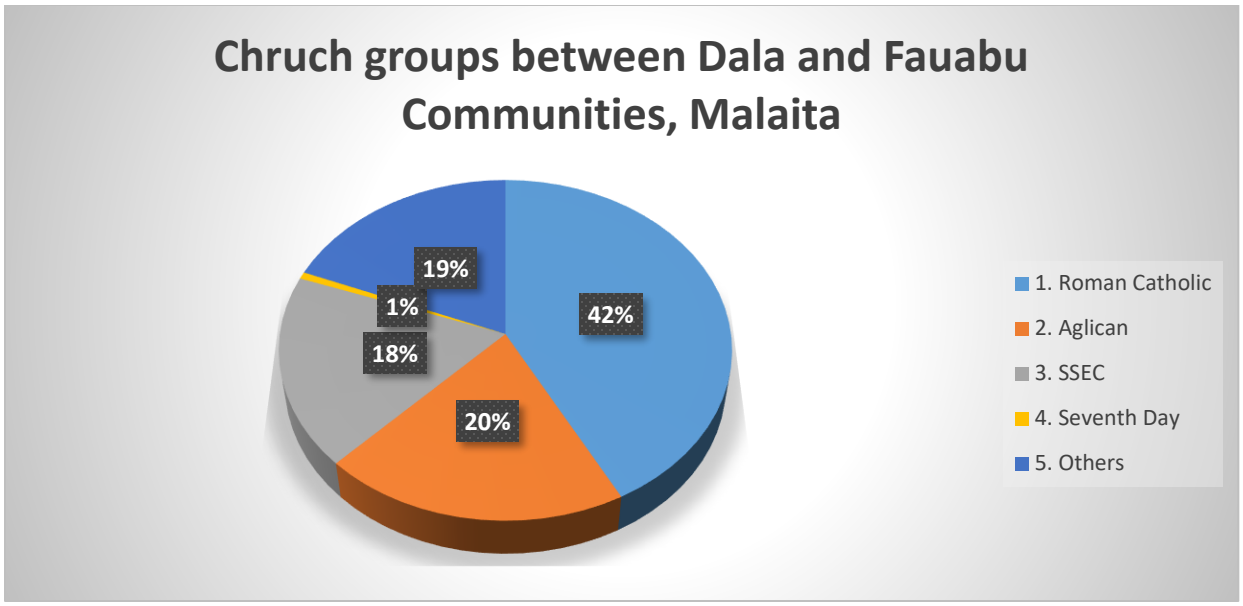

Figure 15: Church groups between Dala and Fauabu Communities

Women, Youth and Gender: The women in Dala to Fauabu villages are part of a church based group. Roman Catholic have sisters (nuns) and a few organized grouping based on village by village. Anglicans and SSECs do have women groups called the Mothers Union and Women's Ministry. The women groups focus on religious commitment but also on "empowering and equipping women with the skills and knowledge to make better decisions on issues that affect their lives and those of their families and communities"[17], and promotes self-reliance and rural economic empowerment. They also organize cooperative activities to improve food security for women and their families. Most youth groups are associated with local churches and majority promote religious activities.

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[17] https://www.spc.int/sdp/70-inspiring-pacific-women/dr-alice-pollard. Retrieved 28 August 2018. See also https://iwda.org.au/case-study-west-areare-rokotanikeni-association-solomon-islands/

5.0 ANTICIPATED ENVIRONMENTAL SOCIAL IMPACTS AND MITIGATION MEASURES

5.1. Significance of Impacts

The potential environment and social impacts for the subproject have been identified, and their significance assessed. The duration of the impacts is assessed with reference to the scope of work and the bio-physical and social environment in the subproject site. Mitigation measures are designed in order to avoid and/or minimize each of the potential environmental and social impacts. Impacts may be minor, moderate, major or negligible based on the scale of impact itself and whether it be mitigated or not.

5.2. Potential preconstruction impacts and mitigations

5.2.1. UXO

During WWII, the subproject site was not a significant spot to the allies. During WWII, some parts of Malaita were subjected to intense battles and while this occurred over 60 years ago, it is possible that a chance discovery of a UXO may occur. Provision in the contract BOQ will allow the contractor to carry out UXO survey prior to any construction work. Should UXO be discovered, the contractor is to immediately cordon off the area arrange the evacuation of nearby residences and inform the RSIPF of the find.

5.2.2. Preliminary designs and design specification

Preliminary designs and design specification will need to be approved by SP and the MPG TCPB to certain extend. The board will issue a building permit or consent for the development to proceed. This process is a legal requirement under the Town Country Planning Act which means it has to be carried out before the construction commences. The concept drawings and route are designed to avoid resettlement impacts and disturbance to vegetation.

5.2.3. Land Acquisition

Solomon Power conducted a valuation of land asset assisted by a registered valuation expert, Malaita Provincial Administration and MLHS, based on the concept drawings. Solomon Power has facilitated the identification of affected landowner, consultations and negotiations with affected people. With the help of qualified experts and the MLHS, SP has completed the survey of the site, and has ensured smooth implementation of the land acquisition. Solomon Power is expecting the land title in June 2022. The land affected by the subproject is registered as FTE. The cadastral boundaries are known as well as the boundary pegs, and the size of the land is accurately recorded and mapped. See consent notice from the Malaita Premier on behalf of the Malaita Provincial Government in annex 9.

5.3. Potential construction impacts and mitigations

5.3.1. Impact on Flora and Fauna

During the construction phase, flora and fauna can be affected but any potential impacts are considered to be minimal as the construction will be performed at previously developed sites. Measures to be included in the subproject to ensure protection of flora and fauna within the site include:

- Adequate knowledge to construction workers in relation to felling of trees, not requiring to be cleared by the subproject;
- Contractor will be responsible for providing adequate knowledge to construction workers in respect of fauna. Prohibit poaching of fauna; and
- Construction workers will be informed about general environmental protection and the need to avoid un-necessary felling of trees outside the subproject area whenever possible.

5.3.2. Impacts on Air Quality

The quality of air within the subproject site is typical of the rural/urban setting in the Solomon Island, i.e. polluted. Traffic fumes are coming from public vehicles on a daily basis. The steady influx of the southeasterly trade winds could remedy the polluted air. The construction works will have a minor and temporary impact on local air quality through emission from construction machineries, as well as through dust generation from vehicles transporting materials and from exposed stock-piles. There are no air quality or emission standards in Solomon Islands, and as the project is not a green-fields development nor is it highly polluting, preparing a baseline for subsequent monitoring is not considered warranted. Total Suspended Solids (TDS), SO_2 and NO_2 gases are expected because of the diesel and petrol fueled equipment. There are a number of good engineering practices that can be employed to ensure that any air quality impacts generated during construction are mitigated. These include:

- Construction equipment being maintained to a good standard. The equipment will be checked daily to ensure they are maintained in working order and the checks will be recorded by the SP as part of environmental monitoring;
- Prohibition of the use of equipment and machinery that causes excessive pollution (i.e. visible smoke) at the subproject sites;
- Provide workers with protective safety equipment including masks;
- Ensuring that all vehicles transporting potentially dust-producing material are not overloaded, are provided with adequate tail-boards and side-boards, and are adequately covered with a tarpaulin (covering the entire load and secured at the sides and tail of the vehicle) during transportation;
- Material stockpiles being located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne; and
- Periodic qualitative air quality monitoring (by observation rather than testing).

5.3.3. Impacts on Water Quality

Water quality can be affected during construction when soils, wastewater, oils and lubricants, sewage and other materials are allowed to move into the environment. Construction activities that may exacerbate the movement of these materials into water environments will be identified and mitigation measures developed. Mitigation measures include:

- Sediment controls such as silt fences or other sediment reducing devices (silt barriers), to prevent both siltation and silt migration when constructions works are being undertaken;
- Minimizing interference with natural water flow within or adjacent to subproject site;
- Solid wastes, debris, spent oil or fuel from construction machinery or plant, construction material, or waste vegetation removed from subproject site will not be dumped in streams or near streams;
- Hydro-carbons, fuel, and other chemicals as required for the works, will be stored in secure containers or tanks located away from the surface waters, or streams and shoreline. Any spills will be contained and immediately cleaned up as per the requirements of the emergency response plan prepared by the contractor; and
- All water, waste-water and other liquids used or generated by subproject works and activities will be collected and disposed of in an approved manner and in an approved location. Such disposal will not be permitted to cause either pollution or nuisance.

5.3.4. Impacts on Soils and Erosion

There will be minor excavation work during construction inside the acquired area to secure platform for the solar farm and associated facilities. Measures will be taken to avoid the movement of eroded soil from the site onto adjoining areas including the worksite. At the completion of work, all disturbed areas will be stabilized by national re-vegetation. Existing patterns of erosion, soil characteristics and topographic conditions were taken into account in the design of the subproject. Certain types of earth works, e.g. clearing can result in sedimentation.

The potential impacts on soil, or from erosion, during construction are from (i) turbidity impact on the adjacent water bodies; (ii) soil erosion and loss of protective vegetation; and (iii) soil contamination from fuel, chemicals and/or construction material spillage. Material stockpiles will be susceptible to erosion, creating sediment laden run-off, particularly during rains and re-suspension of dust during the dry season. Stockpiles will not be permitted near water bodies. Potential soil impacts and erosion will be mitigated by:

- In the event that the contractor causes damage to agricultural land, productive land or gardens, contractor is solely responsible for repairing the damage (It is expected all works carried out on SP registered land);
- Designs used that protect soils in order to reduce erosion; and
- Random and uncontrolled tipping of spoil, or any material, are not permitted.

5.3.5. Impacts on Noise Levels

There are no noise standards in Solomon Islands, and as any noise generated by the subproject will be temporary (i.e. during construction) and intermittent, preparing a baseline of ambient noise levels for subsequent monitoring is not considered warranted.

Construction noise is generally intermittent, attenuates quickly with distance, and depends on the type of operation, location and function of equipment. During construction, there will be a temporary impact due to the noise of the construction equipment, especially heavy machinery when construction activities are carried out close to residents.

Receptor	One Hour L_{Aeq} (dBA)	
	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational[55]	55	45
Industrial; commercial	70	70

Table 4: WB Noise guide

The most sensitive receptors are mainly residential buildings and the Focim Market. It is the responsibility of the contractor to arrange meetings between affected residents and the immediate affected communities on feasible work schedules (hours of equipment operation etc.). Ideally, noise should not exceed 45 dB measured at the outside of any residence. Measures to be included in the subproject to mitigate the effects of noise include:

- Requirements in the ESMP and contract documents that all vehicle exhaust systems and noise generating equipment be maintained in good working order and that regular equipment maintenance will be undertaken;
- Prohibition of any construction activities between 9pm and 6am in, or close to, residential sites;
- Contractor will prepare a schedule of operations that will be approved by affected stakeholders. The schedule will establish the days, including identifying days on which there should be no work, and hours of work for each construction activity and identify the types of equipment to be used;
- Workers will be provided with noise abatement equipment; and
- Any complaints regarding noise will be dealt with by the Contractor in the first instance through the redress grievances mechanism.

5.3.6. Impacts on Access

The subproject will cause disruptions to traffic using the local access during the construction period. Mitigation of impacts on access will include:

- Care taken during the construction period to ensure disruptions to access and traffic are minimized;
- Signage and other appropriate safety features are installed to indicate construction works are being undertaken; and
- Contractor will ensure access roads to private owned land are not disturbed.

5.3.7. Impacts on Health and Safety

The subproject's activities can cause a range of health and safety impacts. The main impacts on health and safety are associated with (i) risk of accidents, (ii) traffic safety issues and (iii) chemical spills. The risk of the spread of communicable disease is considered to be negligible.

Observing general health and safety requirements, including the provision of safety and protective gear and equipment to workers, will reduce the risk of accidents at the subproject site. Air pollution and noise, which also have a health and safety aspect, have already been discussed.

The contractor will need to observe general health and safety requirements and, as a minimum, must be compliant with the Labor Act of 1978, the Safety at Work Act of 1996 and where application the WB/IFC EHS Guidelines. SP Project Engineers will undertake inspection and spot checks weekly to ensure the contractor is complied with the health and safety requirements. The SIG declared a state of public emergency in 2020 to protect the country against the risk of COVID-19 pandemic. All government agencies, including provinces, SOEs, the private sector and communities were required to comply with the SIG COVID-19 protection measures developed and enforced by the Ministry of Health and Medical Services (MHMS) and SIG COVID-19 task force committee. In order to comply with the country's management system, SP contractors have been advised to provide a COVID-19 management plan. This will also be required in all SP future contracts.

Mitigation measures for reducing and avoiding impacts on health and safety include:

- SP and the contractor to provide workers health and safety induction, and on the specific hazards of their work;
- Provide workers with personal protection equipment, such as safety boots, safety glasses, reflector vests, helmets, gloves, and protective clothing and ensure workers adhere to OH&S policy at all times;
- Garbage receptacles will be setup at subproject sites, which will be regularly cleared. The garbage will be dumped only at designated site approved by the communities and the provincial government;
- Provision of adequate protection to the general public in the vicinity of the work site, including advance notice of commencement of works, installing safety barriers if required and signage or marking of the work areas; and

SP/Contractor will issue general and hot work permits at every stage of the work outlining the scope and precautionary and protection measures for example working at height, confined spaces, isolation of electrical equipment/ power-lines

5.3.8. Fire

Smoking near fuel storage areas causing fire and loss to construction resources are expected to be minor. Mitigations measures include:

- Prohibit smoking close to fuel storage areas;
- Erect signage of no go smoking zones; and
- Provide extinguishers and fire hydrants including training workers on their use.

5.3.9. Accidental discovery of archaeological resources

Any site clearance, digging, and excavation activities undertaken during construction can un-earth archaeological sites or resources. In the event this occurs, work shall cease immediately, and the authorities (National Museum Tambu Register, Ministry of Culture and MECDM) shall be informed.

- Activities shall not re-commence until the authorities have signed-off that the site/resources have been dealt with appropriately and that work may continue. The contractor will be responsible for complying with the requirements of authorities, and the SP shall monitor the same.

5.3.10. Emergency Response Plan

The contractor will be responsible for preparation of an emergency response plan in consultation with the relevant organization that will cover containment of hazardous materials, oil spills, and work-site accidents. The plan will detail the process for handling, and subsequently reporting, emergencies, and specify the organizational structure (including responsibilities of nominated personnel). The plan will also consider elements such as access to emergency services and medical treatment and the availability of emergency response resources on site such as medical equipment, fire extinguishers and spill kits etc. including ensuring that the contractor is able to effectively use them.

5.3.11. Impacts on Protected Areas and other Sensitive Ecosystem

The subproject activities will not have any impact on protected areas. The solar site is situated on a coconut plantation and with a small scale operation, the impacts are expected to be minor. There are no sensitive ecosystems. All in all, no impact is envisaged on protected areas and sensitive ecosystem.

5.3.12. Climate Change

Climate change impacts have had the potential to negatively impact the subproject. The majority of risks to solar farm in the country as a result of climate change revolve around the ongoing operation and maintenance of the assets.

The main climate change risk would be related to occurrences of extreme rainfall events and tropical cyclones. Extreme weather events have had the potential to cause damage to the solar hybrid. Fumes from machineries used for the construction work will contribute to emission of greenhouse gases; however, can be considered very minimal and negligible on a global scale. Therefore, the subproject will not have any significant impact on climate change. Risks of impacts on the solar hybrid and associated structures from climate change will be addressed through routine inspections. In addition to repairing solar hybrid components, one of the responsibilities of the contractor will be to report on cases where onsite drainages are failing and to recommend upgrades or additions as required.

5.3.13. Generation of waste during construction

Construction waste comes in solid and liquid form from different construction components. The ECD regulates the discharge of any substances of such kind on the environment. All construction materials whether liquid or solid will be disposed at a designated site approved by the Project Engineer with prior approval from Malaita Province, Landowning Units or ECD.

Segregation of Solid Wastes: Solid is generally understood as solid or semisolid, non-soluble material (including gases and liquids in containers). All other forms of waste except for anything non-solid can be categorized as solid waste. Solid waste represents a majority of the waste produced during the construction. Construction waste will include drums, cables, timber and metal

off cuts and kitchen waste to name a few. The contractor will sort or segregate all solid waste prior to disposal. Willy Bins will be labeled with different waste categories for example “cans, plastic and organic” waste and be installed at designated sites especially at the entrance, campsite and construction area. The contractor’s obligation is to remind construction workers to adhere and comply with the segregation methods and penalize workers who defied the rules established.

Liquid waste management: Liquid waste can be fluids of any form, dirty or clean, toxic or not, can be oil, grease, fats, sewage to name a few. All these are expected during the construction period and will be managed at acceptable standards. Obviously waste oil is common during construction as a result will be stored in a safe location. There is provision for spate toilet at all construction sites.

Where fuel is being transferred from a vehicle, the tank truck must be certified to standard and that all trucks used to transport fuel tanks meet commercial vehicle inspection requirements. There should be signs, indicating that the ignition must be turned off and smoking is not permitted while the vehicle is being refueled and must be visible to every driver. Travelling along highway should be not more than 60km/hr. to avoid accidents. Maintain at least one 20-B:C portable fire extinguisher with the tank vehicle. Refueling equipment from a tank vehicle is permitted if the following conditions are met:

- the fuelling is conducted outdoors on commercial or industrial establishments;
- the fuelling is conducted using approved hose-reel and automatic closing nozzles; and
- appropriate training and equipment are supplied to deal with any incidental spillage.

All storage tanks for combustible and flammable liquids will be built and maintained regularly. There will be thorough inspection for possible leakages and faults. Whenever a problem occurs, a spill response kit capable of containing and absorbing fuel spills are made available and maintained. Company will ensure spills are recovered and that contaminated soil is removed or treated. Post spill response procedures and maintain an emergency response plan with the fuel facility.

Asbestos Removal and Disposal: No demolition works required for this subproject. However, when contact with asbestos, herewith are the management measures. If asbestos fibres are present in the air and are inhaled, there is a risk that they may cause a variety of serious health problems. Asbestos cement products, will be handled with care and through the use of standard operating procedures (SOP) or Material Safety Data Sheets (MSDS). Release of asbestos fibres into the air comes from drilled or cut during construction, especially if broken in the process may release asbestos fibres. A number of good engineering practices will be carried out to avoid such risk:

- Workers familiarise themselves with the type and condition of asbestos cement product that will require removal and disposal of at the site;
- Will obtain approval for an appropriate disposal site prior to demolition;
- Will remove asbestos cement demolition materials immediately from the site to the disposal site without storing it;
- All workers handling the materials are supplied with the appropriate protection clothing and equipment, which are:
  - White disposable overalls to wear during the operation;

- Disposable dust mask suitable for work with asbestos; and
- Disposable gloves.

- Ensure that the following are available at the site:
  - A hose and a supply of water for wetting down materials;
  - A plastic groundsheet that can fully wrap the quantity of asbestos cement sheeting and which will be disposed of with it; and
  - Packaging tap to seal the wrapped sheeting.
- Prevent children, or anyone else who may be affected by the work, from entering the immediate work area;
- Wear a suitable disposable dust mask to prevent inhalation of asbestos fibres; and
- Wear disposable overalls. These should be taken off at the site and disposed of with the AC sheets, these overalls will prevent asbestos fibres clinging to your clothes where they could cause contamination.

Hazardous Waste Management: Hazardous and chemical wastes can be generally referred to as materials either in their solid, liquid or gas states that exhibit a 'hazardous characteristic', usually ignitability, corrosivity, reactivity and toxicity when made in reference to chemicals. It is possible that hazardous chemicals will be used during construction. Hazardous waste materials, such as catalysts, will be returned to the suppliers for specialist disposal. All Hazardous waste shipped from the site will be subjected to waste manifest to track generation, transportation through licensed and approved contractors. The contractor will:

- Store kerosene, diesel, petrol and lubricants in a bunded area with an impervious surface and with stormwater drainage provisions as approved by the Engineer.
- Store paint, and chemicals in a hazardous materials storage shed with walls, roof, ventilation and a bunded floor with an impervious surface;
- Ensure the storage capacity of each bunded area is at least 105% of the total volume of hazardous material stored;
- Secure the areas and sheds used to store hazardous materials by erecting a security fence of minimum height 1.80m around each facility with the fence located outside the bund;
- Locate the hazardous materials storage areas at least 10.0m away from any watercourse;
- Contain and mop up spills of hazardous materials in accordance with manufacturer's specifications.

Waste management training and awareness: SP and the contractor will pursue training on waste management protocols with the construction team before civil works commences. In addition to that, all new staff or visitors will be briefed on the waste management requirements prior to accessing site or visiting site. Workers will be reminded regularly through weekly meetings or daily pre-starts on waste management obligations. The contractor has the right to penalize workers when waste management protocols are not being followed.

5.3.14. Risk of Invasive species

The risk of spreading invasive species is low to medium. It is mandatory for movements of materials and machineries between urbans centers to acquire a clearance certificate from the

Quarantine Division. Responsible authorities will be immediately notified of incidents of invasive species associated with the subproject.

5.3.15. Risk of Spread of Communicable Disease

The spread of STI, HIV and COVID 19 could be a possibility during construction due to influx of workers in the country. Implementation of the STIs/HIV/AIDS and COVID 19 awareness and prevention campaign will be undertaken during the pre-construction phase as well as construction by the contractor.

5.4.16. Employment.

The contractor will employ skilled and unskilled workers. These workers will need temporary shelters and the provision of water, food and basic sanitation during the construction phase. Approximately ten workers are expected; however, it will be confirmed at the detail design stage. SP will ensure equal opportunity for all gender in terms of workforce, whether it is skilled or unskilled labour. Communities nearby will be given priority for all skilled and unskilled work. Payments to women will be equal to the men's salary or wages. The SP team will monitor and ensure contractor complies with gender initiative under the contract.

5.4.17. Antisocial Behaviours.

The subproject-induced influx of workers and an increase in cash in the local economy has the potential to generate antisocial behaviours in the local area, including increased alcohol and substance abuse, Gender-Based Violence and family desertion. This would represent a significant negative effect and would impact disproportionately on vulnerable groups, including women, children and the elderly. It would also impact negatively on living standards, community peace and cohesion in the area. Mitigation measures include: (primarily through recruitment/ employment policies, Code of Conduct, employee training and communications and engagement with and capacity development of women's and other representative groups) through which the increased risk of antisocial behaviours will be addressed.

5.3.18. Social concerns.

A grievance redress mechanism (GRM) is in place for any concerns that the community might have further detail is provided in chapter nine. Key impact on adjacent residential buildings is anticipated to be from the noise produced by the equipment, and other potential social risks include the spread of diseases, COID-19/GBV/SEA/SH risks between the construction team and the residential population, while is deemed minor or negligible the risk can escalate quickly. Appropriate COVID-19/STI/HIV awareness and GBV awareness and mitigation measures are to be set up. The contractor will provide first aid kits, safety equipment for workers and identify a response to any incident related to COVID-19/STI/HIV or GBV. The contractor will be responsible for providing adequate information sessions to better inform the construction workers and the public on matters relating to occupational health and safety (OHS). Appropriate action will be taken to respond to workers behaving inappropriately and under the influence of alcohol at the subproject site or during working hours. Mitigation measures include:

- Contractor to ensure worker's code of conduct is followed and any actions reported through the GRM and

- Adequate information will be provided and made available to all workers to ensure public properties and other important services are not destroyed.

5.4. Potential Operation impacts and mitigations

5.4.1. Community Health Concerns

For concerns that the communities may have regarding safety and accidents. For example, electrocution and skin disease. Mitigation measures will include:

- Potential risks will be identified, evaluated and addressed in a manner that follows the safeguard policies;
- Potential risks will be communicated through forms of community consultations or as deemed appropriate, in particular, risks associated with transmission lines to nearby communities;
- Provision for training made available to local communities to ensure understanding of OHS and social risk awareness is in place during accidents.

5.4.2. Natural Disaster Impacts

Malaita Island is vulnerable to cyclones. Therefore, it is important infrastructures, and utilities are design proof to such conditions. Extreme weather events may cause damage to the distribution line and solar farm. SP will develop an emergency response plan to manage and respond to such events

5.4.3. Climate Change

The risks to the subproject as a result of climate change revolve around the ongoing operation and maintenance of the assets. The main climate change risk would be related to occurrences of extreme tropical cyclones. These events have the potential to damage the solar hybrid, including the poles and distribution lines. Over time, it could lead to tear and wear of distribution lines and associated apparatus. Risk of impacts on the subproject can only be addressed through inspection and routine maintenance works.

Fumes from construction machinery will contribute to the emission of greenhouse gases; however, considered to be negligible on a global scale. Therefore, the subproject will not have any significant impact on climate change.

5.4.4. Health and Safety

Observing general health and safety requirements, including the provision of protective gear and equipment to workers, will reduce the risk of accidents at the work sites. Measures include ongoing training of workers and reviewing Standard Operating Procedures (SOP) to suit condition at the subproject site.

Mitigation measures include:

- Provide workers with training in occupational health and safety (OHS) issues, and on the specific hazards of their work;
- Ongoing training in SOPs; and

- Provide workers with personal protection equipment, such as safety boots, safety glasses, reflector vests, helmets, gloves, and protective clothing.

5.4.5. Management of waste

There is a possibility that the remains of the construction and demolished materials accumulate at the subproject site. The demolished materials and construction materials will be disposed at the designated site approved by SP. These wastes should be removed at the first instance during the construction phase to allow accessibility.

Operation of the subproject will generate wastes including drums, cables, timber and metal off-cuts and kitchen. The contractor will develop a waste management plan as part of its CESMP. Waste management measures will include the following measures:

- Regular collection and disposal of waste at the approved site;
- Regular inspection on oil sumps;
- Waste oil inventory and oil stored in safe containers, careful attention given during overhauls and maintenance;
- Discussion currently being pursued with the ECD on possible export of waste oil.

5.4.6. Sewage and Hydrocarbons

The offices, workshop and related facilities will have piped sewerage connections to a specified septic tank. Sludge shall be stored in holding tanks. The holding tanks will be periodically pumped out and the sludge buried at a suitable location which minimizes the risk of any leaching to water bodies.

Activities likely to cause spillage of hydrocarbons either into land or water shall be undertaken so far as possible in bund areas. In particular, vehicle wash downs, maintenance and refueling, except in emergencies, should take place in workshops and other hardstand areas with appropriate drainage systems, dump, including the capacity to intercept spilt hydrocarbons or oily water; Earth-bund locations within the subproject site where spilt hydrocarbons or oily water can be contained within the bund.

5.4.7. Water Tank

SP ensures the water pumps, tanks and reticulation network are always operational through regular maintenances'. Continuous supply of water is important to subproject site for use in emergency responses as well as domestic purposes.

5.4.8. Impacts on Air Quality

The impacts on air quality during operation of the subproject are negligible unless there is a need for maintenance and the use of heavy machinery. Engineering practices that can be employed to ensure that any air quality impacts generated during operation are minimized includes the following:

- Equipment will be checked at regular intervals to ensure they are maintained in working order and SP will record the checks as part of environmental monitoring; and

- Periodic qualitative air quality monitoring (by observation rather than testing).

5.4.9. Noise

Noise from the operation of the subproject is negligible unless there is maintenance from the use of machinery.

5.5. Decommissioning Impacts

5.5.1. Waste Impacts

Decommissioning of the solar hybrid will result in recycled materials including glass, semiconductor, steel, aluminium and copper. At the end of its operational life, the component parts can be dismantled using minimal impact approach and recycled or disposed of safely. SP will manage all waste according to the SIWMPCS. At this stage, SP is yet to identify oversea companies who would be interested in recycling such waste. Normally ECD will facilitate waste transactions under the Waigani Convention. Following SP and ECD discussions on the issue of waste, SP will explore the viability of exporting solar waste overseas. The company is planning to develop a waste management plan to address the company's operational waste.

5.5.2. Storage sites

Minimal space is available for storage of waste materials unless it is recycled immediately after decommissioning. In Solomon Islands, recycling is a major concern as there are limited to no technology available. Therefore, SP and ECD will have to discuss a prior arrangement for recycling with companies overseas. Alternatively, while discussing disposal methods, a first priority will have to be determined for the appropriate sites for storage.

5.5.3. Access and Mobility

During decommissioning, access and mobility at the subproject site will have minor impacts. The contractor will agree on the work schedule with nearby communities or residential areas before decommissioning activities commence.

5.5.4 Vegetation restoration.

The emphasis will be on the use of local provenance species of native plants and that the emerging vegetation type and composition be similar, or at least close, to that was present before the subproject, at the same time considering vegetation types and densities that will produce a quick coverage to minimize further damage to the environment and restore functional ecosystems, as well as vegetation types of cultural and economic significance preferred by end-users.

5.6. Cumulative impacts

The subproject solar site is located on registered land and was used to be occupied by the Malaita Provincial cattle paddock and coconut plantation prior to the ethnic tension. The construction of the Solar Hybrid system and network will induce insignificant impact on existing processes and the environment. Minor impacts are anticipated since best engineering practices will be adopted.

Noise, fumes and dust at the subproject site during construction and from the operation of the Solar Hybrid in addition to the daily operation of the road and domestic activities are negligible and deemed minor. It is therefore concluded that the subproject activities will not induce or enhance existing negative impacts but rather will increase opportunity for economic development.

6.0 ANALYSIS OF ALTERNATIVES

This section looks at undertaking the various alternatives of the subproject. There are three basic options: (1) Alternative Design and Technology (2) Alternative Site Options (3) leave the subproject as it is now without undertaking the proposed expansion (no subproject option). If the subproject were to continue, it would be necessary to take technical, environmental and social aspects of the subproject into consideration and ensure that these concerns are adequately considered in the decision making. It is therefore important to consider all practicable options and ensure that the best available option(s) is/are chosen. The following section details the development options.

6.1. Alternative to Design and Technology

The contract arrangement is an EPC contract. Therefore, the contractor is responsible for design, procurement, construction and commissioning of the subproject. The installation will be carried out in compliance to SP specification and SOPs for Solar Hybrid installation. The contractor will design and furnish all materials and equipment to be fully compatible with electrical, environmental and space conditions of the site. It will include all equipment to safely support the full demands of the Solar Hybrid system and be designed for unattended operation.

Installation of the solar requires technical machinery and or equipment operated by technically approved people. Localized machinery and equipment may be used as support.

SP had completed concept designs of all poles, conductors and associated apparatus. Pole types are based on the span length, location and geotechnical features of the site. Unlike other initial solar hybrid sites in the Solomon Islands, Dala will have 11kV HV line in its network purposely to allow expansion in the future. The subproject is currently in the concept design stage so it is highly likely that additional information on design alternatives and technologies will be available at detail design stage.

6.2. Alternative Site Options

SP has decided to pursue negotiation on registered land owned by the Malaita Provincial Government. In this case, other alternatives are not feasible to be considered as they will induce major expenses and exacerbate social and environmental issues. Unfortunately, it has been observed that no other realistic alternative, for the location, can be proposed that will provide the same economic, environmental, and social advantage.

Summary justifying why the work will need to be done at the current site:

- Registered land;
- Further away from residential buildings; and
- Access to the road.

6.3. No Development Option

The “No Development Option” implies not proceeding with the subproject rather choosing to leave the site as it is at the current state. This option would likely lead to socio-economic impacts including but not limited to the following:

- Limited energy to meet growing demands;
- Without such expansion, SP will unable to meet SINEP targets set by the SIG;
- Failure to realize that improving energy efficiency will boost the potential for increased income generation through various business undertakings,

In view of the above, it is important to realize that the positive benefits of the subproject will outweigh the potential negative environmental and social impacts. Therefore, the “No Development Option” is not recommended.

7.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Table 5: Environment Social Management and Monitoring Plan

IMPACT MANAGEMENT					IMPACT MONITORING		
Subproject activities	**Potential Environment Impacts**	**Mitigation approaches**	**Responsibility**	**Mitigation cost**	**Parameter to monitored**	**Means of verification and frequency**	**Responsibility**
PRE-CONSTRUCTION PHASE							
UXO Survey.	• Contact with UXO.	• Completion of the UXO survey by qualified personnel.	• Contractor.	• To be include in the BOQ	• Survey been carried out by approved personals	• Certificate showing the subproject area is UXO free	• RSIPF and SP
Development of preliminary designs /site plans / maps.	• Resettlement and damage to vegetation.	• The concept drawings and route are designed to avoid resettlement impacts and disturbance to vegetation.	• Contractor and SP	• To be part of the subproject cost.	• Plans approved by SP	• Building permit	• SP
CONSTRUCTION PHASE							
Vegetation clearance for distribution lines and Solar Hybrid.	• Removal of grass.	• Minimize clearance to construction perimeter only. • Unnecessary clearance avoided. • Contractor to communicate clearance area to workers and monitor clearance activities	• Contractor	• Include in construction cost	• Area of vegetation; area of felled trees/vegetation removal	• During survey and activities - visual inspection before,	• SP

IMPACT MANAGEMENT					IMPACT MONITORING		
Subproject activities	**Potential Environment Impacts**	**Mitigation approaches**	**Responsibility**	**Mitigation cost**	**Parameter to monitored**	**Means of verification and frequency**	**Responsibility**
						during and after	
Operation of construction machinery generating emissions.	• Emission of exhaust from vehicles and machinery. • Emissions of CO^2 and POPs.	• Maintain construction equipment. • Prohibit use of equipment that generates smoke.	• Contractor.	• Inc. in construction cost.	• Air quality, emissions.	• Weekly or after complaint - periodic visual inspection; • Any particulate matter and smoke.	• SP.
	• Dust caused by construction vehicles running at high velocity, • Degrade air quality/ Increase TSS in the atmosphere.	• Thorough watering to avoid dust. • Restrict operations if particulates are causing nuisance to sensitive receptors.	• Contractor	• Inc. in construction cost	• dust, particulate matter; • Use of tarpaulins and loading of vehicles; • Stockpiles.	• Weekly or after complaint - periodic visual inspection.	• SP
Operation of construction machinery creating noise	• Noise to communities and schools.	• Construction machine exhaust systems and noisy equipment will be maintained to minimise noise. • Limit noisy construction activities to day time hours, e.g. Construction activities.	• Contractor.	• Inc. in construction cost.	• Adherence to agreed schedule; • Complaints (no. logged with resolution).	• Weekly or after complaint - review schedule. • Consultation (ensure schedule	• SP • ECD

IMPACT MANAGEMENT					IMPACT MONITORING		
Subproject activities	**Potential Environment Impacts**	**Mitigation approaches**	**Responsibility**	**Mitigation cost**	**Parameter to monitored**	**Means of verification and frequency**	**Responsibility**
		prohibited between 9pm and 6am. • Agree works schedule with stakeholders.				being adhered to).	
	• Impacts on construction workers.	• Workers limit of exposure to noise will be strictly below 70 decibels per 8-hour shift. (See WB guidelines in Table 2) • Provide workers with noise abatement equipment (ear-muffs etc.). • Complaints will be addressed by contractor through the GRM.	• Contractor.	• Inc. in construction cost.	• Workers safety equipment.	• Weekly • Workers are provided with safety equipment.	• SP • ECD
Stockpile of Construction Materials.	• Construction materials washed out into marine environment • Increase siltation and turbidity or receiving environment	• Construction materials will be stockpiled away from the drain and covered. • Placement of diversion ditches around stockpiles.	• Contractor.	• Inc. in construction cost.	• No stockpiling close to water bodies.	• Weekly- Visual Inspection.	• SP • ECD
	• Dust from exposed stockpiles.	• Material stockpiles located in sheltered areas and to be covered. • Water stockpiles as necessary.	• Contractor	• Inc. in construction cost	• dust, particulate matter; • Stockpile covered.	• Weekly or after complaint - periodic visual inspection	• SP

IMPACT MANAGEMENT					IMPACT MONITORING		
Subproject activities	**Potential Environment Impacts**	**Mitigation approaches**	**Responsibility**	**Mitigation cost**	**Parameter to monitored**	**Means of verification and frequency**	**Responsibility**
Excavation works, installation of Solar Hybrid Generation System and distribution lines.	• Risks of accidents.	• Standard Operating procedures (SOP) for instalment correctly executed. • Workers wear personal protective equipment including clothing, helmets, safety boots, earmuff etc. • Completion of a detail OHS risk assessment prior to the commencement of activities. • Instalment of signage boards, markings, barricades where applicable; • Speed limits should be set and a safety audit may be carried out prior to completion of construction to ensure road safety signs are properly implemented. • Contractor to develop a traffic plan as part of the CESMP.	• SP • Contractor	• Inc. in construction cost.	• Workers wore safety equipment.	• Workers are provided with safety equipment. • Daily inspection. • Risk assessment completed and identified controls complied with.	• ECD and SP.
	• Accidental Discovery of UXO.	• Should UXO be discovered, the contractor is to immediately cordon off the area arrange the evacuation of nearby residences and inform the UXO contractor and RSIPF of the find.	• Contractor, SP	• Include in construction cost	• Occurrence of UXO at the construction site	• Upon discovery of UXO	• SP and RSIPF

IMPACT MANAGEMENT					IMPACT MONITORING		
Subproject activities	**Potential Environment Impacts**	**Mitigation approaches**	**Responsibility**	**Mitigation cost**	**Parameter to monitored**	**Means of verification and frequency**	**Responsibility**
	• Silt generation.	• Keep road side vegetation • Use of silt control devices and sediment traps/fences when required. • Construction of sediment settling ponds and bunds. Diverting turbid water to sediment settling ponds. • Implementation of an erosion and sediment control plan. •	• Contractor	• Include in construction cost	• Reduced soil erosion and sedimentation • Vegetation clearance minimized • No dump sites near waterways	• Weekly - visual inspection • Visual inspections during and after rain events to monitor the effectiveness of erosion and sediment control measures.	• SP and ECD
	• Accidental release of hydrocarbon from construction machines.	• Ensure all construction machines are well maintained. • A prestart on construction machine carried out every morning. • Oil/fuel remediation agents, oil pads, oil booms and geo-fabric clothes are procured for usage as part of the emergency response plan.	• Contractor	• Include in construction cost.	• Construction machineries maintain in good working order. • Spot check for visible oil • Water quality.	• Weekly - visual inspection.	• SP and ECD.

IMPACT MANAGEMENT					IMPACT MONITORING		
Subproject activities	**Potential Environment Impacts**	**Mitigation approaches**	**Responsibility**	**Mitigation cost**	**Parameter to monitored**	**Means of verification and frequency**	**Responsibility**
	• Direct discharge to adjacent creeks or streams.	• Development footprint will be provided with effective drainage systems which will avoid direct discharge to creeks or streams/ when the need arises.	• Contractor	• Include in construction cost	• No direct discharge to water bodies	• Weekly visual inspection • SP ECD	• SP and ECD
	• Access and Mobility at several road sections will be prohibited temporarily during the construction.	• Contractor to allow sections of the road area to be continuously accessed by affected party. • Signs and other appropriate safety features will be used to indicate construction works are being undertaken.	• Contractor •	• Include in Contract	• Maintenance of access; • Signage; • Road free of materials and debris; • Haulage routes rehabilitated	• During activities - Visual inspection; • Consultations; • Review of traffic management plan	• SP and ECD
	• Risk of invasive species (e.g. giant African snail spread through materials and machineries	• SP to acquire clearance certificate from MAL quarantine for transportation of machineries and materials between islands.	• SP and MAL	• Include in Contract	• Ensure there are no invasive species associated with the subproject	• Visual inspection and consultation with affected community.	• SP and MAL and ECD
Fuelling construction machines and	• Hydrocarbon leakage / spills from construction sites / workshops.	• Detailed Emergency Response Plan (as part of CESMP) prepared by contractor to cover hazardous materials/oil	• Contractor.	• Include in construction cost.	• Ensure storage sites are using existing.	• Weekly inspection.	• SP and ECD.

IMPACT MANAGEMENT					IMPACT MONITORING		
Subproject activities	**Potential Environment Impacts**	**Mitigation approaches**	**Responsibility**	**Mitigation cost**	**Parameter to monitored**	**Means of verification and frequency**	**Responsibility**
storage of Hydrocarbons		storage, spills and accidents to land and water. • Chemicals will be stored in secure containers away from the water bodies. • Chemicals stored in bund area or compound with concrete floor and weatherproof roof and fire extinguishers. • Protective Equipment (PPE) to workers directly involved in handling hazardous substances. • Ensure all construction machines are well maintained. • Accidents reported to police within 24 hours.			Concrete base.		
	• Spill associated with Hazardous substances.	• Store kerosene, diesel, petrol and lubricants in a bunded area with an impervious surface and with stormwater drainage provisions as approved by the Engineer. • Store paint, and chemicals in a hazardous materials storage shed with walls, roof, ventilation and a bunded floor with an impervious surface;	• Contractor	• Included in construction cost	• Handling of hazardous materials.	• Weekly inspection	• SP

IMPACT MANAGEMENT					IMPACT MONITORING		
Subproject activities	**Potential Environment Impacts**	**Mitigation approaches**	**Responsibility**	**Mitigation cost**	**Parameter to monitored**	**Means of verification and frequency**	**Responsibility**
		• Ensure that the storage capacity of each bunded area is at least 105% of the total volume of hazardous material stored; • Secure the areas and sheds used to store hazardous materials by erecting a security fence of minimum height 1.80m around each facility with the fence located outside the bund; • Locate the hazardous materials storage areas at least 10.0m away from any watercourse; • Contain and mop up spills of hazardous materials in accordance with manufacturer's specifications.					
	• Smoking near storage and workshop areas causing fire	• Prohibit smoking close to fuel storage areas. • Put up signs of no go smoking zones. • Provide extinguishers and train workers on their use.	• Contractor.	• Include in construction cost.	• Signs and fire extinguishers.	• Code of conduct and housekeeping rules being adhered to. • Verify records of accidents	• SP and ECD

IMPACT MANAGEMENT					IMPACT MONITORING		
Subproject activities	**Potential Environment Impacts**	**Mitigation approaches**	**Responsibility**	**Mitigation cost**	**Parameter to monitored**	**Means of verification and frequency**	**Responsibility**
Presence of construction workers	• Waste generated at construction and installation sites causing nuisance and potential contamination to soil and adjacent water bodies.	• Garbage receptacles will be set up at construction sites, and will be collected and disposed every day. • Prepare waste management plan (as part of CESMP). • All wastes from work sites to be disposed of in approved landfill / areas by contractor. • Provide sufficient training in appropriate collection and waste disposal methods. • Collection and treatment of septic waste/temporary toilets during construction phase in accordance with ECD.	• Contractor.	• Include in construction cost.	• Waste management - visual inspection that solid waste is disposed of as per CESMP.	• Monthly, as required and spot checks - visual inspection. • Review of waste management plan.	• SP and ECD.
		• No wastes to be dumped in waterways. • Ensures wastes not discharged to rivers or coastal waters and that all wastes disposed of in proper areas. • Provide adequate and safe drinking water.	• Contractor	• Include in construction cost	• No direct discharges to local streams, coast or rivers; • Regularity of waste removal	• Visual inspection Weekly	• SP and ECD
	• Possibility of conflicts or antagonism between the public and the workers	• Facilitate reconciliation between parties- affected person, Contactor to involve in resolving the issue.	• Contractor	• Include in constr	• No. concerns raised and resolution;	• Ongoing - consult with public to monitor	• SP and ECD

IMPACT MANAGEMENT					IMPACT MONITORING		
Subproject activities	**Potential Environment Impacts**	**Mitigation approaches**	**Responsibility**	**Mitigation cost**	**Parameter to monitored**	**Means of verification and frequency**	**Responsibility**
		• Call the Police once it goes beyond control.		uction cost	•	environmental concerns.	
	• Risk of contractor engaged in GBV	• All workers will be required to undertake GBV trainings and sign the associated code of conduct prior to commencement of civil works.	• Contractor	• Include in construction cost	• Zero GBV tolerance.	• Incident reports and consultations.	• SP
	• Climate Change and Natural disasters.	• Inspection and maintenance. •	• Contractor	• Include in construction cost	• Equipment failure	• Weekly inspection and after every storm.	• Contractor.
OPERATIONAL PHASE							
Operation of Solar Hybrid System	• Impacts from maintenance machineries	• Maintain machineries at standard working condition • Safety PPE for workers. • Workers carrying out maintenance are trained to avoid electric shocks. • Completion of a risk assessment and implementation of SOPs.	• SP	• Include in operational cost.	• Air quality, emissions.	• Monthly or after complaint - periodic visual inspection. • Any particulate matter and smoke.	• SP
	• Accidents (involving electric shocks and burning).	• All SP workers and contractors are trained and certified.	• SP.	• Operational cost.	• Zero incidents.	• Incident reports.	• SP.

IMPACT MANAGEMENT					IMPACT MONITORING		
Subproject activities	**Potential Environment Impacts**	**Mitigation approaches**	**Responsibility**	**Mitigation cost**	**Parameter to monitored**	**Means of verification and frequency**	**Responsibility**
		• All households are wired by grade A licence contractor. • Advise communities during awareness to report to SP and Fire services of any burning incidents.					
	• Public safety on the use of electricity.	• Community Education and awareness at the preconstruction, construction and prior to commissioning of facility. • Awareness conducted at schools, church and institutions. • Awareness through media.	• SP.	• Operational cost.	• Zero Incidents.	• Incident reports. •	• SP.
	• Establishment of the network infrastructure throughout the district will introduce more roadside obstacles and the potential for collisions.	• Road safety assessment (majority of the poles will be within the road corridor and supposed to be 4m from road pavement-SP will avoid encroaching into people lands). Traffic in the area is lower and does not seem to pose any risk to the poles. Unless people are drunk which is law and order issue.	• SP.	• Operational cost.	• Zero Incidents.	• Incident reports.	• SP.
	• Road Accidents and safety of women associated with no street lamps.	• There are provisions to install streetlamps on its distribution network for the sake of community safety,	• SP.	• Operational cost.	• Budget for installation of street lamps.	• Installation of street lamps.	• SP.

IMPACT MANAGEMENT					IMPACT MONITORING		
Subproject activities	**Potential Environment Impacts**	**Mitigation approaches**	**Responsibility**	**Mitigation cost**	**Parameter to monitored**	**Means of verification and frequency**	**Responsibility**
		however not at this stage. Assessment on suitable location for street lights will commence soon after the subproject.					
	• Waste generated at solar (Solid waste) old batteries	• Garbage receptacles will be set up at construction sites, which will be regularly cleared by the SP. • SP to prepare waste management plan. • All wastes from work sites to be disposed of in approved landfill / areas by SP. • Workers will provide sufficient training in appropriate waste disposal methods.	• SP	• Include in operational cost.	• Waste management - visual inspection that solid waste is disposed of as per CESMP; • Visibility of oil and fuel.	• Monthly, as required and spot checks - visual inspection; • Review of waste management plan. •	• SP and ECD
DECOMMISSIONING							
Dismantling the solar hybrid	• Solar waste	• SP will manage all waste according to the Solomon Islands Waste Management and Pollution Control Strategy. At this stage, SP is yet to identify buyers of solar waste. Normally ECD will facilitate waste transactions under the Waigani Convention. Following SP and ECD discussions on the	• SP	• To be part operational cost.	• Solar Panels and associated E-wastes.	• During decommission.	• SP/ECD

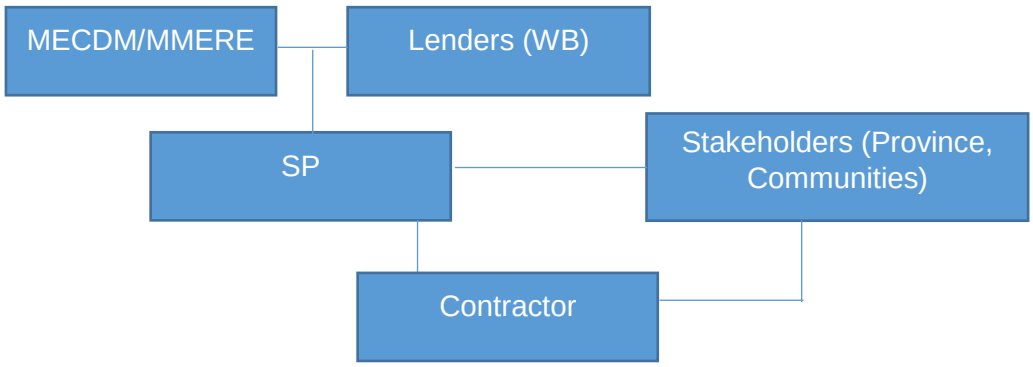
IMPACT MANAGEMENT					IMPACT MONITORING		
Subproject activities	**Potential Environment Impacts**	**Mitigation approaches**	**Responsibility**	**Mitigation cost**	**Parameter to monitored**	**Means of verification and frequency**	**Responsibility**
		matter, SP will explore feasibility of exporting solar waste overseas. ECD recommend that SP discuss with a Fijian company on batteries disposal.					
	• Storage of waste materials to certain extend can occupy space, unless they are recycled or removed immediately after decommissioning.	• Storage facilities spaces and secure.	• SP	• To be part operational cost	• Storage facility	• After decommissioning	• SP/ECD
	• During decommissioning, access and mobility at the subproject site will have minor impacts.	• SP will agree work schedule with the community before decommissioning activities commences.	• SP	• Operational cost	• Road access, signage	• During decommissioning.	• SP/ECD.
Dismantle of standby generator and fuel tank.	• Spillage of oil and fuel.	• Ensure standard operating procedures for dismantle of generator and tank are in place. • All fuel and oil from generator pumped into drums before lifting to vehicle.	• SP	• Operational cost	• spillage	• During decommissioning.	• SP/ECD.

7.1. Institutional Arrangement

This section identifies implementation arrangement for managing environment and social impacts, mitigations and reporting.

The overall organizational structure for environmental and social management for the subproject is shown Fig 16 below.

Figure 16: Organizational Structure for Environmental Social Management



7.1.1. Solomon Power

The overall management of all monitoring and inspection tasks comes under the SP. This covers all aspects of the required activities including coordination with other agencies that have national responsibilities over some of the tasks. The company is responsible for general subproject execution and with day-to-day subproject management activities, as well as monitoring.

SP will include key performance indicators in the contract regarding the Contractor's environmental, social and health and safety performance. SP is responsible for compliance monitoring during construction and operation of the subproject. The ECD will also be responsible for verifying the monitoring undertaken by the SP through audits and spot-checks. The outcomes of the monitoring will be included in the monthly progress report.

SP, through the Capital Works Department general manager is the key contact for the subproject. The department is responsible for the delivery of capital programs aimed at expanding and developing SP's position to meet future demands and challenges. It is supported by operational and engineering departments to ensure reliable, efficient and safe delivery of energy. Three safeguards officers were recruited in 2022 to manage and implement SP safeguards project activities. SP responsibilities include:

- Preparation of screening reports, proposal applications, Environment Social Management Plans and Public Environmental Reports for subprojects as required to meet requirements of the Environment Act 1998 and WB Policies;

- Arrange public consultation to advise affected communities of the scope and scheduling of the subprojects;

- Arrange for ESMP/PER to be attach to Bid Document;

- Arrange for reports to be sent to the MECDM and WB for evaluation. Following approval by the MECDM and the issuing of permits/approvals advise the SP and WB of the approval;

- Evaluate and approve the CESMPs prepared by the contractors as a condition of the contracts;

- Assist the management of GRM; and

- Undertake regular site visits to independently monitor the contractor's compliance with the CESMP.

7.1.2. Contractor

The contractor is responsible for preparing a CESMP at the construction stage and during implementation that is aligned with this plan and also informed through a risk assessment, whenever additional engineering information is available. These includes an emergency response plan, health and safety plan and waste management plan as part of their CESMP. The contractor will also be responsible for implementing all environmental, health and safety actions included in the CESMP. As a condition to contract, contractor will recruit an environmental safety officer (ESO) whose responsibilities will include:

- Coordinating with SP for preparing the CESMP;

- Provide training and awareness on environment, health and safety.

- Undertake STIs, HIV/AIDS, Malaria, Dengue, GBV, SEA and COVID-19 briefings and awareness raising amongst the contractor's employees;

- Contractor complies with the clauses in the contract and bidding documents in respect of environment, health and safety;

- Ensuring the contractor does not commence construction activities until requisite approvals have been received from ECD, provincial authorities and SP;

- Participating in monitoring with SP to ensure environmental, social management and health and safety activities are reported as required;

- Produce monthly environment, social and health and safety monitoring reports to SP; and

- Facilitating consultation with the affected stakeholders and ensuring smooth implementation of the subproject.

7.1.3. Ministry of Environment Conservation, Climate Change, Disaster Management and Meteorology (MECDM).

As the national agency responsible for environment and conservation, the ECD under MECDM will need to be involved in the various aspects of the subproject. Under the requirements of the Environment Act 1998, the ECD will need to review the ESMP/PER and monitor the progress of construction. The ECD has been fully informed of the status of the subproject and also awaits the submission of the ESMP/PER. The ECD will review and issue development consent for the subproject.

7.1.4. Ministry of Mines, Energy and Rural Electrification (MMERE)

The Mines and Energy Division (MED) under MMERE is responsible for ensuring the smooth implementation of the subproject. The MED from time to time will carry out inspections ensuring subproject indicators are implemented on time, specification and national requirements are effectively executed. SP will need to seek BMP approval from the ministry for sourcing gravel at any location, however not at this stage. The MED will also be responsible for coordinating this requirement with other departments in the ministry for quick review and approval of the BMP.

7.1.5. Malaita Province

The provincial assembly is the governing arm of the province. The MPG TCPB shares an important role in approving development plans to certain extend. SP is responsible for liaising with the Provincial planning division for consent. A building permit is tendered when a plan is being approved by the board or assembly. The consent from the premier is sufficient for this purpose at this stage. See annex 9. The Province will provide:

- Endorsement on crops and trees affected by the subproject; and
- The province through the agriculture extension officer will provide support to SP during the detail crop inventory and consultation with affected communities/person.

7.1.6. Royal Solomon Islands Police Force

The subproject site may not be a major battle ground during WWII. However, provision in the contract BOQ will allow the contractor to carry out UXO survey prior to construction and during construction. Should UXO be discovered during the construction, the contractor and SP are to immediately cordon off the area, arrange the evacuation of nearby residences and inform the RSIPF of the find.

7.1.7. Communities

Dala to Fauabu comprise of nine main villages with tribal chiefs, village chiefs, church leaders and women. Tribal chiefs and community elders are required to facilitate discussion with their tribes on easement for transmission and distribution lines. Provide support to SP on GRM issues, identifying landowners, signing the MOU and ensuring smooth implementation of the subproject. The interest of SP and the SIG is to see successful completion of the subproject with equal participation from the communities and its stakeholders.

7.1.8. Land Trustees

The key Perpetual Estate Contact for the subproject are the two trustees, Andrew Billy and Ronaldo Lobowane. Both of them are the key contacts for land matters regarding the proposed

subproject solar site and are responsible for communicating the development to their tribal members. They have submitted consent letter for SP to develop the subproject site. The trustees' responsibility include:

- Ensure land lease is within the subproject timeframe;
- Ensure necessary documents for transfer of land is available;
- Provide continuous support to the subproject during construction and when it is operational.

7.2. Environment Monitoring and Reporting

Monitoring is a component of an impact assessment that combats uncertainties pertaining to unanticipated impacts, to ensure mitigation measures are working and to reassure public on the progress of the development. Progressive monitoring must accompany various stages of the subproject activities (construction and operational phase). The environmental social monitoring plan is based on the potential impacts, significance of the impacts and mitigation approaches identified during the screening. It comprises of parameters to be monitored, frequencies and responsible authorities as per impact. The contractor is required to prepare a detailed environment social and health and safety monitoring plan based on Table 5 in consultation with SP. ECD is responsible for monitoring compliance, reviewing the company's monthly monitoring report and suggesting ways to improve or strengthen mitigation approaches. A monitoring checklist is in Annex 3.

Table 6: Responsibilities for Environmental Social Management & Monitoring

Project Stage	Responsible Organization	Responsibilities
Feasibility studies and appointment	Solomon Power	• Prepare ESMP/PER including overall ESMP (Table 5) • Preliminary design
Feasibility studies and subproject review and approval	ECD	• Review and approval of ESMP/PER including overall ESMP (Table 5)
Detailed Design	Contractor	• Prepare detailed design and specification • Submit design to SP for approval • Prepare CESMP based on specifics of detailed design • Submit CESMP to SP for review and approval
	SP	• Approve the Contractor's detailed design and specification and CESMP
Construction	Contractor	• Implementation of CESMP • Submission of monthly reports to SP • Provision of awareness/training to workers • Regular Safety awareness as part of tool box meetings (covering OH&S, PPE and safety signs displaying work progress) • Consultation and awareness to workers on code of conducts and management of communicable diseases
	SP	• Supervise implementation of CESMP • Audit construction phase through environmental and OHS inspections and review monitoring data
	ECD	• Audits and spot checks

Project Stage	Responsible Organization	Responsibilities
Operation	SP	• Provide budget to undertake environmental monitoring • Undertake environmental monitoring and prepare bi-annual reports • Prepare maintenance reports to adaptively manage environmental risks related to operations (as per ESMP/PER) • Complete preventative maintenance to prevent environmental, social and OHS incidents and nuisance.
Decommissioning	SP	• Ensure all waste associated with decommissioning is disposed in a manner accepted by ECD. Provide budget for waste export. • Consult with ECD who will provide options on disposals and processes.
	ECD	• Provide support to SP on Waigani Process and other conventions on export of waste.

7.3. Training.

SP and contractor will conduct the environment, social, health and safety training for all workers prior to construction commences. The training will prepare workers to manage and protect the environment, to manage any potential social impacts and to ensure the safety of the public and the construction team.

7.3.1. Environmental and Safety Induction Training.

Mandatory, all workers attend the Environmental Safety Induction Training. The training covers legislation and regulations, policy, organization structure, duties and responsibilities, mitigation measures, targets in the ESMP and housekeeping rules/guidelines. The major topics will include air pollution control; waste management; vegetation clearance controls, health and safety; handling of hazardous substances, emergency preparedness; and, first aid training.

7.3.2. Environmental and Safety Toolbox Talk.

In addition to that, all workers will attend the weekly environmental and safety toolbox talk. The purpose of the talk is to rectify lesson learnt and re-emphasizing the importance of environment and safety procedures. The Environment Safety Officer will update all workers when Standard Operating Procedures (SOP) is being developed or reviewed.

7.3.3. Refresher training.

There is provision for refresher training on specific topics. These can be done annually depending on the nature of the work and approval from the SP management.

8.0 PUBLIC CONSULTATION AND PARTICIPATION

8.1. Stakeholder.

The stakeholder can be categorized as; i) primary stakeholders are the people, landowners, resource owners in the subproject area ii) government authorities including MLHS and Malaita Provincial Administration iii) other interested groups. Refer to Annex 8 for the consultation report.

8.2. Consultation.

Information regarding the subproject objectives, processes and timeframes were disclosed to communities during initial consultation meetings. Specific consultation and meetings were held with the affected persons regarding crop removals and compensation payments for these losses. The affected people were informed during initial discussions and will again at detailed design stage of their rights to be compensated for any losses to their properties at full MAL rate. There will be ongoing consultation and meetings throughout the implementation of the subproject.

Whilst preliminary discussions have been initiated with the land users and affected persons, about the subproject, negotiation processes for land acquisition has already been finalized. Future consultations will focus on a detailed census of AP. Solomon Power and the Provincial Government have formally verified land users and their ownership of trees, crops, and other assets, as a basis for claiming compensation. It should be noted that initial consultations have been largely with the subproject communities, service providers in health and education, and some land users. All women land users supported the subproject and said that there was sufficient gardening land elsewhere, if the subproject site had to be constructed on some gardens or plantation.

8.3. Results of Consultations

The main issues raised during the village meetings can be distilled into common themes:

Table 7: Consultation issues and measures suggested

Communities	Questions	Responses
Dala North Community	Public Safety. Is it safe for the public?	Safety signs will be placed on site during construction. The SP OHS team will provide safety trainings prior to construction on the use of electricity, management of electricity, what to do during incidents and who should we call during incidents. It is important to respect SP assets.
	Is it possible to connect electricity to a leaf houses?	Yes, it is possible on the condition that it meets the specification standards and does not leak or be able to withstand extreme weather events.
	Is the power free or some charges imposed for landowners?	Tariff is the same for both urban and rural areas. SP is a state owned enterprise

		(SOE) and it operates under the electricity act. SP must make income in order to sustain its operation and expand the network to other rural communities in the country.
	Does our land or trees compensated if SP uses that piece of land for its poles or cut a tree down during clearance?	SP does not acquire the location of poles and network corridors. SP will sign a Memorandum of Understanding (MOU) for easement of the network. Crop compensated will be based on MAL rates.
	Can SP install streetlights?	The scope of the subproject does not include streetlights at this stage.
	Nearest cash power office.	Auki is the nearest cash power office. There will be a SP office in Dala station to provide the cash power service.
Dala South Community	What tools should I use to get someone out if he/she is subjected to electric shock?	It is important to maintain distance from the scene and call the nearest SP office for assistance. Use nonmetal object only when it is safe and is it appropriate for the situation.
	How do SP deal with development on customary lands?	SP acquire sites for SP development according to the Solomon Islands Lands and Tittle Act. SP network will pass through customary lands.
Takaodo Community	Are there provisions to lower the tariff (rate) for rural communities?	Tariff is the same for both urban and rural areas. SP is a state owned enterprise (SOE) and it operates under the electricity act. SP must make income in order to sustain its operation and expand the network to other rural communities in the country.
Kakara Community	If SP Solar hybrid is operational, can we still use our mini-solar panels for light?	Yes. The power will be available but you can still use the mini-panels.
	Is it safe for our children and community?	SP will ensure the solar hybrid and network meet the safety standards. The SP OHS team will provide safety trainings prior to construction on the use of electricity, management of electricity, what to do during incidents and who should we call during incidents. It is important to respect SP assets.

9.0 GRIEVANCES REDRESS MECHANISM

Any concerns, issues or grievance during the course of the subproject will be addressed in a transparent and timely manner, and without retribution to the affected person (AP)[18]. These concerns may pertain to the subproject's environmental performance or social risks.

An initial process has been set up to address any issues and/or problems raised directly at the subproject level in the first attempt. However, if this cannot be resolved, then the grievances will be addressed through a mechanism of referral to ECD within the MECDM. The GRM process and forms will be made available to all households within the subproject area.

9.1. During construction

It is anticipated, that during the construction phase, most complaints that may arise are expected to be minor complaints regarding dust, health & safety and noise, land restrictions and can be resolved with community support. All complaints received at the site office are to be entered into a registry kept on the site, this includes information such as date, name, contact address and reason for the complaint. A duplicate entry copy is given to the AP for their record when the complaint is registered. The register will indicate the party responsible for resolving the complaint and the date when this was made together with the date the AP was informed of the decision and how the decision was given to the AP. The register is then signed off by the person responsible for a decision to be made and dated. The register must be kept at the front desk of the contractor's office, and it is a public document. The copy given to the AP will show the procedures for assessing the complaint with a statement affirming the AP rights to make a complaint. There are no costs involved when applying to AP for raising a complaint.

Complaints received by the contractor are discussed directly with the SP Project Manager. For straightforward complaints, the PM can make an on-the-spot determination to resolve the issue. For complicated complaints, the PM will forward the complaint to the SP Management. The Management has five days to resolve the complaint and make a decision to the AP. If the AP complaint is dismissed, the AP will be informed of their rights to take it to the next level. A copy of the decision is to be sent to the ECD, MED and relevant authorities.

If the AP is not satisfied, the complaint can be taken to the ECD Director, who will appoint the ECD Officers to review the complaint. The Director will then have 15 days to make a determination.

9.2. During Operation and Decommissioning

During operation, the same conditions apply; i.e., there are no fees attached to the AP for making a complaint, the complainant is free to make the complaint which will be treated in a transparent manner.

[18] *Affected Person (AP) refers to anyone affected by the development, can be an organization or government agency.*

10.0 CONCLUSION

The study shows that there are no significant environmental and social impacts associate with the subproject and the ESMP has described mitigation measures to ensure that all impacts can be mitigated to environmentally friendly levels. No significant flora or fauna, nor will any conservation, cultural or heritage sites be affected.

Prior to commencing construction, the contractor will prepare a CESMP when further engineering details are available. During construction, SP will be responsible for monitoring and supervising compliance with the CESMP.

The subproject has minimal impacts, none of which are catastrophic, all of which can be satisfactorily mitigated. Based on the above, it is concluded that environmental social impacts arising from the subproject can be minimized to minor levels. There is no need for further assessment or EIS.

11.0 REFERENCES

Francis, S., L and Alama L (2011).*World War II Unexploded Ordnance*, Retrieved at URL on 29thof October 2013 at URL: http://www.forumsec.org/resources/uploads/attachments/documents/UXO%20final.pdf.

Green, A., Lokani, P., Atu, W., Ramohia, P., Thomas, P and Almany M (2006), *Solomon Islands Marine Assessment*, Honiara: The Nature conservancy.

Hansell, J., F and Wall J., R, D (1976), *Land Resources of the Solomon Islands*, Land Resource Division Ministry of Overseas Development, England.

James, J (2018), *Solomon Power Henderson 1MW Solar Farm: 2MW expansion*, Honiara: Solomon Power.

MECM (2008), *State of the Environment Report 2008*, Honiara: MECM.

MECM (2010), Environment Impact Assessment Guideline, Honiara: MECM.

Musgrave, R. J. (2013). Evidence for Late Eocene emplacement of the Malaita Terrane, Solomon Islands: implications for an even larger Ontong Java Nui oceanic plateau. *Journal of Geophysical Research: Solid Earth*, *118*(6), 2670-2686.

Moore, C. (2017). *Making Mala: Malaita in Solomon Islands, 1870s–1930s*. ANU Press.

SIG (1999), *Solomon Islands Environment Act 1998*, Honiara: Solomon Islands.

SIG (2011), Solomon *Islands Fourth National Report to the Convention on Biological Diversity*, Ministry of Environment, Conservation and Meteorology, Honiara: Solomon Islands.

SIG (2011), *Solomon Islands National Statistics Bulletin 06/2011, Report on 2009 Population and Housing Census, Basic Tables and Census Description*, Honiara: Solomon Islands.

UN Habitats (2012), *Honiara Urban Profile*, Retrieved on the 5th August 2013 at URL: http://www.google.com.sb/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=2&ved=0CCwQFjAB&url=http%3A%2F%2Fwww.unhabitat.org%2Fpmss%2FgetElectronicVersion.asp%3Fnr%3D3324%26alt%3D1&ei=ei4EUqSJEseeiQKeuYGYBg&usg=AFQjCNHeIf11t_1NdrxxnoivuFA-L2bzCg.

ANNEX

Annex 1: Multilateral Agreements

Multi-lateral Agreements that the Solomon Islands is a party to Convention or Treaty	Status	**Purpose/Aim**	**Agency Responsible**
Regional MEAs			
i. Pollution Protocol for Dumping	Ratified 10/9/98	Prevention of pollution of the South Pacific region by dumping	Marine Div/ECD
ii. Pollution Protocol for Emergencies	Ratified 10/9/98	Cooperation in combating pollution emergencies in the South Pacific region.	Marine Div/ECD Project: National Pollution Prevention Plan
iii. Natural Resources & Environment of South Pacific Region (SPREP Convention)	Ratified 10/9/98	Protection of natural resources and environment of the South Pacific Region in terms of management and development of the marine and coastal environment in the South Pacific Region.	ECD
iv. Waigani Convention on Hazardous & Radioactive Wastes 1995	Ratified 7/10/1998	Bans the importation of hazardous and radioactive wastes into Forum Island countries and to control the trans-boundary movement and management of hazardous wastes within the South Pacific region.	ECD
Chemicals, Wastes and Pollution			
i. Liability for Oil Pollution Damage	Ratified	Strict liability of ship owner for pollution damage to a coastal state within a certain amount.	Marine Div
ii. Marine Pollution Convention (London)	Ratified	Prevention of marine pollution by dumping of wastes and other matter.	ECD/Foreign Affairs
iii. Desertification (UNCCD)	Acceded 16/4/1999	Agreement to combat desertification and mitigate the effects of drought in countries experiencing drought or desertification.	Agriculture Div/ECD Project: National Action Plan on Land Degradation and Drought; National Capacity Self-Assessment (NCSA)

iv. POPs Convention (Stockholm)	Acceded 28.7/2004	Protection of human health and environment from persistent organic pollutants.	ECD/Environmental Health Div. Project: National Implementation Plan
Biodiversity			
i. CITES	Instrument of ratification being prepared	Regulations and restriction of trade in wild animals and plants through a certification system of imports and exports.	ECD
ii. World Heritage Convention	Acceded 10/6/1992	Protection of sites of Outstanding Universal Values. Solomon Islands currently has East Rennell Island as a World Heritage site.	Museum/ECD
iii. Convention on Biological Diversity (UNCBD)	Ratified 3/10/1995	Conserve biological diversity through the sustainable use of its components and the fair and equitable sharing of the benefits arising out of utilizing genetic resources.	ECD Project: NCSA; National Biodiversity Strategy and Action Plan; International Waters Program; 3rd National Report
iv. Cartegena Protocol	Acceded	Protection of human health and the	ECD

Annex 2: Other important Legislation

Act	Date	Main objectives
River Waters	1973	Control of river waters for equitable and beneficial use; establishes activities for which permits are required.
National Parks	1978	Establishes national parks; establishes restrictions on use and provides for appointment of park rangers.
Wild Birds	1978	List scheduled birds for protection. Establishes bird sanctuaries and strict hunting season for several birds.
Agriculture and Livestock	1982	Applies to agricultural and livestock industries. Defines noxious weeds and their control.
Forest Resource and Timber Utilization	1991	Governs licensing of felling of trees and sawmills; timber agreements on customary land. Establishes State Forest and Forest Reserves and management systems. The Forestry Bill 2004 seeks to replace the Act and provide more control in conservation of forests and improved forest management.

Fisheries	1998	Framework for fisheries management and development, including licensing of fishing vessels and processing plants. Lists prohibited fishing methods, provides for establishment of Marine Protected Areas (MPAs) and coastal management plans.
Provincial Government Act,	1997	The Provincial Government Act of 1997 gives power to the provinces to make their own legislation including environment and conservation. Schedule 3 of the Act provides a list of activities for which the provinces have responsibility to pass ordinances. The State of the Environment Report (2008) shows that eight provincial ordinances have been passed which include: o one environmental protection ordinance, o six wildlife and wildlife management and conservation area ordinances, and o one marine and freshwater ordinance.
Labour Act	1978	This Act deal with employment of workers. Part IX Care of Workers, requires the employer under: o Article 65: to provide workers with rations. o Article 66: to protect workers and dependents from malaria. o Article 67: to provide workers with an accessible supply of clean, non-polluted water for drinking, washing and for other domestic purposes. Water supplies may be inspected by a Health Officer. o Article 68: requires the employer to make sufficient and proper sanitary arrangements for workers. o Article 69: requires the employer to provide accommodation for the worker and his family if they are not conveniently located to the work place. o Article 70: requires the employer to provide medical care at the workplace. o Article 71: states that depending on the circumstances the employer may be required to provide medical facilities,
The Safety at Work (Pesticide Regulations)	1983	This regulation is included as a component within the Safety at Work Act and deals with the following: o Article 3: requires the formation of a Pesticides Registration Advisory Committee. o Article 4: Requires a Register of Pesticides to be maintained. o Article 13: shows that all pesticide containers are to be labelled with the following: a. The trade name of the pesticide. b. The net weight and ISO approved name of the active ingredient, together with its formulation. c. Directions for use and what the pesticide is to be used for. d. Hazard label regarding storage, and handling and safety equipment required for application. e. Minimum withholding periods prior to harvest. f. First aid treatment.

		g. Name of manufacturer and registration number of the pesticide. o Article 15: shows that no unlabelled pesticides can be imported, while Article 16 states that pesticides cannot be sold, supplied or used other than in the original container. o The First Schedule classifies pesticides into 4 hazard levels depending on their oral or dermal toxicity as follows: 1a - extremely hazardous; 1b - highly hazardous; II - moderately hazardous; and III - slightly hazardous.

Annex 3: Monitoring Checklist (pre-construction and construction)

	Subproject activities	Applies	Mitigation approaches	Monitoring Responsibility	Parameter to monitored	Means of verification and frequency	Achieved (yes, no)	Remarks/ Action
PRE-CONSTRUCTION PHASE	UXO Survey	• Contactor	• Completion of the UXO survey by qualified personnel.	• SP,	• The survey has been carried out by approved personals	• Certificate showing the subproject area is UXO free	•	•
	Development of preliminary designs /site plans / maps	• Contractor	• The concept drawings and route are designed to avoid resettlement impacts and disturbance to vegetation.	• SP.	• Plans approved by HCC and the town country planning board	• Building permit	•	•
CONSTRUCTION PHASE	Vegetation clearance	• Contractor	• Minimize clearance to the construction perimeter; • Unnecessary clearance avoided. • Compensation based on MAL rates.	• SP, Contractor	• Area of vegetation; area of felled trees/vegetation removal.	• During survey and activities - visual inspection before, during and after	•	•
	Operation of construction machinery generating emissions	Contractor	• Maintain construction equipment; • Prohibit the use of equipment that causes excessive pollution (e.g. generates smoke).	SP, Contractor	• Air quality, emissions.	• Weekly or after complaint - periodic visual inspection; • Any particulate matter and smoke		
		Contractor	• Thorough watering to avoid dust	SP, Contractor	• dust, particulate matter; • Use of tarpaulins and loading of vehicles; • Stockpiles.	• Weekly or after complaint - periodic visual inspection	•	•

	Subproject activities	Applies	Mitigation approaches	Monitoring Responsibility	Parameter to monitored	Means of verification and frequency	Achieved (yes, no)	Remarks/ Action
	Operation of construction machinery creating noise	Contractor	• Construction machine exhaust systems and noisy equipment will be maintained to minimise noise. (See WB noise guideline in Table 4). • Limit noisy construction activities to day time hours, i.e. construction activities prohibited between 5pm and 6am • Agree works schedule with stakeholders	SP, Contractor	• Adherence to agreed schedule; • Complaints (no. logged with resolution).	• Weekly or after complaint - review schedule • Consultation (ensure schedule being adhered to)	•	•
		Contractor	• Workers limit of exposure to noise will be strictly below 85 decibels per 8-hour shift • Provide workers with noise abatement equipment (ear-muffs etc.) • Complaints will be addressed by the contractor	SP, Contractor	• Workers safety equipment.	• Weekly • Workers are provided with safety equipment	•	•
	Stockpile of Construction Materials	Contractor	• Construction materials will be stockpiled away from the drain and covered when necessary. • Placement of diversion ditches around stockpiles	SP, Contractor	• No stockpiling close to water bodies.	• Weekly-Visual Inspection	•	•
		Contractor	• Material stockpiles located in sheltered areas and to be covered	SP, Contractor	• dust, particulate matter; • Stockpile covered.	• Weekly or after complaint - periodic visual inspection	•	•

	Subproject activities	Applies	Mitigation approaches	Monitoring Responsibility	Parameter to monitored	Means of verification and frequency	Achieved (yes, no)	Remarks/ Action
	Clearing, excavations and installation of solar	Contractor	• Standard Operating procedures (SOP) for instalment correctly executed. • Workers wear protective equipment including clothing, helmets, safety boots, earmuff acts	SP, Contractor	• Workers wore safety equipment.	• Workers are provided with safety equipment • Daily inspection	•	•
		Contractor	• The area surrounding the instalment site bund and secure. • Spills clean as per emergency response plan	SP, Contractor	• emergency response plan; • Spills cleaned and the area rehabilitated; • Workers are provided with safety equipment.	• Weekly inspection	•	•
		Contractor	• Should UXO be discovered, the contractor is to immediately cordon off the area arrange the evacuation of nearby residences and inform the RSIPF of the find.	SP, Contractor,	• The occurrence of UXO at the construction site	• Upon discovery of UXO	•	•
		Contractor	• Keep roadside vegetation • Use of silt control devices and sediment traps/fences when required • Construction of sediment settling ponds and bunds. Diverting turbid water to sediment settling ponds.	SP, Contractor	• Reduced soil erosion and sedimentation • Vegetation clearance minimized • No dump sites near waterways	• Weekly - visual inspection	•	•

	Subproject activities	Applies	Mitigation approaches	Monitoring Responsibility	Parameter to monitored	Means of verification and frequency	Achieved (yes, no)	Remarks/ Action
		Contractor	• Ensure that all construction machines are well maintained. • A prestart on construction machine carried out every morning • Oil/fuel remediation agents, oil pads, oil booms and geo-fabric clothes are procured for usage as part of the emergency response plan	SP, Contractor	• Construction machinery maintain in good working order • Spot check for visible oil • Water quality	• Weekly - visual inspection	•	•
		Contractor	• Development footprint will be provided with effective drainage systems which will avoid direct discharge to creeks or streams (when the need arises)	SP, Contractor	• No direct discharge to water bodies	• Weekly - visual inspection • SP, ECD	•	•
		Contractor	• Contractor to allow sections of the road area to be continuously accessed by the affected party and guided through to avoid any safety problems. • Signs and other appropriate safety features will be used to indicate construction works are being undertaken. • Contractor to develop Traffic Management Plan as part of CESMP.	SP ,Contractor	• Maintenance of access; • Signage; • Road free of materials and debris;	• During activities - Visual inspection; • Consultations; • Review of the traffic management plan	•	•

	Subproject activities	Applies	Mitigation approaches	Monitoring Responsibility	Parameter to monitored	Means of verification and frequency	Achieved (yes, no)	Remarks/ Action
	Fuelling construction machines and storage of Hydrocarbons	Contractor	• Detailed Emergency Response Plan (as part of CESMP) prepared by the contractor to cover hazardous materials/oil storage, spills and accidents. • Chemicals will be stored in secure containers away from the water birdies. • Chemicals stored in area or compound with concrete floor and weatherproof roof and fire extinguishers. • Ensure that all construction machines are well maintained. • Accidents reported to police within 24 hours.	SP, Contractor	• Ensure storage sites are using existing concrete base;	• Weekly inspection	•	•
		Contractor	• Prohibit smoking close to fuel storage areas • Put up signs of no go smoking zones • Provide extinguishers and train workers on their use	SP, Contractor	• Signs and fire extinguishes	• Code of conduct and housekeeping rules being adhered to. • Verify records of accidents	•	•
		Contractor	• Store kerosene, diesel, petrol and lubricants in a bunded area with an impervious surface and with stormwater drainage provisions as approved by the Engineer.	Contractor	• Handling of hazardous materials.	• Weekly inspection	•	•

	Subproject activities	Applies	Mitigation approaches	Monitoring Responsibility	Parameter to monitored	Means of verification and frequency	Achieved (yes, no)	Remarks/ Action
			• Store paint and chemicals in a hazardous materials storage shed with walls, roof, ventilation and a bunded floor with an impervious surface; • Ensure that the storage capacity of each bunded area is at least 105% of the total volume of hazardous material stored; • Secure the areas and sheds used to store hazardous materials by erecting a security fence of minimum height 1.80m around each facility with the fence located outside the bund; • Locate the hazardous materials storage areas at least 10.0m away from any watercourse; • Contain and mop up spills of hazardous materials in accordance with manufacturer's specifications					

	Subproject activities	Applies	Mitigation approaches	Monitoring Responsibility	Parameter to monitored	Means of verification and frequency	Achieved (yes, no)	Remarks/ Action
	Presence of construction workers	Contractor	• Garbage receptacles will be set up at construction sites, which will be regularly cleared by the contractor. • Contactor to prepare a waste management plan (as part of CESMP). • All wastes from worksites to be disposed of in approved landfill/areas by RPG and SP. • The contractor will provide sufficient training in appropriate waste disposal methods.	SP, Contractor	• Waste management - visual inspection that solid waste is disposed of as per CESMP;	• Monthly, as required and spot checks - visual inspection; • Review of the waste management plan	•	•
			• No wastes to be dumped in waterways. • The contractor ensures wastes not discharged to rivers or coastal waters and that all wastes disposed of in proper areas. • Contractor to provide adequate and safe drinking water.	SP Contractor	• No direct discharges to local streams, coast or rivers; • The regularity of waste removal	• Visual inspection Weekly	•	•
		Contractor	• Facilitate reconciliation between parties- affected person, contractor to involve in resolving the issue. • Call the Police once it goes beyond control.	Contractor	• No. concerns raised and resolution; •	• Ongoing - consult with the public to monitor environmental concerns	•	•

Annex 4: General Work Permit

APPENDIX 1: GENERAL WORK PERMIT

CONTRACTOR GENERAL WORK PERMIT			
PROJECT NO.		PERMIT NO.	

(A) WORK TO BE UNDERTAKEN

(B) PERMIT DETAILS	
Location	
Permit Duration	
Start Date/Time	
End Date/Time	
THIS PERMIT IS ONLY VALID FOR THE TIME SPECIFIED	
(C) NAMES OF PERSONS SUPERVISING WORK	
Responsible Person	
Standby Person	
Note: It is the responsibility of the Responsible person to ensure that the personnel involved in carrying out the work fully understand the detail and requirements of work under this permit.	

(F) NAMES OF PERSONS INVOLVED			
EMPLOYEE NAME	SIEA INDUCTED	SITE INDUCTED	COMMENT
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
Note: Complete extra names on another sheet of paper where required using above format and attach to this permit.			

(D) STATEMENT BY RESPONSIBLE PERSON		
I hereby acknowledge receipt of this permit and state that I fully understand my duties. I am aware of the nature and position of the work area and plant covered by this permit. I am satisfied that I and the persons under my control to work under this permit should have no difficulty in keeping clear of unsafe plant in the course of the work.		
SIGNATURE	DATE	TIME

(E) SIEA ISSUING AUTHORITY			
TITLE	SIGNATURE	DATE	TIME
Property Manager			
Chief Engineer			

(G) PRECAUTION AND PROTECTION		
REQUIREMENTS	REQUIRED	N/A
Full time supervision		
Standby Person		
Safety Harness		
Head Protection		
Eye Protection		
Ear Protection		
Hand Protection		
Feet Protection		
Body Protection		
Reflector Vests		
Persons entering the worksite have been instructed to take all of the above precautions.		
COMMENTS:		

(H) REFERENCES:	
1. Work Methodology	
2. Check Sheets	
3. Drawings	
4. JSA	
5.	
6.	

(I) CANCELLATION OF PERMIT BY RESPONSIBLE PERSON		
The work under this permit is now complete and the work area has been vacated.		
SIGNATURE	DATE	TIME

Document No:OHSC34 Version 1	*Custodian: OHS Officer*	
Created: February 2016	*Last Review: November 2018*	*Next Review: December 2019*

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SIEA UXO Clearance Framework and Guide

November 2014
Revised June 2019

12.0 Table of Contents

Acronyms

AOD	Abandoned Ordnance
CWPM	Capital Works Programme Manager
EOD	Explosive Ordnance Disposal
MID	Ministry of Infrastructure and Development
OH&S	Occupational Health and Safety
RSIPF	Royal Solomon Islands Police Force
RSIPF-EOU	Royal Solomon Islands Police Force – Explosive Ordnance Unit
SIEA	Solomon Islands Electricity Authority **(Authority)**
SIG	Solomon Islands Government
UXO	Unexploded Ordnance
WWII	World War 2

1.0 Introduction

Solomon Islands was the site of severe battle between the Japanese Army and the American Allied Forces during WWII. The war resulted in hundreds of thousands of firearms and UXO items left behind.

WWII ordnance found in Solomon Islands can be defined as either unexploded (UXO) or abandoned (AXO). Unexploded ordnance are explosive ordnances that has been primed, fused, armed or prepared for use in armed conflict but has failed to explode. Abandoned explosive ordnances are explosive ordnance unused during the war and subsequently left behind.

For the purpose of this guide, UXO is used as the general term to describe unexploded or abandoned ordnance, munitions and explosive devices left behind during WWII which represents a hazard to people and to any future development of the land on which they are abandoned.

Although UXO is not captured in the Environmental Act 1998 and Environmental Regulation 2008, UXO clearance activities have become an integral part in any development activity in the Solomon Islands. As the ministry responsible for infrastructure development in SI, MID has a draft UXO procedure developed as a means to render safe and take responsibility for UXO related hazards on any development activity occurring on SIG crown land.

Note that this guide only provides guidance for the management of UXO threats. It does not give detailed guidance on EOD contracting practise. The safety of SIEA employees, its clients and customers, developers and partners, consultants and contractors are not guaranteed.

More guidance on international standards on unexploded ordnance for the construction industry can be obtained from **CIRIA C681: Unexploded Ordnance (UXO)**

2.0 Objective of the Guide

The overall purpose of this guide is to provide a policy and framework governing responsibility and procedures to assess, mitigate and eliminate any UXO related hazard from any SIEA project site before any construction work commences. It provides guidance on the management of any UXO hazards associated with any development activity carried out by the Authority.

This guide also helps the Authority conduct appropriate UXO risk management procedures at the design phase, provide budget for and seek appropriate advice and guidance on UXO contamination and disposal.

It provides the steps to follow to allow EOD contractors to sweep and clear contaminated project sites before any building, engineering, geotechnical investigations, and maintenance work of a construction nature starts.

3.0 Target Audience

This guide is targeted for SIEA staff, its clients and customers, developers and partners, consultants and contractors. It should be applicable to health authorities, the environmental

division, land owners and other relevant local agencies and stakeholders involved in the development project.

SIEA Contractors and Engineers are equally responsible for the wellbeing of their personnel on site and would be advised at the initial contract meetings of their responsibility, the process to manage UXO risks and who to contact at SIEA regarding UXO sightings and threats during project construction.

4.0 Responsibility and Risk Mitigation Measures

Risk mitigation measures are put in place to ensure so far as is reasonably practical the health and safety of SIEA employees and of any other persons affected by the development activity.

4.1 Authority

SIEA and all its employees have a responsibility under the SIEA OH&S policy[19] to ensure the safety of its staff and every other person involved or affected by its normal day to day operation or any development activity.

The responsibility to report a sighting of a UXO or any suspicious article found at project sites or any SIEA location in the country resides with the SIEA and all its employees.

In the event of a suspicious UXO find, the following risk mitigation measures should immediately be followed.

- the area must be cordoned off appropriately
- physical measures put in place to avoid unauthorised tampering of the UXO find
- highly visible markings are provided at the HIGH RISK area.
- the UXO risk is communicated to surrounding communities

The find is reported to the SIEA Capital Works Programme Manager (CWPM) and the RSIPF-EOU. The CWPM will be responsible for the assessment, mitigation or elimination of any UXO related hazard with responsible authorities and EOD clearance contractors. SIEA will keep statistics and records of UXO information from studies done on its sites and the report made available to public upon request.

A reporting system is required to be established, communicated to all parties and managed for UXO clearance activities.

SIEA is responsible for public awareness and consultation and building employee and stakeholder capacity to respond to the UXO threats at SIEA locations

UXO clearance will be considered and integrated into capital development activities and budget.

4.2 General Public

[19] The SIEA policy on Occupational Health and Safety 2010 is being reviewed.

The general public must be consulted and encouraged to provide feedback and comments on their general short and long term safety during planning and design stage through the operational life of the project. These public consultations are carried out as part of required activities at the initial project initiation, planning and design stage.

Public comments and concerns must be properly documented and timely feedback provided. The mechanism to address public concerns will follow the existing SIEA mechanism for handling of customer complaints, through the Customer Service Department and the Public Relations Officer.

4.3 EOD Contractors

EOD contractors are required to be competent and registered to carry out this type of service. They are required to have the necessary expertise and equipment to identify, isolate, remove and safely dispose all UXO threats with assistance from the RSIPF-EOU.

The EOD contractor is responsible for site safety procedures and are required to have in place appropriate strategies to manage risks and environmental impacts and have appropriate insurance coverage.

The contractor will provide to SIEA before any clearance work begins,

- Supporting documentation on competency (experience and references), insurance coverage and legal registration where necessary
- Proposed suitably qualified and experienced staffing to carry out the service
- Proposed procedures complying with international standard UXO clearance practices
- Proposed UXO identification and clearance methodology and timing
- Contract amount for the service

The typical activities to be carried out by EOD contractors is summarised below.[20]

- Carry out and complete UXO survey of the project site including affected areas outside of the project site but related to the project.
- Cordon off areas and prevent unauthorised tampering where suspected UXO threats are determined.
- Arrange for and carry out safe removal of all UXO ordnance from project site.
- Responsibly dispose UXO ordnance in accordance with relevant local law
- Ensure strategies and resources are in place to manage unintended accidents and explosions.
- Provide a report confirming completion of UXO survey, detection, removal and disposal.
- Provide necessary documentation to RSIPF – EOD and other relevant SIG agencies for the issuing of a Certificate of Clearance.

[20] The procedures are summarised from the MID's '9.0 Unexploded Ordnance Procedure'

- Continuously monitor, document and report to SIEA and RSIPF any residual UXO threats arising during project implementation

The contractor will confirm and certify in accordance with **CIRIA C681: Unexploded Ordnance (UXO**) or an alternate internationally accepted standard.

4.4 RSIPF – EOU

The RSIPF– EOU is the body responsible for clearance and disposal of UXO finds. The RSIPF EOU also responds to public reports of UXO and undertake clearance activities. Where there are no nearby police stations in the outer islands, reports should be directed to relevant government district agencies which then notify police at the provincial headquarters.

The RSIPF EOU will provide a Certificate of Clearance after suspected UXO ordnances have been removed by them or by EOD clearance contractors before any construction work can begin.

5.0 Risk Assessment and Management

5.1 Preliminary Risk Assessment

Preliminary risk assessment is required to be carried out to enable SIEA to identify any potential UXO risk or threat and decide whether a detailed risk assessment is required.

Preliminary risk assessment includes:

- examination of existing historical data
- talking with local surrounding communities about any past occurrences with UXO's
- provide probability on threat potential and
- recommend further steps to take

This is to be documented and filed and communicated to the CWPM or Project Engineer. A Preliminary risk assessment form is attached in Annex 1.

If potential risks are identified, a detailed risk assessment leading to detection and identification, recovery and disposal will be initiated.

5.2 Detailed Risk Assessment

In the Detailed Risk Assessment stage, project planning will take into consideration UXO activities in the design and budget for the project.

Risk mitigation measures are put in place and the public made aware of the UXO risk.

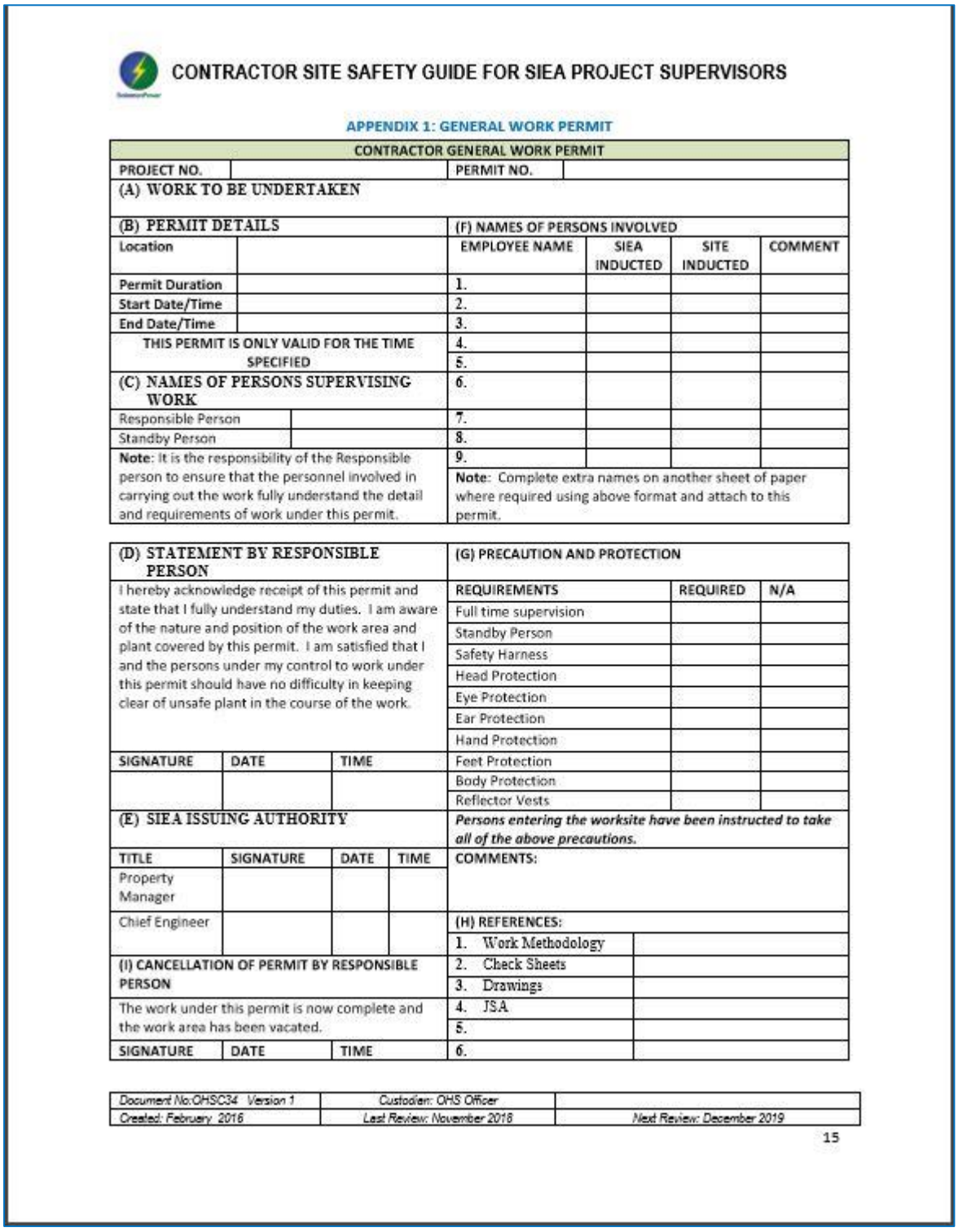
6.0 Contact Details

All SIEA staff, clients and customers, developers and partners, consultants and contractors are to contact the following SIEA and RSIPF personnel regarding UXO issues on SIEA land.

Organisation	**Contact Detail**
Royal Solomon Islands Police Force (RSIPF)	Director Explosive Ordnance Unit P.O. Box G1723 Honiara

	Tel: 23820
Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM).	Director –Tel:24070 Environmental Conservation Division P.O. Box 21 Honiara Tel: 23031/28054 Undersecretary technical
Ministry of Infrastructure (MID)	Under Secretary (Technical) P.O. Box G8 Honiara Tel: 24247-Undersecretary Admin Tel: 20331-Undersecretary Technical

Annex 6: Contractor General Work Permit



CONTRACTOR SITE SAFETY GUIDE FOR SIEA PROJECT SUPERVISORS

APPENDIX 1: GENERAL WORK PERMIT

CONTRACTOR GENERAL WORK PERMIT			
PROJECT NO.		PERMIT NO.	

(A) WORK TO BE UNDERTAKEN

(B) PERMIT DETAILS

Location	
Permit Duration	
Start Date/Time	
End Date/Time	

THIS PERMIT IS ONLY VALID FOR THE TIME SPECIFIED

(C) NAMES OF PERSONS SUPERVISING WORK

Responsible Person	
Standby Person	

Note: It is the responsibility of the Responsible person to ensure that the personnel involved in carrying out the work fully understand the detail and requirements of work under this permit.

(F) NAMES OF PERSONS INVOLVED

	EMPLOYEE NAME	SIEA INDUCTED	SITE INDUCTED	COMMENT
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				

Note: Complete extra names on another sheet of paper where required using above format and attach to this permit.

(D) STATEMENT BY RESPONSIBLE PERSON

I hereby acknowledge receipt of this permit and state that I fully understand my duties. I am aware of the nature and position of the work area and plant covered by this permit. I am satisfied that I and the persons under my control to work under this permit should have no difficulty in keeping clear of unsafe plant in the course of the work.

SIGNATURE	DATE	TIME

(E) SIEA ISSUING AUTHORITY

TITLE	SIGNATURE	DATE	TIME
Property Manager			
Chief Engineer			

(I) CANCELLATION OF PERMIT BY RESPONSIBLE PERSON

The work under this permit is now complete and the work area has been vacated.

SIGNATURE	DATE	TIME

(G) PRECAUTION AND PROTECTION

REQUIREMENTS	REQUIRED	N/A
Full time supervision		
Standby Person		
Safety Harness		
Head Protection		
Eye Protection		
Ear Protection		
Hand Protection		
Feet Protection		
Body Protection		
Reflector Vests		

Persons entering the worksite have been instructed to take all of the above precautions.

COMMENTS:

(H) REFERENCES:

1. Work Methodology	
2. Check Sheets	
3. Drawings	
4. JSA	
5.	
6.	

Document No:OHSC34 Version 1	*Custodian: OHS Officer*	
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Annex 7: Dala Consultation Report

Dala Solar Hybrid Subproject
Consultation and Awareness Report
June 2020

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List of Tables

1.0 Background

1.1 Introduction

The Dala Solar Hybrid is a subproject under component 1 of the SIEAREEP. Dala is located in Central Malaita, Malaita Province. It is approximately one hour by truck from Auki, the provincial capital. Construction activities for the solar hybrid will be restricted to creating a driveway onto the site, removal of vegetation from the site, installing foundations for the solar arrays, erection of a secure building to house storage batteries, a diesel generator for generation backup and other ancillary equipment, installing the solar arrays and controllers, and installing of security fencing. Construction of the distribution grid will involve excavating holes for placement of power poles alongside existing roads and tracks, erecting the poles, stringing the power wires, and establishing the electrical connections to existing buildings. Based on the high-level concept design, the system will be comprised of battery storage of 263kWh and a 53kW backup diesel generator.

The consultation and social survey team comprise of seven SP officers: Simon N (Lands Officer), Winston Lapo (Safeguards specialist), Angeline Pandinao (Environment Officer), Javelyn Gani (Gender officer), Josiah Rade (Planning Engineer) and Gaby Galo (Safety Officer). The agenda of the meetings including the following:

1) Subproject Background and Scope of Work;
2) Land Easement and Memorandum of Understanding for the network;
3) Environment and Social Impacts and Mitigations;
4) Occupational Health and Safety; and
5) Purpose of the social survey.

2.0 Consultations

The consultations were conducted in four main communities between Dala and Fauabu.

2.1 Schedule

Table 1: Schedule of Activities

Date	Community	Activity
Saturday 13th June 2020	Dala North	• Consultation meetings, • MOU Signing.
Saturday 13th June 2020	Dala South	• Consultation meetings, • MOU Signing.
Sunday 14th June 2020	-Dala North -	• Household Survey
Sunday 14th June 2020	Dala South	• Household Survey
Sunday 14th June 2020	Kakara	• Community Consultations, • MOU Signing.
Sunday 14th June 2020	Takaodo	• Community Consultations, • MOU Signing.
Monday 15th June 2020	Takaodo &	• Household Survey
Monday 15th June 2020	Kakara,	• Household Survey
Monday 15th June 2020	Aota	• Household Survey

2.2 Questions and Answers

Table 2: Questions raised and responses

Communities	Questions	Responses
Dala North Community	Public Safety. Is it safe for the public?	Safety signs will be placed on site during construction. The SP OHS team will provide safety trainings prior to construction on the use of electricity, management of electricity, what to do during incidents and who should we call during incidents. It is important to respect SP assets.
	Is it possible to connect electricity to a leaf houses?	Yes, it is possible on the condition that it meets the specification standards and does not leak or be able to withstand extreme weather events.
	Is the power free or some charges imposed for landowners?	Tariff is the same for both urban and rural areas. SP is a state owned enterprise (SOE) and it operates under the electricity act. SP must make income in order to sustain its operation and expand the network to other rural communities in the country.
	Does our land or trees compensated if SP uses that piece of land for its poles or cut a tree down during clearance?	SP does not acquire the location of poles and network corridors. SP will sign a Memorandum of Understanding (MOU) for easement of the network. Crop compensated will be based on MAL rates.
	Can SP install streetlights?	The scope of the subproject does not include streetlights at this stage.
	Nearest cash power office.	Auki is the nearest cash power office. There will be a SP office in Dala station to provide the cash power service.
Dala South Community	What tools should I use to get someone out if he/she is subjected to electric shock?	It is important to maintain distance from the scene and call the nearest SP office for assistance. Use nonmetal object only when it is safe and is it appropriate for the situation.
	How do SP deal with development on customary lands?	SP acquire sites for SP development according to the Solomon Islands Lands and Tittle Act. SP network will pass through customary lands.
Takaodo Community	Are there provisions to lower the tariff (rate) for rural communities?	Tariff is the same for both urban and rural areas. SP is a state owned enterprise (SOE) and it operates under the electricity act. SP must make income in order to sustain its operation and expand the network to other rural communities in the country.
Kakara Community	If SP Solar hybrid is operational, can we still use our mini-solar panels for light?	Yes. The power will be available but you can still use the mini-panels.
	Is it safe for our children and community?	SP will ensure the solar hybrid and network met the safety standards. The SP OHS team will provide safety trainings prior to construction on the use of electricity, management of electricity, what to do during incidents and who should we call during incidents. It is important to respect SP assets.

Appendix

Appendix 1: Consultation Photos

Dala North Community

Dala South Community

Kakara Community

Appendix 2: Participation List

Dala North Attendance List

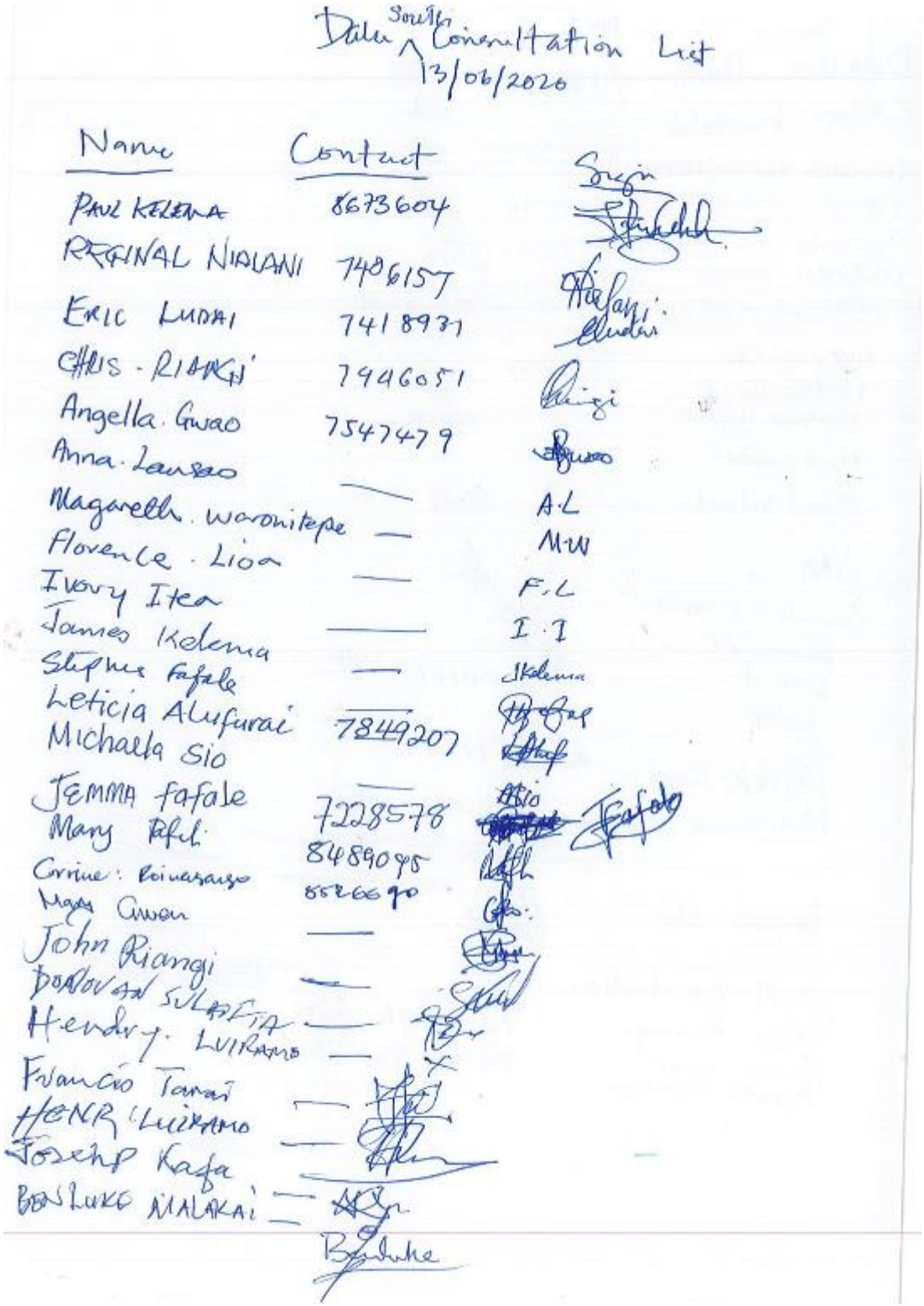
Dala consultation List
13/06/2020

Name	Contacts	Sign
1. Allen Toron	7942135	
Hendrick Aremo		
John Mark Ramo		
Andrew Ramo.		
Philip Korade.		
Fred Aremo.		
Samson Fefele		
Michael Salai		
Wilson Salang		
Manasseh Kodere		
Thomas Talagu		
Abel Subia		
Simon Orobulu.		
Hubert Silireba		
Jack Kaia		
Baddley Tabusi		
Edwin Tasiasi		
Edwin Orobulu.		
Manoli Blake		
Wilson Ngao.		
Ray Dolaiasi		
John Mark Sitian.		
Fr. Edwin Ato.		
Stephen Orobulu.		
Michael Salang.		
Wilson Salang.		
Philip Maenua.		
Peter Maenua.		
Babra. Orobulu.		

Wilson Mae.
Fr. Emmanuel Sira.
Dorah. Palmer.
Isaach Bilmae
Andrew Belo.
Siuna Aremao.
Brenda Maeaua.
Mathias Busale.
Mary Anna.
Palson Afuga.
Joshua. Maegalo.
George Dere.
Gorden fafale.
Emily Rame.
Rose Jude
Fredrick Tuasulia
John. Tuasulia.
Dickson Malefo.
Patson Afuga
Andrew Sale.
Fr. Gabriel fari.
Fr. Allan. Liomaure.

Hellen Norman.
Thomas Kelaiau
Mahaliah Kooteere.
Justin Nwaidili.
Paul Sunga.
Charles Norman
Robert fafale.
Selina Maefo.
Joe Kaboto.
Harbert Keteau.
Cecilia Belo.
Andrew fafi.

Dala South Attendance List



Dala South Consultation List
13/06/2020

Name	Contact	Sign
PAUL KELENA	8673604	
REGINAL NIALANI	7486157	
ERIC LUDAI	7418937	
CHRIS - RIANGI	7446051	
Angella. Gwao	7547479	
Anna. Lausao	—	A.L
Magarella. Waronitepe	—	M.W
Florence. Lioa	—	F.L
Ivory Itea	—	I.I
James Ikelema	—	Ikelema
Stephen Fafale	—	
Leticia Alufurai	7849207	
Michaela Sio	—	Sio
JEMMA fafale	7228578	Fafale
Mary Rfl.	8489095	
Corrine: Poinarasuo	8526690	
Maya Gwao	—	
John Riangi	—	
Donovan SULUFIA	—	
Hendry. LUIRAMO	—	
Francis Tarai	—	
HENRY LUIRAMO	—	
Joseph Kafa	—	
BENLUKE MALAKAI	—	Benluke

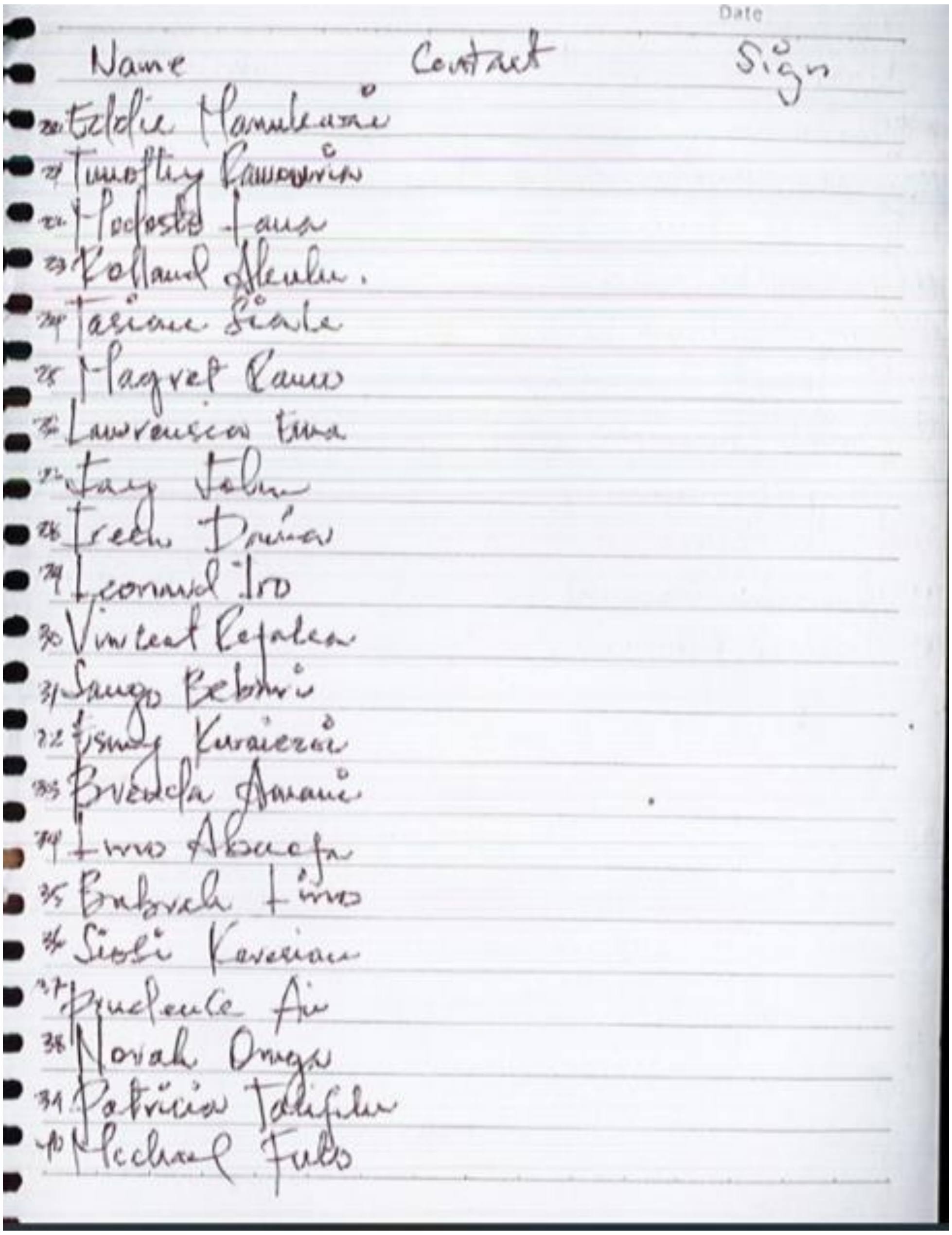
Name	phone	Sign
DOMINIC TARAI	7183013	[signature]
Casper Fa'asala		[signature]
Evaristo Gwaulibora	8537063	[signature]
Patrick-pifau	8501046	[signature]
THOMAS AUMAOMA	8678101	[signature]
GRAHAM FAFALE	8555373	[signature]
Ephraim Kaleui	—	[signature]
MARY J. SAU	7792214	[signature]
Philothea Sau		[signature]
Angilena guguta		[signature]
Mary Guguta		
Alfred Kotaau	—	[signature]
KOA	—	[signature]
JOACHIM RIANGI	—	[signature]
Daniel	—	[signature]
David	8416663	[signature]
same	—	[signature]
Patrick Tarai	8517238	
Mauricia Hellen	7408026	[signature]
Bryan Oli		[signature]
Chris Fanabalao.		
Chris Riangi	7520676	[signature]
Junior Moses	8429086	[signature]
MICHAEL OTOTAIAU		

Takaodo Attendance List

No.
Date 14/06/2020

Takaodo Community Consultation

Name	Contact	Sign
1. Saily Camoni	78925616	[signature]
2. Selestino Naunkani		
3. Leonard Fuga		
4. Daniel Damia		
5. Rolland Romeo		
6. Patrick Salwi		
7. Severino Tatta		
8. Francis Kairon		
9. Augustine Tuega		
10. Aloysius Fuga		
11. Emiliano Ntuite		
12. Gasper Tecta		
13. Rex Romeo.		
14. Casper Tauraua		
15. Emmanuel Alisle		
16. Simon Au		
17. John Egeta		
18. Michael Fafale		
19. Leonard Tielanga		



Date

Name	Contact	Sign
20 Eddie Hamuleauai		
21 Timothy Lauaupin		
22 Modesto Laua		
23 Rolland Aleuler.		
24 Tasiane Siale		
25 Magret Rauw		
26 Lawrensio Tiva		
27 Fay John		
28 Frech Drua		
29 Leonard Iro		
30 Vincent Rejalea		
31 Sango Bebmi		
32 Fisnay Kuraierui		
33 Brenda Awanui		
34 Linno Abuefa		
35 Gabriel Liwo		
36 Sioli Kerrian		
37 Prudence Air		
38 Norah Omega		
39 Patricia Talifiler		
40 Michael Fulo		

No.

Date

Name	Contact	Signature
41 Brenda Saligo		
42 Sevah Gogofi		
43 Franciana Fiiga		
44 Cesilia Tefalia		
45 George Matua (Jr)		
46 Rafmoneel Isua (Jr)		
47 David Uualeon.		
48 Sauly Gaguuae.		
49 Darin Rome		
50 Augustina Maufuaz.		
51 Kuanni Lomo.		

Annex 8: Dala Network MOU

MEMORANDUM OF UNDERSTANDING

SP-MOU-17: Easement for Power Line Construction

THIS MEMORANDUM OF UNDERSTANDING is made on the ....12nd..... **Day of the month of** .....June..... **Year Two Thousand and Twenty (2020)**

BETWEEN the Solomon Islands Electricity Authority (SIEA) **trading as Solomon Power** (hereinafter referred to as **"SP"**) as one part;

AND: The Land Owning Groups of Dala community (North & South Dala) and Zone representatives of, Tack Wind, Tofafo, Kakara, Texas, Durukao, Takaodo, A'ato, Fau'abu, Tiuni, Anomose, Falake, Tafirodo, Apollo, Ruaniu and Geloa, West Kwara'ae, Malaita Province, (hereinafter referred to and "the Landowners") on the other part

The landowners are here representing the approval of clauses of this MOU in relation to the entire distribution line coverage and route as shown in the attached map.

WHEREAS:

A. Solomon Power is desirous of constructing its network which includes:

- ☐ Building of High Voltage (HV) power lines and poles
- ☐ Building of Low Voltage (LV) power lines and poles
- ☐ Installing of Distribution Transformer and/or Ring Main Units

B. Solomon Power has the right to construct power poles, transformer, and other related infrastructure along the public and feeder roads within the concerned area. As part of its community consultation process, it had been engaging in a series of meetings with respective community leaders to obtain the approval and support for the project.

C. The Chiefs, Community leaders/Elders and Landowners along the access road, which the line will run, have an overwhelming support for the project to proceed.

D. The Chiefs, Community Leaders/Elders and Landowners are desirous of having power to their communities and pledged to support the project.

E. The parties to this MOU are desirous of making their commitments to the construction of the power lines in Dala community under this MOU.

1.0 Solomon Power AGREED AS FOLLOWS:

1.1 To commence construction of the lines in and around Dala community as soon as this MOU is signed by relevant parties.

1.2 To provide all the materials and technical staff for the purpose of constructing the power lines.

1.3 To ensure that safety of the community and the general public is maintained by placing appropriate sign boards and demarcations where constructions will be carried out throughout the duration of the project.

1.4 To ensure the built infrastructure is maintained such that vegetation is properly controlled and faulty lines, poles and transformer is repaired and addressed to Solomon Power Standards.

1.5 To carry out assessments and costing of either HV or LV extensions from the main line to connect individual homes/village/commercial undertakings on request. The cost of such extension will be subject for discussions between the interested parties and Solomon Power.

1.6 To compensate for any *cultured vegetation*[1] along the route of the easement required for construction purposes. The rate(s) will be according to standard agriculture rates as stipulated in "The Forest Resources and Timer Regulations".

[1] Cultural vegetation is planted and/or maintained by humans

2.0 LANDOWNERS AGREED AS FOLLOWS:

2.1 To pledge their support for the project to proceed by allowing Solomon Power to construct equipment as stated in Part A) along existing and new easements.

2.2 To inform members of their respective communities to support the project in order for its implementation to progress smoothly without interference.

2.3 To meet the cost (or to seek other assistances) of the service lines to individual homes/villages/community buildings/commercial buildings etc. where necessary.

IN WITNESS WHEREOF the PARTIES hereto have agreed on the afore-stated terms

and **SIGN** this **MEMORANDUM OF UNDERSTANDING** with their **SEALS**

affixed on this ..... 22nd ..... **day of the month of** .... June ..... **Year**

Two thousand and twenty (2020).

Signatory forming the agreement as per this MOU on behalf of Solomon Power:

Name: Martin Sam

Position: CEO(AG)

Signature: 

Date: 22/06/20

Signatories forming the agreement as per this MOU on behalf of the Land Owners:

Name of Person(s)	Position Relevant to the project	Signature	Date
Sarey Ramosi	Community Leader		14/6/20
Selestino Nuvulewai	Community Leader		14/6/20
Bonnee Bania	Catechist		14/6/20
Rolland Ramo	Sunday School Leader		14/6/20
Daniel Buarafi	Chiefs Paramount		14/6/20
Samuel Nuala	C/Chief		14/6/20
Rev Josiah E. Lamani	A.O.G Church Pastor		14/6/20
Pr. James Iven	Pastor S.C.E.C		14/6/20
Casley Ratu	Chief		15/6/20

Dala North.

Andrew Billy	Land Trustee		13/6/20
Allan Tomo	Community Representative		13/6/20
Hendriac Aremao	Head Teacher Dala		13/06/20
Chanel Ruba	Chief.		13/06/2020
Fr Emmanuel Sua	Priest		13/06/2020
Fr. Edward Ato	Prest.		13/06/20
Simon Orobuli	Teacher		13/06/20
Manuel Blake.	Youth.		13/6/20
Mathias Bosola	Mission Secretary		13/6/20
Fr Allen Liamauri	~~Land Trustee~~ Parish Priest.		13/6/2020
Henry Oraelly	Youth Leader.		13/6/20

Anthony Kolama	Chief.		13/6/20

ERIC LUDAI	TEACHER		13/06/20
Paul Kelema	farmer		13/06/20
CHRIS Ruzi	chief		13/06/20
ALLEN TONY	TEACHER		" " "
Fred Kadiko	farmer		" "
EDWARD JOHN FLIAY	FARMER		✓
REGINAL NALANI	FARMER		✓
MARY TAFIA	H/Teacher		✓
JAMES TARAI	FARMER		✓

Angella Guao	Foresting Ranger Officer	[signature]	13/6/20
Anna Lausaro	Farmer	[signature]	13/6/20
Ranny Rolaio	Teacher	[signature]	13-6-20
PETER SUDA	Student	[signature]	13-6-20
Mary Guven	Student	[signature]	✓
Corrine: Roinasango	student.	[signature]	13/06/20.
Fred Duoi	Catachist	[signature]	13/06/20.
Dickenson Ramositia	Chief	[signature]	13/06/20.
Andrew Sale.	Chief	[signature]	13/06/20
Fr. Gebriel Fari	Priest	[signature]	13/06/20.
Casper Mae.	Student	[signature]	13/06/20

Micah. F. Maeme.	Church minister		15/06/20
Benjamin Buarafi	Pastor		15/06/20
Micah Torromea	Pastor		15/6/20
G. Sulafia	Decd		15/6/20
Jimmy-Taraemu	ELDER.		15/6/20
GIDEON MAENA	PASTOR		15/06/2020
Richard Kew	ELDER		15/06/2020
FRED SAENILE	PASTOR		15/06/20
Josiah Kaemi	ELDER		15/06/20
Konly Colin	ELDER	X	15/06/2020

Annex 9: Consent from Premier of Malaita Provincial Government

RT Form 25

SOLOMON ISLANDS

THE LAND AND TITLES ACT
(Cap. 133)

CONSENT

PARCEL NUMBER

151-008-1

(a) Full name and occupation or other description.

I *(a)* **PREMIER**, for and on behalf of the Malaita Provincial Assembly

(b) Address

of *(b)* **P. O Box 63,**
Auki, Malaita Province, Solomon Islands
being registered as the owner of *(c)* **the Fixed Term Estate in Parcel number 151-008-1**

(c) Description of the interest held by the giver of the consent.

(d) Brief details of the dealings to which consent is given, including names and descriptions of parties if applicable.

HEREBY CONSENTS to *(d)* subdivide the Perpetual Estate in Parcel **151-008-1** into two (2) plots.

Dated at Auki this 25th day of MARCH ~~2020~~ 2021

(e) In the case of execution by a corporation substitute in this part the usual form of words recording the affixing of its seal.

(e) SIGNED by the consenting party)
)
)
) Premier, for and on behalf of the Malaita Provincial Assembly

in the presence of:
Signature of Witness: .....
Name of Witness: Felix Basokukeli
Address: Malaita Provincial Government

(f) Delete the certificate where execution is by a corporation.

(f) I certify that the above - named DANIEL SUIDANI (PREMIER)
appeared before me at Auki this 25th day of
MARCH 2021, and I have satisfied myself as to his*/ ~~her*/ their*~~

** Delete the underlined*

alternatives which are inapplicable.

identity (he*/ she*/ they* ~~being identified to me by~~* (s)

(g) Insert name and address of person identifying if applicable.

or being well known to me*) and that he*/ she*/ they* freely and voluntarily signed and appeared fully to understand this instrument.

(h) If instrument executed in British Commonwealth certificate may be given by magistrate, notary public or commissioner for oaths.

Seal or stamp of office
(OR if none)
Address

(signature and description of person completing verification certificate)