

**ENVIRONMENTAL AND SOCIAL REVIEW SUMMARY (ESRS)
TINA RIVER HYDROPOWER DEVELOPMENT PROJECT (TRHDP)
SOLOMON ISLANDS**

May 4, 2017

Project Description

The TRHDP will consist of four components: (i) a hydropower facility (HPF) with an installed capacity of 15 MW to be developed and operated by an independent power producer (IPP) under a [34-year] concession and sell power to the Solomon Islands Electricity Authority (SIEA, doing business as Solomon Power) under a long-term Power Purchase Agreement (PPA); (ii) an access road to facilitate construction and allow operational access to the power station and dam; (iii) a transmission line to evacuate electricity from the power station to the Honiara grid; and (iv) technical assistance to the SIG to monitor and support project implementation and ensure social and environmental safeguard risk mitigation.

Component 1: Tina River Hydropower Facility (TRHPF) (Estimated cost: US\$185.66 million). This component is to develop, finance, construct and operate the HPF with an installed capacity of 15 MW located on the Tina River, 20 km southeast of Honiara, and will comprise:

- A roller-compacted-concrete (RCC) dam 72 m high (from foundation) located in a narrow gorge on the Tina River;
- A waterway including a 3.3 km headrace tunnel in 3.3 m diameter, surge shaft and a surface-type steel penstock in 3.0 m diameter to convey water from the dam to the power station;
- A powerhouse 5.7 km downstream of the dam site that will house three 5 MW Francis turbines and an extra bay for future installation of a fourth 5 MW turbine.

The HPF will be implemented on a BOOT basis by the PC to be established jointly by three shareholders, Korea Water Resources Corporation (K-Water), Hyundai Engineering Co., Ltd. (HEC), and SIG through its main public investment vehicle, the Investment Corporation of Solomon Islands (ICSI). The PC will enter into a 34-year PPA (including 4-year construction period) with SIEA for the sale of net available generation capacity.

Component 1 costs include the PC's cost of construction, development costs, interest during construction, working capital and contingencies.¹ ADB, Economic Development Cooperation Fund (EDCF), International Renewable Energy Agency/Abu Dhabi Fund for Development (IRENA/ADFD) and Green Climate Fund (GCF) will provide concessional financing to SIG which will on-lend the proceeds to the PC. SIG's equity share will be financed by IDA.

Component 2: Access Road (Estimated cost: US\$25 million). The access road to facilitate HPF construction and operations includes two lots: Lot 1 involving the upgrade of the existing 13.2 km road from Black Post Junction to Managikiki Village; and Lot 2 involving a 5.5 km "greenfield" road through steep heavily forested terrain from Managikiki Village to the dam and power station sites. Upon commissioning of the HPF, Lot 1 will become the responsibility of SIG and Lot 2 will

¹ The capitalization of interest during construction is justified until the plant is built and commissioned, and starts generating revenues from which the PC can repay the Government's loan with interest and charges, as is standard practice in these types of projects. This interest is for a productive purpose and will be reasonably priced with due consideration of economy and efficiency.

remain the responsibility of the PC for the duration of the PPA, after which it will hand over to SIG together with the HPF.

While the construction of the access road is included in the EPC contract under Component 1, it is presented as a separate component because its cost is ring-fenced and would be fully financed by grants from the Australia-Pacific Islands Partnership Trust Funds (APIP TF) of the Government of Australia (GOA) and GCF. Such arrangement is required in order to keep the PPA tariff at a level acceptable to SIEA, and also because a major segment of the access road is a public investment which also brings benefit to the mobility and well-being of the local communities.

Component 3: Transmission Lines (Estimated cost: US\$22.82 million). Generated power from the HPF will be evacuated to the Honiara grid through two parallel single-circuit 66 kilovolt (kV) transmission lines of 23 km to the existing Lungga Diesel Power Station. The cost of this component includes the upgrading of Lungga Power Station since the highest system voltage at present is 33 kV. Since the transmission lines are only required by the time of testing and commissioning of the HPF in 2022, the exact route has not been decided by the implementing agency, SIEA. Financing from IDA will be on-lent by SIG to SIEA. Cost in excess of these allocations will be borne by SIEA.

Component 4: Technical Assistance (Estimated cost: US\$7.0 million). This technical assistance (TA) supports the operation of the TRHDP Project Office (PO) in the Ministry of Mines, Energy and Rural Electrification (MMERE) to finance consultants to monitor overall project implementation, provide awareness building and training for various stakeholders, monitor and support social and environmental safeguard arrangements and the Gender Action Plan (GAP), maintain a Dam Safety Advisory Panel (DSAP) and an independent social and environmental monitoring agent, liaise with various government counterparts and other stakeholders, support implementation arrangements agreed under the land acquisition process, support communities in utilizing their share of project benefits for community development, and to report to the Bank and other financiers on project performance and achievement of objectives. A non-governmental organization (NGO) will also be engaged to work with landowning tribes in the upper catchment to support the first stages of establishing a protected area if community members are interested and committed to doing so. Financing from IDA and APIP will be used for this component, while SIG will provide counterpart financing. Upon commissioning of the HPF, the responsibility of the PO will be considerably reduced and will be subsequently financed by SIG.

The total cost of the project is estimated at approximately USD 216 million. The proposed World Bank Group support to the final project security and financing structure includes the following (USD million)

International Development Association (IDA) Loan	24.70
IDA Grant	8.90

The other financing sources are:

Asian Development Bank	30.00
Korea, Rep. of: Economic Development Cooperation Fund	31.60
Australia, Government of	11.00
Green Climate Fund	86.00
Foreign Private Commercial Sources (identified)	23.90

Overview of World Bank's Scope of Review

IDA's environmental and social due diligence for this project consisted of appraising technical, environmental, health, safety and social information on all components submitted by MMERE as well as ESMS documentation obtained from the private sector entity (K-water), which will hold managing shares in the Project Company, taking on the role of developer for Component 1. This included:

- Environmental and Social Impact Assessment (ESIA) for the Tina River Hydroelectric Development Project – final draft dated January 2017
- K-water's Environmental and Social Management System (ESMS)
- K-water's Sustainability Report for 2015
- K-water's Sustainability Report for 2016
- Earlier drafts of the TRHDP ESIA dated 2014 and 2015
- Phase 1 Optimization Study (Hydro Tasmania Consulting, 2010)
- Tina River Hydro Development Phase 2 Report (Entura, May 2012)
- Tina River Hydro Development ESIA Scoping Study (Entura, May 2012)
- Addendum to Tina River Hydro Development ESIA Scoping Study (Entura, June 2012)
- Land Acquisition and Livelihood Restoration Plan (April 2017)

Beginning in September 2010, WB environmental and social (E&S) specialists conducted a number of site visits to the area of the project (most recently February 2017) and had meetings with officials from MMERE, Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM), the Ministry of Lands, Housing and Survey (MLHS), and SIEA.

This Environmental and Social Review Summary was prepared and disclosed by IDA. It will be updated once the Project Company has been established and Bank staff can conduct due diligence on its ESMS.

Identified Applicable World Bank Performance Standards and Safeguards Policies

Component 1 meets the criteria in Operational Policy 4.03 *Performance Standards for Private Activities* for application of the Performance Standards, in that it will be designed, constructed, operated and owned by the Project Company established with joint ownership by K-water and SIG. Although the MMERE has prepared an ESIA for the entire project in advance of the establishment of the Project Company, the Company will be fully responsible for identifying, assessing and managing the environmental and social risks associated with Component 1. Following SIG law, the Project Company will prepare and submit its own ESIA and a Construction Stage ESMP (CESMP) to the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM) with its application for Development Consent, using the MMERE ESIA and ESMP as minimum requirements, and it will have in place the capacity to implement the CESMP. Prior to commissioning, the SPC will prepare an Operations Stage ESMP (OESMP).

Seven of the Performance Standards are applicable to this investment:

PS1 Assessment and Management of Environmental and Social Risks and Impacts

PS2 Labor and Working Conditions
PS3 Resource Efficiency and Pollution Prevention
PS4 Community Health, Safety and Security
PS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources
PS7 Indigenous Peoples
PS8 Cultural Heritage

PS5 Land Acquisition and Involuntary Resettlement is not triggered because the land for the project is being acquired from customary owners by SIG, not by the Project Company. The Project Company is not expected to be acquiring any land itself. World Bank safeguards policies OP 4.10 Indigenous Peoples and OP 4.12 Involuntary Resettlement have been applied to the land acquisition.

WBG Environmental Health & Safety (EHS) Guidelines that are applicable to this investment include:

General EHS Guidelines
EHS Guidelines for Electric Power Transmission and Distribution
EHS Guidelines for Construction Materials Extraction²

Components 2, 3, and 4 will be executed by Government entities and thus the Performance Standards are not applicable. Six of the World Bank safeguards operational policies are triggered for them:

OP 4.01 *Environmental Assessment*
OP 4.04 *Natural Habitat*
OP 4.10 *Indigenous Peoples*
OP 4.11 *Physical Cultural Resources*
OP 4.12 *Involuntary Resettlement*
OP 4.36 *Forests*

For the purposes of impact assessment and management, the access road and transmission line are considered associated projects and are taken into account in the ESIA's definition of the project area of influence. Their potential impacts and necessary mitigation measures are covered in the ESIA and ESMP prepared by MMERE and are described in this ESRS. However, because an ESRS is an instrument that applies to the Performance Standards and to private entities, topics that relate to the implementing agencies for Components 2, 3, and 4, such as their ESMS and institutional capacities, are not discussed in this document.

Finally, although community safety issues related to the dam are covered under PS4, OP and BP 4.37 *Safety of Dams* were triggered and used for the engagement of a Dam Safety Advisory Panel and for defining the Panel's functions.

Environmental and Social Categorization and Rationale

This is a category A project according to the screening criteria in IDA's Operational Policy 4.03. Categorization has been assigned due to the project type and potential impacts; its natural setting,

² Relevant for quarry operations and blasting. See also EHS Guidelines for Mining for more detailed guidance on blasting and explosives handling.

on a relatively wild river in steep, partly-forested terrain, with a catchment that is mostly primary forest; and its social setting in a remote area where most of the land is in customary ownership, most of the residents meet IDA's definition of indigenous people, and there is a history of community dissatisfaction with the impacts experienced from other development projects.

Environmental and Social Mitigation Measures

IDA's review considered the environmental and social management planning process and documentation for the project and gaps, if any, between these and IDA's requirements. Corrective measures intended to close these gaps within a reasonable period of time, are summarized in the paragraphs that follow and in an Environmental and Social Action Plan (ESAP) that is at present provisional but will eventually be negotiated and agreed with the Project Company. Through the implementation of these measures, which include the preparation of detailed ESMPs for construction and operation and sub-plans for specific impact management functions, the project is expected to be designed and operated in accordance with Performance Standards objectives.

MMERE has conducted environmental and social impact assessments and has identified risks. MMERE's ESIA and the ESMP it contains present plans and measures to address the identified impacts, such that the proposed project is designed to comply with the following environmental and social requirements: 1) the host country laws and regulations; 2) the Performance Standards; 3) the safeguards Operational Policies triggered by Components 2, 3, and 4; and 4) applicable and relevant WBG Environmental, Health and Safety Guidelines.

PS 1 - Assessment and Management of Environmental and Social Risks and Impacts

Environmental and Social Assessment and Management System. As the agency of SIG with overall responsibility for the TRHDP, MMERE has developed and disclosed an Environmental and Social Impact Assessment (ESIA) as required by PS1 and OP 4.01, also taking into account MECDM requirements. Copies of ESIA draft reports have been provided to MECDM for information. Official review will not occur until the Project Company submits its ESIA to MECDM.

An early draft of the ESIA was disclosed in-country in October 2016 and was the subject of a round of stakeholder consultations. MMERE disclosed a draft final ESIA on January 25, 2017 that is available on the project website at <http://www.tina-hydro.com/the-project/documents-reports/> and in paper copy at the Project Office in Honiara. It was disclosed on the World Bank website on January 27, 2017. It can be found at

<http://documents.worldbank.org/curated/en/768061471430569820/Environmental-and-social-impact-assessment>

The ESIA meets the requirements of the Performance Standards.

The main environmental impacts of construction are: vegetation clearance at the dam site and for the access road, downstream water quality degradation by sediment from erosion during access road construction and from installation of the cofferdams, conversion of 2.5 km of flowing water to a lacustrine environment, and movement of heavy equipment and large volumes of materials along the local road and the main road from Honiara. The main social impacts are:

positive and negative effects of salaried employment of local residents in construction, effects of water quality changes on downstream water supplies and other uses and users, and influx issues at the project site including cultural differences and communicable diseases. The ESIA and its accompanying ESMP propose mitigation measures, many of which will be detailed in separate management sub-plans listed in the ESMP Framework, to be prepared according to dates in the ESAP.

During operation, the most significant environmental impacts are significant reduction in streamflow in the 5.7-km reduced flow reach between dam and powerhouse, changes in aquatic ecology due to large daily fluctuations in flow downstream of the tailrace, and obstruction of fish movements up and down the river that may affect local fish populations. Social impacts include a benefit-sharing mechanism to be implemented by SIG and other positive outcomes such as electrification of some local communities and possible development of a reservoir fishery, impairment of ecosystem services as a result of reduction in water availability for communities along the reduced flow reach of the river, modulation of flood events and extreme low flows, and community concerns regarding dam safety.

At the corporate level, K-water has well-established HSE, Sustainability and Human Resources Policies approved by its Board of Directors and applicable to all operations of the group and its subsidiaries. Its “Vision and Strategy” includes implementation of the 17 UN Sustainable Development Goals (2015) in Korea and overseas. K-water’s ESMS received ISO 14001 certification in 2002 from IQNet and KFQ³ and has been re-certified every three years since. The current certificate is valid until October 2017. K-water has applied ISO 26000 Guidelines for Social Responsibility in developing its Sustainability Management System, the implementation of which is overseen at the corporate level by the Management Services Department, located under the office of the Senior Executive Vice Presidents. ISO 26000 covers, *inter alia*, human rights, labor, environment, and community relations and development. The company follows the Global Reporting Initiative (GRI) G4 Guidelines in its assessment of and reporting on sustainability and its disclosure of information. The reports are subjected to third-party assurance. K-water tracks and reports on energy efficiency, water use efficiency, greenhouse gas emissions, waste and effluent management, biodiversity and habitat protection/restoration at project sites, health and safety performance, hiring and workforce diversity, labor relations and employee grievances, “green purchasing”, and stakeholder engagement.

K-water’s ESMS has been developed and is implemented in accordance with ISO 14001 Environmental Management System and KOSHA⁴ 18001 Construction Project Health and Safety Management System, for which K-water has been certified since 2010. K-water developed and uses a patented Environmental Performance Evaluation (EPE) Measuring and Diagnosis System that is based on ISO 14031. K-water’s ESMS is also certified under KSI 7001 Green Management Systems.⁵ K-water’s ESMS will form the basis of the ESMS that will be put in place by the Project Company.

³ Korea Foundation for Quality

⁴ Korea Occupational Safety & Health Agency

⁵ Korea Standards Institute

Management Programs. An Environmental and Social Management Plan (ESMP) for the project is a part of the MMERE ESIA. The ESMP describes the structure and processes that will be applied to construction and operation activities to implement the mitigation measures and to assess and monitor their compliance and effectiveness. The elements of the ESMP will be taken forward and incorporated into the ESIA and ESMP that the Project Company will submit to MECDM with its application for Development Consent, as well as into the Construction and Operations ESMPs (CESMP and OESMP) that will be prepared by the Company and implemented in order to meet the project's environmental, social, health and regulatory compliance objectives and other related commitments.

The CESMP and OESMP will be components of the Project Company's ESMS and will be incorporated in the contracts for construction and operation of the project. The CESMP and the relevant management plans and programs will be in place in advance of the start of site preparation. The OESMP will be developed before commissioning of the hydroelectric facilities. The CESMP and OESMP will be maintained and developed as the project advances, and will be subject to annual review. They will also be updated as required, in the event any significant changes to the project and its environmental and social risks and impacts occur, following a Management of Change process.

The Project Company will require that contractors adopt measures and bridging documents to ensure that their management systems are compatible with K-water's HSE Policy and with the guidelines and procedures within the Project Company's ESMS and the project ESMPs. Each contractor will develop its own specific implementation plans demonstrating how the contractor intends to comply with the stipulated project requirements. All contractors' plans will be reviewed and approved by the Project Company. Contracting parties to the Project Company will be monitored on implementation of relevant project's environmental, social, health and safety requirements.

Organizational Capacity and Competency. K-water in 2016 had implemented a total of 67 projects in 24 countries; 13 of them are ongoing. One of the 13 is the Patrind Hydropower Project, in Pakistan, with financing from IFC, ADB, and other lenders. The project complied with the ESAP items relating to the pre-construction phase and prepared the required plans and management system. However, during the construction phase, IFC observed that Star Hydropower Limited (SHPL, K-Water's SPC for the project) needed to more strongly enforce the EPC Contractor's compliance IFC Performance Standards. SHPL responded diligently to findings identified during supervisions. The company commissioned a third-party Labor Audit of SHPL, the EPCC and its main sub-contractors to verify compliance of HR policies with Performance Standard 2. SHPL also engaged an independent expert for an Occupational Health Audit for EPCC and sub-contractors' campsites and working conditions. SHPL developed and implemented corrective action plans after both audits.

Part of the difficulty during the construction phase was SHPL's reliance on its owner's engineer (OE) to ensure EHS compliance by EPCC and sub-contractors. The OE's EHS&S team remained under capacity during the initial period but was later on strengthened by hiring a social expert to optimize the performance. Although the delayed reporting by the external monitoring consultant engaged by the project reduced its effectiveness in bringing significant and timely improvement in E&S performance, the project met all the IFC and other lenders EHS&S requirements and remained compliant to the Project lenders and EPA requirements.

In terms of organization, K-water will assign an experienced Chief Officer/Manager and two assistants to the Project Company to be responsible for health, safety, environmental and social (HSES) compliance. A lesson learned from the Patrind Project is that early, continuous, and authoritative presence of this manager is essential for satisfactory performance of the company, its contractors, and its consultants. Among the first functions of the HSES team will be arranging for or overseeing the preparation of the CESMP and the various management and monitoring plans, and to have the surveys that must be conducted prior to construction carried out on time.

It is possible that some of the HSES functions will be contracted to the Owner's Engineer, but the Project Company will retain the responsibility for environmental, social, health and safety compliance with ESMPs, the project's Environmental and Social Action Plan (ESAP), the Performance Standards, and applicable SIG regulations. The Project Company will ensure that the Owner's Engineer is contractually obligated to provide the necessary number of qualified personnel and will monitor to ensure that it performs according to the contract. The Project Office and Bank supervision missions will verify that these requirements are being met.

The Project Company and its contractors will ensure that all staff, as appropriate with their job profile, understand the environmental and social policies, procedures and mitigations. Contractors will be required to provide sufficient resources to manage the E&S aspects of their work. They will be required and responsible for the training and awareness of their staff on the project environmental and social setting, potential environmental and social impacts of their work activities, management and mitigation measures, and the existence of, and importance of complying with, the TRHDP CESMP and OESMP, including relevant interfacing with contractor's management systems.

Emergency Preparedness and Response. The Health and Safety Plan that the Project Company will prepare pursuant to the ESMP will address preparedness for and responses to workplace accidents during construction and operation. Prevention of dam-related accidents and preparedness for and response to them is addressed in specific dam safety plans described under PS 4 below.

Monitoring and Review. The ESIA outlines a number of monitoring plans that will be needed for the project. Monitoring will be conducted to ensure compliance with regulatory requirements as well as to evaluate the effectiveness of operational controls and other measures intended to mitigate potential impacts, as identified in the ESIA, ESMP, and individual management plans. On this basis, the Project Company will develop the specific monitoring plans that will describe the effects and indicators to be measured and the frequency, and will define roles and responsibilities for monitoring and reporting. A number of pre-construction surveys will also be implemented, including pre-construction benthic invertebrate surveys upstream and downstream of the dam.

The Project Company will keep MECDM and other regulatory authorities informed of the project performance with respect to E&S matters by way of written status reports and face-to-face meetings, as required. The Project Company will also release annual reports on environmental and social performance that will be available to the public via the Project Company's website and will present relevant sections to affected communities as appropriate. Monitoring reports will also be submitted to MMERE and the World Bank.

As required by the ESMS, the Project Company will perform a number of internal and external HSE audits and inspections periodically and, during construction and operation, the Project Company will develop and implement an audit schedule. Contractors will be required to provide HSE performance reporting on a regular basis and include audits in their respective Contractor HSE Plans.

MMERE's Project Office will have sufficient staff to provide ongoing oversight of ESMP implementation. In addition, MMERE plans to engage an Independent Monitoring Agent that will make quarterly visits to the project during construction and first three years of operations, assess compliance with the CESMP and the various sub-plans, and report simultaneously to MMERE, MECDM, and the Project Company.

Cumulative Impacts.

There are four important sources of disturbance in or near Tina/Ngalimbiu catchment that, when combined with the TRHDP, could result in cumulative impacts.

- GPPOL's Oil Palm production;
- Potential expansion of mining on the Gold Ridge tenement;
- Artisanal and commercial harvesting of timber; and
- Gravel extraction on the Ngalimbiu River.

The potential impacts that are most significant are: loss of habitat and biodiversity, pressure for land development, land disputes, challenges to local traditions and cultural practices, increases in employment opportunities, and substance abuse and criminal practices. Regarding the probability of occurrence, it should be noted that Gold Ridge Mine has been closed since April 2014 and has been sold to a local consortium that may not have the capacity to reopen it. Resumption of mining activity is not very likely, expansion of mining into the Toni or Tina catchments even less so. There are no known plans for oil palm cultivation to expand in the catchment, and TRHDP will not add to oil palm's most significant potential impacts – water pollution caused by agrochemicals and wastewater discharges. Gravel extraction is also unlikely to expand. The ESIA recommends measures to address cumulative impacts but points out the difficulties of achieving coordinated efforts by relevant actors. A second, more detailed phase of cumulative assessment will be undertaken during implementation, after which a Cumulative Impact Management Strategy will be developed.

PS 2 – Labor and Working Conditions

Human Resources Policies and Procedures: During the construction phase the peak of total workforce on site will be approximately 175 people. It is anticipated that staff will include experienced expatriate workers and locally sourced semi-skilled and unskilled labour. Accommodation for nonlocal workers will not be located on site, but in available residential properties in Honiara, to avoid the impacts on local communities that could result from the extended presence of non-local workers. It is the Project Company's responsibility to explore accommodation options on the east side of Honiara (e.g., Panatina) and at Lungga and Henderson, for workers living outside of Malango and Bahomea. The Project Company will issue and enforce a Workers Code of Conduct based on the model provided in the ESMP and will prepare an Influx Management Plan covering both the construction site and the workers' accommodations in Honiara.

Through its corporate policy, K-water is committed to the UN Global Compact, the principles of which are derived in part from the Universal Declaration of Human Rights and the ILO Declaration on Fundamental Principles and Rights at Work. These principles include protection of internationally proclaimed human rights, freedom of association and recognition of the right to collective bargaining, and the elimination of forced labor, child labor, anticorruption, and all forms of discrimination with respect to employment and occupation. K-water has had a Labor Practices Grievance System in place since 2011; it processed 55 grievances in 2015 and resolved 53 of them including grievances resolved in the following year. Contractors will be required to comply with the Project Company's occupational health and safety policies and standards.

Occupational Health and Safety. As mentioned above, K-water has current certification under KOSHA 18001 Construction Project Health and Safety Management System. K-water's risk management strategy includes training safety experts at its facilities, disseminating a culture of safety throughout the organization, extending occupational health and safety systems to its construction sites, and implementing a Risk Management System that provides for assessment of risks and development of preventive measures as well as investigation of and response to occurrences. Contractors will be required to comply with the Project Company's occupational health and safety policies and standards.

A project Security Management Plan will be developed to safeguard project personnel and property and to ensure that safeguarding activities are carried out in a legitimate manner that avoids or minimizes risks to the community's safety and security (see further discussion in the section relevant to PS 4 on Community Health, Safety and Security).

Because the project area was the scene of hostilities during World War II, it is possible that unexploded ordinance (UXO) will be encountered during land clearing and excavation. The Project Company will prepare a UXO Management Plan.

Other topics related to workplace health and safety that will be addressed in individual management plans to be prepared by the Project Company pursuant to the ESMP are: Community Health and Disease Vectors, Health and Safety, Drill and Blast, Traffic, Hazardous Materials, Accidents and Malfunctions, and Spill Prevention and Emergency Response.

Third-party Compliance with K-water Labor, Health and Safety Standards. K-water emphasizes "green purchasing" to obtain environment-friendly products from its suppliers, and it assists subsidiary companies in setting up environmental management systems. It apparently does not have systematic procedures within its procurement functions to assess the labor standards and occupational health and safety standards of prospective contractors and suppliers, and hence compliance with PS 2, either at the pre-qualification stage or during evaluation of bids or proposals. It also apparently does not routinely audit suppliers and contractors for PS 2 compliance, although its subsidiary company in Pakistan (SHPL) conducted such audits when requested to do so by lenders.

PS 3 – Resource Efficiency and Pollution Prevention

Air Emissions, Noise and Light Emissions. During construction the project activities will emit varying amounts of airborne emissions from heavy equipment, transport equipment, and generators, including carbon monoxide (CO), oxides of nitrogen (NO_x), oxides of sulfur (SO_x), volatile organic compounds (VOCs), and particulate matter. Dust will be generated from earth

movement activities and traffic. Other than GHG emissions from the reservoir, air emissions will be minimal during operations. Impacts on ambient air quality will be temporary, local, and not significant. Heavy equipment and blasting will be sources of noise and vibration– the latter potentially of high intensity but limited duration. The Project Company will ensure routine inspection and maintenance of engines, generators, and other equipment to minimize noise and emissions, as part of the project’s environmental monitoring program.

Greenhouse Gas Emissions and Resource Efficiency. The principal sources of GHG from the project during construction will be generators, construction equipment, and vehicles for transport of materials and workforce. During operation, the project will have a net beneficial effect on the country’s GHG emissions because it will enable running time of diesel generators to be substantially reduced. However, carbon dioxide (CO₂) and methane (CH₄) will be released from the reservoir as submerged vegetation decays. The ESIA estimates that annual GHG emissions from the project during operation will be on the order of 4.5 t CO₂eq/GWh, whereas the default grid emission factor for SIEA is 650 t CO₂eq/GWh. TRHDP is therefore estimated to result in estimated GHG emission reductions of 49,500 t CO₂eq/yr, and 2.48 million t CO₂eq over its 50-year lifetime. The project will not be required to annually quantify GHG emissions, since it will be producing less than 25,000 t/yr CO₂e

K-water received in 2014 the Carbon Trust Standard (CTS) Certification in recognition of its efforts in energy efficiency and GHG reduction. K-water has a program to improve energy and resource use efficiency in its partnering businesses and supply chains.

Water Pollutants. Sediment is the principal water pollutant expected from construction operations. Despite mitigation measures, there will be some increase in suspended solids concentrations in the river downstream of the construction site. The sources most difficult to control will be installation and removal of cofferdams, construction of the diversion tunnel, and placement of the concrete which will generate leachate. Erosion during land clearing and road construction, and releases of concrete leachate and wash water from the concrete batching plant are more amenable to mitigation. Domestic wastewater and gray water will be collected and treated off-site. During operations, stratification may occur in the reservoir resulting in low oxygen concentrations in the hypolimnion. However, the water for the powerhouse and environmental flow outlet will be withdrawn from the epilimnion, where anoxic conditions will not occur. Consequently, there should be no impact on downstream water quality. The Reservoir Management Plan will require frequent monitoring of dissolved oxygen and temperature at several depths to provide advance warning of any problem.

Waste and Hazardous Materials Management. The Project Company will prepare a Waste Management Plan pursuant to the ESMP. The plan will cover the collection, storage, treatment, transport, disposal, discharge, reporting and data management of all the waste to be generated during construction and operations. The plan will include site-specific procedures detailing how waste is to be managed, treated and disposed of, identifying the waste types and streams and defining waste handling contractors and final disposal sites. Proper segregation of waste will facilitate the reuse and recycling of suitable waste streams. The plan will define waste tracking procedures to allow waste consignments to be tracked from source of generation to end point. All waste producers (operator and contractors) will maintain a waste register and prepare an inspection and reporting plan. Only waste management companies approved by SIG authorities will be used for transportation, recycling and disposal of wastes generated by the project. The Project Company will undertake periodic audits of third-party waste facilities and sites to verify

that wastes are being managed in line with company's standards and methods, as defined in the relevant contractual agreement.

A Hazardous Materials Management Plan will be implemented to address handling and storage of fuels and other hazardous materials that are used or stored at the site, ensuring compliance with SIG laws and regulations and consistency with WBG guidelines. Hazardous substances will be stored within sealed containers in areas bunded to prevent and contain accidental spills. Fuels and other hazardous chemicals will be stored according to industry best practice including containments that can accommodate 150% of the total storage volume and are covered to prevent rainfall entering the containment basin. Hazardous material training will be provided to project personnel.

Other individual pollution prevention and management plans that the Project Company will prepare will address: Stormwater Management, Post-construction Rehabilitation, Watercourse Crossing, Hydrocarbon Management, Point Source Pollution, Spoil and Topsoil Management, Forest Clearance, Erosion Control, Air Quality and Dust Control, and Noise and Vibration.

PS 4 – Community Health, Safety and Security

Community Health and Safety.

The ESIA study area encompasses more than 30 villages and hamlets of mainly indigenous people originating from the central Guadalcanal mountain lands, and several official "settler" villages made up of people originating from South Guadalcanal/Weather Coast. The Bahomea villages and their component hamlets are mainly distributed adjacent to the Ngalimbiu River and lower-mid sections of the Tina River, and are often only hundreds of meters apart. Settlements range in size from two-house hamlets with one extended family, up to villages with dozens of houses and over a hundred residents. The mountainous interior of Malango Ward – i.e., the upper catchment of Tina River -- is essentially unpopulated, apart from periodic expeditions by the traditional owners for hunting and camping, and to reconnect with customary 'homelands'.

Dam Safety. The dam poses a risk to downstream communities in the unlikely but possible event of dam failure. The history of catastrophic floods in the Tina River has sensitized residents, and dam safety was a major concern voiced in community meetings during ESIA preparation. The Project Company's dam safety consultant will prepare the various dam safety plans identified in World Bank Operational Policy 4.37 Safety of Dams, in order to comply with this aspect of PS 4:

- Construction and Quality Assurance Plan
- Operation and Maintenance Plan
- Instrumentation Plan
- Emergency Preparedness Plan

These plans will be reviewed by the independent Dam Safety Panel engaged by the Project Office. The Panel has also provided advice on dam site selection and on design, with particular focus on seismic and flood risk. Community members will be briefed on aspects of the Emergency Preparedness Plan relevant to the actions they should take in the event of an accident involving the dam.

Other health and safety issues. The Project Company will disseminate and enforce a Workers Code of Conduct based on the outline in the ESMP. The Code covers working hours and conditions, safety, driving, socially and culturally appropriate behaviour, alcohol and drug use, prohibition on hunting and fishing, driving and use of vehicles, conflict and violence, gender based harassment and cultural heritage protocols. The Code of Conduct should also set a dress code for all workers who interact with local communities. The Project Company will require the EPC contractor to conduct Code of Conduct pre-commencement training with workers.

The Project Company will develop a Community Health and Disease Vector Management Plan to minimize the risk and adverse impacts to community health that may arise from project activities. An Influx Management Plan will be developed in consultation with local communities and regional authorities to reduce and manage project-induced in-migration to the area of the project and minimize associated negative impacts to community health and safety as well as social conflict and clashes of culture near the project and at workers' housing in Honiara. A Traffic Management Plan will be prepared to minimize risks of injury or property damage in communities through which trucks and heavy equipment will move to and from the project. The Hazardous Materials Management Plan will limit community exposure. Other plans mentioned under PS 3 above will contribute to community health and safety; they include plans to manage noise and vibration, water pollution, air emissions and dust, and drill and blast.

Ecosystem Services

Tina River provides important ecosystem services to the communities in its valley. It provides water for drinking, bathing, washing, recreation, fishing (though fresh-caught fish are not a major protein or livelihood source for residents along the Tina), and transport of logs. Its valley is a corridor for foot traffic among villages. Changes in quantity and quality of water will adversely affect these ecosystem services. Mitigation measures include: provision of temporary or permanent alternative water supplies for villages where diminished flow and construction impacts on quality curtail residents' use of river water; maintenance of environmental flows, discussed further under PS 6; avoidance of extreme daily fluctuations in flow; provision of a trap and haul fish passage system (also discussed under PS 6); and alternative arrangements for log transport.

Security

The Project Company will recruit security personnel or services from the local communities. Project security systems will comply with SIG laws and regulations as well as the requirements of the UN Code of Conduct for Law Enforcement Officials and UN Basic Principles on the Use of Force and Firearms by Law Enforcement Officials. The security system will include, among other things, selection of personnel based on a careful background screening, training with regards to human rights requirements, and monitoring of performance. The Project Company will develop a Security Management Plan to guide security functions at the construction site and any security provided to staff accommodations in Honiara.

PS 6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources

The ESIA presents baseline information on terrestrial and aquatic ecology in two separate chapters, and the assessments of impacts are also presented in two chapters.

Baseline Conditions

A total of 161 plants species were identified during field surveys. Among them 5 species are listed as being vulnerable, and 19 are listed as being threatened. The primary habitats of the study area are comprised of forested and non-forested ecosystems, which represent a mix of modified and natural habitats. The level of disturbance increases with distance downstream in the catchment. The upper Tina River catchment, upstream of the dam site, is dominated by highly valued, undisturbed lowland forests, whereas, the area downstream of the dam site near Choro, is dominated by disturbed forests. This is mainly the result of anthropogenic activities (e.g., logging, settlements, gardens, trails, etc.). Disturbed areas such as Black Post Road, and the proposed access road and transmission line corridor, are colonized by invasive plant species. The pristine montane forests found in the upper Tina River catchment will not be directly affected by the Project.

The fauna baseline study has shown that wildlife species thrive in pristine forests of the upper Tina River catchment, but also in the more anthropogenically altered areas in the middle and lower reaches of Tina River. A total of 60 wildlife species were observed by the ESIA team in the study area (which encompasses the project affected area and wider catchment), including 9 amphibian, 5 reptile, 41 bird, and 5 mammal species, 68% of which are endemic. This includes 7 endemic amphibians, 1 endemic reptile, 32 endemic birds and 1 endemic mammal.

There are no formal protected areas or proposed protected areas that could be affected by the TRHDP. Informal protection of many small, natural sites called “Tambu” is provided by the local population, which protects these areas in a traditional manner.

Current water quality in the Tina River does not appear to be a limiting factor for aquatic life, given the low level of pollution. The householder survey along Tina River shows that fresh river fish does not feature prominently in people’s diets, and that canned tuna is now the main source of fish protein. Fishing is a significant source of livelihood only at the mouth of the Ngalmibiu River, where semi-commercial fishing occurs using mosquito seine nets, gill nets, and other methods. Regarding aquatic ecology, 59 species of fish were recorded within the Tina/Ngalmibiu River system, from the upstream catchment area to the mouth of the river.

Like other tropical islands of the Indo-Pacific Region, all native species encountered in inland fresh water are migratory species with a life cycle that alternates between ocean and river. Two main migration patterns are followed: catadromous and amphidromous. Eels are catadromous fish with adults migrating to the ocean to spawn, and juveniles migrating back into freshwater systems to grow to maturity. During their upstream migrations, juvenile eels are able to climb to the upper reaches of the Tina River. Most of the other species are amphidromous. Spawning occurs in the rivers, and larvae drift passively to the ocean before migrating back as juveniles to the freshwater system where they grow into adults. The factors triggering upstream migration of juveniles are not completely understood. However, it is postulated that flooding, which causes high turbidity, and lunar cycles, plays a role for triggering migration in some species. Without mitigation measures, the hydroelectric project will impact fish migration to, and production within, the upper Tina River catchment.

The upper Tina River plays an important role in fish life cycle but not an essential one since:

- ▶ fish within Solomon Islands do not show natal stream homing behavior. Rather, juveniles will colonize any rivers to which they can gain access; and

- ▶ the mouth of the Ngalimbiu River is more critical to the life cycle of most fish species than upstream areas, as it is the only entry point to all fish that live within the catchment.

Based on current knowledge, the upper Tina River is a highly valued aquatic natural habitat but not a critical habitat for fish species present in Guadalcanal.

Biodiversity and Ecosystem Services Impacts and Mitigation Measures

Construction activities will necessitate clearing approximately 115.49 ha of natural vegetation in the Core Area, approximately 50 ha of which is disturbed forest and 9.5 ha of which is undisturbed forest, to create an access road and to prepare the reservoir area. This represents 0.9% of the total non-montane forest in the catchment. Measures to mitigate impacts include conducting a pre-construction road alignment survey to delineate environmentally sensitive areas where valued or protected species are to be avoided or, where avoidance is not possible, transplanted where feasible. Changes in road alignment may be necessary based on this survey. Good international industry practice (GIIP) will be implemented by the construction contractor that is responsible for forest clearing to minimize impacts, including maintaining canopy trees where possible. Site restoration using native plant species will be undertaken in affected areas to minimise the potential for invasive plant species to become established. Project operation will necessitate vegetation control under the transmission line. Herbicides will not be used for vegetation clearance.

For the purpose of habitat analysis, the study area has been divided into three sub-regions based on elevation: the higher elevation area of the upper Tina River catchment (above 400 masl) which lies to the south, and is dominated by undisturbed montane forests; the mid-elevation river gorge area which is dominated by lowland forests modified by extensive logging and semi-commercial timber operations, as well as gardens and habitation clearings; and the lower elevation area which is dominated by grassland and plantations within the downstream (northern) Tina River catchment. The degree of anthropogenic modification increases markedly with decreasing altitude, with a large proportion of the Project area comprising modified habitats.

The TRHDP will be located within the mid-elevation river gorge and downstream catchment areas where human settlements and commercial logging activities have previously contributed to habitat alteration. There are no critically endangered or endangered terrestrial⁶ or aquatic species found within these project-affected areas, no areas associated with key evolutionary processes, and no globally significant numbers of migratory or congregatory species. Whilst there are endemic species, the habitat available within these project-affected areas represents only a small portion of larger habitat area available to these species adjacent to, and upstream of, the proposed development. In addition, there is no evidence of unique assemblages of species within the project-affected area that do not otherwise occur in other locations on the island of Guadalcanal.

Except for the upper catchment area, most habitats in the vicinity of the project site are not in a pristine state, having been used and degraded, to a certain extent, by human activity including clearing land to establish settlements and gardens, and commercial and artisanal logging.

⁶ The Emperor Rat (critically endangered), King Rat, and White-eyed Starling (both endangered), that could use the Direct Impact Area have not been observed there in recent years, may be extinct and, in any case, would not be dependent on this habitat for survival, according to the Draft Biodiversity and Habitat Analysis (prepared for ADB by Kevin Jeanes, February 2017).

The undisturbed montane forest above 400masl in the upper catchment to the south and east of the dam site and reservoir qualifies as critical habitat. First, it is considered to be a globally highly unique ecosystem, based on assessments by UNESCO, Birdlife International, WWF, and Critical Ecosystem Partnership Fund (CEPF). Second, its biodiversity has high local importance due to its role in traditional practices and cultural identity. Third, it overlaps with a proposed protected or conservation area -- the Mount Popomanaseu region that is within the “Tropical Rainforest Heritage of Solomon Islands” World Heritage site on UNESCO’s tentative listing.⁷ As noted above, habitats within the mid-elevation river gorge area and the lower elevation flood plain have been anthropogenically altered to varying degrees. However, there are areas of undisturbed lowland forest below 400 masl that appear to qualify as critical habitat by virtue of being part of a globally unique ecosystem.⁸ These areas are not within the Direct Impact Area.

The TRHDP footprint represents a very small proportion of the overall Tina catchment (<3% of land area), and does not directly impinge on the Critical Habitat. To mitigate against indirect impacts to the Critical Habitat, measures will be put in place through the Project Company, Tina Core Land Company (TCLC) and customary landowner shareholders to restrict access (including preventing commercial logging traffic) to the upper Tina River catchment via the project access road, to raise awareness of the importance of the upper catchment, to monitor logging truck activity on the existing logging road, to monitor changes in forest cover, and to encourage SIG to enforce the statutory restriction on logging at elevations above 400 masl, in effect helping to preserve this area from future resource exploitation.

With respect to impacts on natural habitat, the project’s Environmental and Social Management Plan includes mitigation measures to achieve no net loss of biodiversity. These will be detailed in a Biodiversity Management Plan that will be prepared prior to mobilization for construction.

The access road would be an agent of change in the area if access is not controlled, facilitating access for logging and attracting new settlers. To prevent adverse induced impacts, the road will be gated and access will be restricted to the landowners. Commercial logging trucks will be prohibited. As part of the financing provided for the Project, SIG will provide funding to an NGO to undertake studies and consultations to determine the feasibility of establishing a protected area in the upper catchment of the Tina River. The NGO will work closely with customary landowners as in Solomon Islands, establishment of a protected area should originate with the customary landowners of the land. The Bank plans collaboration with the European Space Agency to monitor changes in forest cover in the upper catchment.

Unlike the forests in the upper catchment, the Tina River itself does not meet the critical habitat definition. It does not shelter endangered fish species (see table of fish species for definitions). Although all fishes are migratory within the Tina River catchment, fishes in Solomon Islands do not show homing behaviour, meaning that juveniles can colonize any river, rather than just their natal stream, and do not depend on a particular river for support. The upper Tina River also does not satisfy the definition with respect to endemic or range-restricted insect species in the groups that were sampled for the ESIA or in the literature. All identified endemic insect species have also been identified as present in a number of other river catchments within Guadalcanal outside of the study area and well outside of the area of impact for the Project.

⁷ the Draft Biodiversity and Habitat Analysis (prepared for ADB by Kevin Jeanes, February 2017).

⁸ Ibid.

Most impacts to the aquatic ecosystem of the Tina River, including fish and other aquatic organisms, are associated with the physical presence and operation of the dam and power station. Potential impacts during construction are short-term, mainly involving increases in suspended sediment concentrations and turbidity downstream as a result of land clearing and cofferdam installation. Possible spills of fuel, concrete washwater, and other chemicals could also affect water quality. Mitigation and monitoring measures including sediment traps and fuel tank bunding are included in the ESMP to address these impacts.

Flow in the 5.7 km reach of river that is bypassed by the headrace tunnel would be drastically reduced, except in periods of heavy rainfall when water would spill over the dam. Simulation of the hydro operation indicated that floods or freshets would occur on average every 6 weeks, and their average duration would be between 4 to 6 days. Release of an environmental flow of $1 \text{ m}^3/\text{s}$ will be required to avoid damage to the aquatic ecosystem in that reach; this has been determined to be sufficient to preserve the aquatic ecosystem and permit fish movement up and downstream. The $1 \text{ m}^3/\text{s}$ EF release at the base of the dam would act as an attraction flow to attract fish into the area for trapping before being hauled over the dam, as described below. It will have the further advantage of ensuring river users along the by-passed section of river (i.e., at Choro, Koropa, Sengue) continue to have access to some water, and that the aquatic ecology of the by-passed stretch of river is supported. Villages located along the bypassed section that depend on the river for drinking will be provided with alternative water supplies.

The dam and reservoir, and to some extent the associated by-passed section of the Tina River, will represent a barrier to the upstream and downstream migration of all native fish species that currently utilise the river system upstream of the dam site. Unless mitigation measures are implemented it is anticipated that most of, if not all, native fishes will disappear from the upstream Tina River catchment. In addition, fish mortality in the powerhouse turbines is a potential impact, as fish become entrained into the power intake of the reservoir and are conveyed to the turbines via the headrace tunnel and penstocks. Mortality of upstream migrating juvenile fish would also occur if they are attracted to the outflow of the powerhouse and then climb into the turbines.

The EF of $1 \text{ m}^3/\text{s}$ would be required to enable fish to move up the by-passed section of river to the base of the dam. This EF would be supplemented naturally by up to $1 \text{ m}^3/\text{s}$ of additional dry season inflow from the lateral tributaries to the by-passed section. Fish density and species richness are likely to be greater with a flow of $1 \text{ m}^3/\text{s}$ than with the current median flow of $11.1 \text{ m}^3/\text{s}$. A $1 \text{ m}^3/\text{s}$ flow will provide for fish passage and maintain pool habitat for the pool dwelling species and good riffle habitat for the riffle dwelling species that comprise the majority of fish in the river. In addition, the study suggests there will be an improvement in habitat quality resulting from a reduction in the amount of fine gravel and sand in the river channel.

A minimum of $2.4 \text{ m}^3/\text{s}$ will be released to the river from the powerhouse during nighttime hours and those parts of the day when power is not being generated to maintain habitat for aquatic organisms downstream and dampen somewhat the fluctuations in flow between full power generation and reservoir refilling. When combined with the $1 \text{ m}^3/\text{s}$ EF release from the dam, this will mean a minimum dry season flow in the river immediately below the powerhouse of $3.4 \text{ m}^3/\text{s}$ -- more if small upstream tributaries continue to discharge during the dry season.

An extensive examination of alternative technologies to enable fish migrating upstream to pass the dam led to the conclusion that a combination of a trap-and-haul system at the dam and an EF of $1\text{m}^3/\text{s}$ from the dam, is considered the only potentially viable system to ensure fish can continue to populate the upper catchment area. If necessary, this would be further augmented by netting swimming species of fish as they congregate in the mouth of the river or at the base of the dam, for transport and release above the dam. The proposed mitigation would be undertaken using an adaptive environmental management approach in accordance with the EBRD's policy for hydropower projects. This approach would evaluate the effectiveness of the system, and look at other means of ensuring upstream fish passage, in the event that a trap-and-haul system is not successful.

Installation of fish screens is recommended at the power intake structure to prevent entrainment of eels during their downstream migration. This should be supplemented with periodic releases over the spillway to facilitate movement of adult eels during peak migration conditions. Likewise, a fish barrier or repelling system is recommended for installation in the powerhouse tailrace to prevent mortality of upstream migrating juvenile fish when they enter the turbines. Further, it is recommended that the potential to farm fish within the reservoir be considered if this could be accomplished using species of fish that are native to the Solomon Islands, and which could thrive in a lentic environment. Monitoring of species would need to be done to verify the efficacy of such a program.

Although, none of the fish species utilizing the Tina/Ngalimbiu River system will be permanently lost from Solomon Islands if these mitigation measures are not implemented, the loss of viable fish populations from the upper Tina River catchment is an unnecessary impact that can largely be avoided, given the apparent efficacy of mitigation measures that are available.

Fish populations and benthic invertebrates will be monitored upstream of the dam beginning prior to construction in order to determine actual impacts on fishes and the aquatic ecosystem in this pristine portion of the Tina River and provide a basis for adaptive management if needed. Aquatic invertebrates will also be monitored downstream, since they are good indicators of long-term impacts on water quality.

The project's Biodiversity Management Plan (BMP) will include measures to achieve no net loss of biodiversity as a result of natural habitat conversion, degradation, or fragmentation in the area of influence, including protected set-asides, restoration of areas temporarily disturbed, and offsets in the form of rehabilitation of modified habitat. It will also contain wildlife management measures to protect fauna that may pass through or reside in the project footprint, including prohibition of hunting and on-call experts to assist in relocations. The requirements for minimum flows that have been established in the ESIA and the provisions in the design to move migrating fish past the dam are also measures that contribute to no net loss of biodiversity in the aquatic ecosystem. Impacts the project may cause, if any, on the river upstream of the reservoir are difficult to predict, and the BMP will therefore link to the monitoring plans so that benthic organisms, fish fauna, and water quality are monitored upstream of the reservoir. Findings of adverse impacts will lead to adaptive management measures. The BMP will describe the potential benefits to the ecosystem, the communities, and the project that would be derived from establishing the upper catchment as a protected area and will describe: (a) the process for according protected status to customary land – a process that is community-driven; (b) actions that have been taken in the past; and (c) actions that the project and the Bank could take to promote and facilitate protection. Such actions could include monitoring and reporting on changes in forest cover using satellite imagery, observing trends in logging truck traffic into and out of the catchment, restrictions on access to the catchment implemented by the Project Company and the Land Company, and providing technical advisors to communities to prepare the forest management plans they would need if they were to choose to apply to SIG to obtain protected area status.

PS 7 – Indigenous Peoples

The ESIA and LALRP were developed and will be implemented in line with World Bank requirements on Indigenous Peoples (Performance Standard 7 and OP 4.10 – Indigenous Peoples). While a private sector entity is taking the lead role in management of environmental and most social impacts related to the construction and operation of the hydropower facility, a public sector agency has been responsible for preparation of the project and the procurement of a private developer, and will also retain responsibility for land acquisition, livelihood restoration, and some aspects of benefit sharing (together with the private sector entity), all of which have particular significance to indigenous communities. The project ESMP also includes provisions for water supply and potential impacts on fisheries and gravel extraction to address social impacts and risks which the private sector entity will be responsible for. The key policy for the project during preparation has been OP 4.10, and relates to all preparation activities, including feasibility studies and associated, extensive community consultations, and the acquisition of land by the Government. OP 4.10 sets a standard of, “*free, prior and informed consultation resulting in broad community support.*” Broad community support has been achieved for the project by the government and this is documented in detail in the ESIA and LALRP. In line with OP 4.10, there was no need for the preparation of an Indigenous Peoples Plan because of the fact that the vast majority of project beneficiaries are indigenous. The elements of an IPP have been incorporated into the design of the project, as per OP 4.10. The ESIA and the LALRP also comply with OP 4.10 by following guidance on project engagement with indigenous peoples. The ESIA details: 1) the outcomes of a comprehensive social assessment for the project, 2) how the project-affected communities have been provided a clear understanding of the Project and have been properly consulted regarding their issues and concerns; 3) how free, prior and informed consultation leading to broad community support has been achieved; 4) how the TRHDP PO has engaged with customary land owners / indigenous peoples since early in the planning process, to receive their input; and (5) details on how the Project Company will be obligated to achieve and

maintain free, prior and informed consent as required by PS7. For works and activities executed by the soon-to-be-formed Project Company, PS 7 is the applicable standard for management of indigenous peoples' issues. Therefore, PS 7 will be the applicable policy going forward into the construction and operational periods. PS 7 requires "*free, prior, and informed consent*" (FPIC) in establishing agreements with indigenous communities for project activities.

PS 8 – Cultural Heritage

There are no cultural heritage sites within the project study areas that are formally protected under the Guadalcanal Historic Places Ordinance 1985. So far, based on information gathered by the ESIA team, there are no "critical" cultural sites or relics to be found within the area that cannot be relocated, or compensated for, if disturbed or destroyed. According to the information available for the ESIA, there are a number of sacred sites, the approximate location and nature of which are known in confidence and will inform the cultural heritage sites monitoring program.

Finding complete information about cultural heritage is difficult. Some communities do not impart information or knowledge about their cultural heritage easily, especially when it comes to dealing with cultural and historical sites. There are some sites that are sacred or still considered to have powers that people no longer want to talk about, because they fear getting sick or dying prematurely. Sacred sites may be owned by, or have particular importance to individual groups or clans, and underpin notions of identity and land ownership. Knowledge of the location and meaning of tambu places can, therefore, be a proof of land ownership. Thus, the information can be highly confidential. This appeared to be the case in some of the communities the ESIA team visited.

As a result, the ESIA is limited as far as baseline studies of cultural heritage in the project area are concerned. Because most of the knowledge is kept confidential, investigators were not able to gain detailed information to locate all sacred or cultural sites for the potentially affected communities and landowners. In some cases, broad descriptions were provided during interviews with senior men. Riparian surveys conducted by Pacific Horizons Consulting Group (PHCG) in 2011 noted and mapped the locations and names of various streams and features between the upper end of the Tina River catchment and Pachuki (see Section 5 –Physical Environment Baseline). In addition, the approximate locations of some old villages were recorded. During the ESIA village workshops, the names of originating villages and the sequence of village settlements prior to the current settlement patterns were recorded, though exact locational data was not obtained. Also, the existence of present day graves and other cultural features were noted during the village workshops, though except in the case of Mangakiki and Verakuji villages, their exact locations were not recorded.

The ESIA recommends that, prior to commencing any construction on the access roads or on the hydropower development sites, the SIG or project developers carry out a more detailed cultural heritage and sites monitoring program within the designated Core Area, and in the communities adjacent to any road building or upgrading. This monitoring should be undertaken by a suitably qualified heritage expert, working closely with the landowners, accompanied by an advisor from the National Museum. The information obtained should be managed in a way that is both culturally acceptable and practically useful in preventing loss or damage during construction. Also, prior to construction, the TRHDP should be required to implement a protocol for managing cultural heritage (see Annex 18 of the Annex Report and the ESMP).

Stakeholder Engagement

Mitigation workshops were held in February 2014 during ESIA preparation to meet with communities and present information on potential impacts of the Project, along with a first draft of possible mitigation measures. The aim of the workshops was to exchange ideas on these measures and to obtain input on people's issues and concerns, including any grievances, regarding the potential project impacts. Following these workshops, stakeholder issues and concerns were addressed in the impact assessment and mitigation sections of the ESIA. Mitigation measures were adapted to local population needs and aspirations.

An earlier draft of the ESIA (August 2016) was presented to and discussed with representatives from Tina River communities at two workshops conducted by the MMERE Project Office – for the downstream communities of Ghaobata at GPPOL 1 Community Hall on November 1, 2016, and for the upstream communities of Bahomea and Malango at Tina Village on October 31, 2016. The same draft was discussed at a workshop for environmental and social NGOs and officials from MECDM at the Project Office on October 20, 2016.

According to the Environment Act of 1998, once the Project Company has submitted its own ESIA to MECDM, the Director of Environment and Conservation will cause it to be published for a 30-day comment period, during which time any public authority or affected person may submit written objections to the project. The Director must consider the objections before making a decision on the issuance of a consent for development.

Local Access to Project Documentation

Copies of the draft final ESIA have been made available at the Project Office and on the project website: <http://www.tina-hydro.com/the-project/documents-reports/>

In addition, the Environmental and Social Review Summary (ESRS) and the Environmental and Social Action Plan (ESAP), together with the ESIA, will be available at the following location:

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c/o Ministry of Mines, Energy and Rural Electrification
Second Floor, Hyundai Mall
PO Box G37 Honiara
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Contact: Mr. Fred Conning