

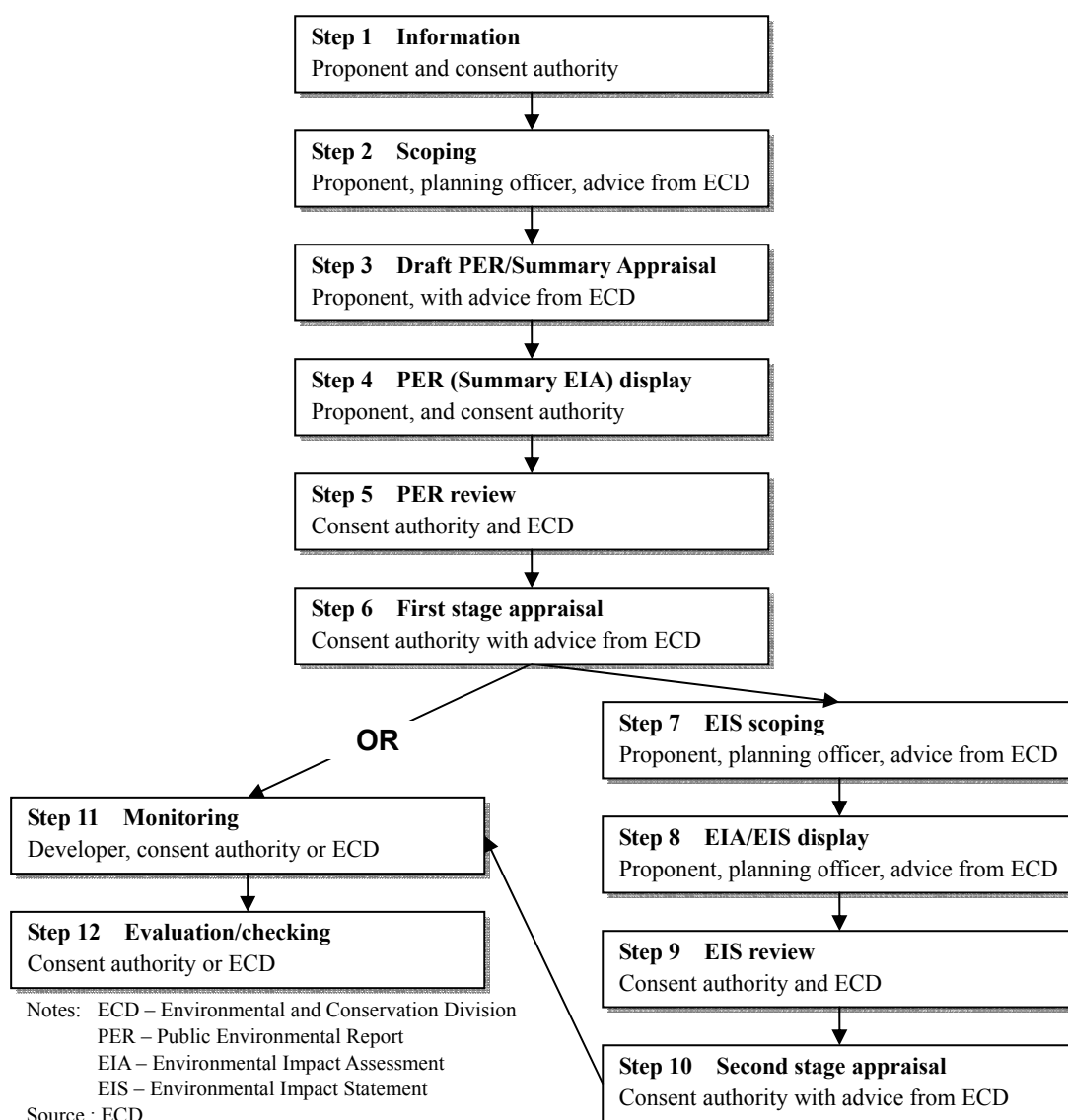
# **PART H**

## **ENVIRONMENTAL AND SOCIAL CONSIDERATIONS**

## PART H Environmental and Social Considerations

### H1 EIA Process in Solomon

Solomon Islands Environment and Conservation Division (ECD) in the Ministry of Natural Resources provides *Solomon Islands Environmental Impact Assessment Guidelines* (hereinafter referred to as “the Guideline”) for planners and developers. Figure H1-1 shows the steps recommended in the Guideline. The proponent of project submits the draft public environmental report (PER) or summary appraisal.



**Figure H1-1 Steps of PER/EIA Process**

In order to get approval from ECD, proponent of this project has to submit the draft PER or summary appraisal to ECD in line with the Guideline. The following activities are proposed in this project.

#### <Pilot Projects>

- (1) Formulation of tariff collection improvement method
- (2) Establishment of leakage reduction indicators
- (3) Water conservation campaign
- (4) Installation of shared standing pipes

**<Facility Improvement Plan>**

- (5) Improvement of water supply system in Honiara
- (6) Improvement of water supply system in Auki
- (7) Improvement of sewerage system in Honiara

**<Urgent Rehabilitation Plan>**

- (8) Follow-up cooperation plan for Honiara
- (9) Urgent Rehabilitation Plan for Tulagi

In implementing the pilot projects, facility improvement plan and urgent rehabilitation plan mentioned above, SIWA and JICA Study Team do not require to follow the EIA procedure shown in Figure H1-1 because of the following reasons.

Project (1) does not include physical development but institutional development. In the Project (2), existing pipes with much leakage are replaced to reduce leakage volume, so that it is categorized as rehabilitation works. Project (3) is an activity to enhance repair and maintenance of leaking taps and water conservation in households and institutions. Project (4) includes engineering works such as digging drainage and laying distribution pipes. The standing pipes installed are for domestic use, so that it is not required to follow the Guideline.

Project (5) to (7) need the PER to identify and assess any possible negative impacts on environmental and social conditions in line with the Guideline.

Project (8) is also categorized as rehabilitation works of the existing facilities which were constructed under Japan's Grant Aid in 1998, so that it is not required to follow the guidelines. Project (9) is planned as the urgent rehabilitation and its content is only installation of chlorination equipment. Therefore, no impact is expected as the scale of the project is small.

## **H2 Environmental Impact of the Projects for Honiara**

### **H2.1 Categorization and its Reason**

This project is categorized as B type because there are little environmental and social impacts. However, issues of water right in the customary land should be carefully taken into consideration.

### **H2.2 Overall Environmental and Social Condition on the Project Area**

#### **(1) Population**

Table H2-1 shows the population and the number of households in Honiara at present (2005) and the target year (2010) for the facility improvement master plan in the Study.

**Table H2-1 Population and Number of Households in Honiara (2005 and 2010)**

	2005	2010
Population	60,365	71,695
Household	8,502	10,098

Source: Predicted by the Study Team based on 1999 Population and Housing Census

#### **(2) Race**

Melanesian is dominant. However, there are also other influences through people from Micronesia (mainly Kiribati) and Polynesia, and small European and Chinese populations. Recently there was ethnic tension, which has had far-reaching consequences for Solomon Island's economy and society.

### **(3) Land Use**

In Honiara, most of the town area is developed and utilized as residential and commercial area. Most of the roads belong to the public land. There is an enough space of about 3 m width on both sides of the road, where pipe line can be laid. Moreover, boreholes and the related facilities can be constructed in the additional space along the roads.

### **(4) Land Ownership**

The ownership of the land is the sensitive issue in the Solomon Islands. The land of Solomon Islands is divided into three groups, such as town, alienated land and customary land. Town and alienated land are controlled by the government under the modern laws and regulations. In the alienated land, however, some disputes occur between the government and the native tribes as the land is originally customary land which was recently transferred to the government. Customary land is traditional common land owned by native tribes. The registration procedure is on the way. However, there still remains no clear boundary and unclear ownership in some areas. Some water sources and facilities of SIWA are located in the customary land. Discreet and sensitive management is requested.

### **(5) Environment Protected Area**

There is no protected area in/around the project area. No endangered/valuable species is reported in the project area.

### **(6) Natural Condition**

Most of the areas are situated on the gentle hills or plains. Limestone is the dominant geology in the area. Rainfall of Honiara is as shown in Table H2-2.

**Table H2-2 Average Annual Rainfall for Honiara**

	Honiara
Rainfall (mm)	2,154

Source: Department of Communication, Aviation and Meteorology

Plenty of spring can be found in Honiara area. But dug well can not be found in Honiara, and there are a few existing boreholes except for boreholes owned by SIWA. No hazardous chemicals have been found in the ground water.

## **H2.3 Adverse Environmental and Social Impacts**

For environmental and social consideration, proposed project for Honiara has been evaluated by the check list as shown in Table H2-3. The proposed project consists of the following components.

### **(1) Water supply system improvement project**

Following 3 (three) options have been proposed as the water supply system improvement projects in Honiara.

- Option J-1
- Option J-2
- Option J-3

Among the above options, Option J-1 will be evaluated hereinafter because the number of boreholes to be newly developed is the biggest and therefore the impact on the environment is considered the largest.

## (2) Sewerage system improvement project

The main component of this project is the rehabilitation of the sewage outfall structures. It has been adopted from the optimum option for the sewerage system improvement project proposed in the AusAID report. The optimum option has been selected in view of financial aspect and environmental impact aspect. Therefore, only one option has been evaluated hereinafter.

## (3) Evaluation results

The proposed project has three aspects, that is, improvement of water supply system, development of ground water, and improvement of sewerage system. Therefore, each component is also evaluated by the matrix for scoping as shown in the following tables.

**Table H2-3 Check List for Scoping (Honiara)**

	Item	Evaluation	Reason	
Social Environment	1	Resettlement	D	Most of the new facilities will be constructed under public roads and inside public lands. Therefore, resettlement will not occur.
	2	Economic Activities	D	No impact on local economic activities is expected.
	3	Land use and utilization of local resources	D	Facilities will be constructed in the public land and the scale of the facilities is small. Therefore, no impact is expected.
	4	Social institutions and local decision making	D	No impact is expected.
	5	Existing social infrastructure and services	D	No impact is expected.
	6	The poor, indigenous and ethnic people	D	No impact is expected.
	7	Misdistribution of benefit and damage	D	No impact is expected.
	8	Cultural Property	D	No impact is expected.
	9	Water rights and Rights of Common	B	There remain some issues on the water rights and rights of common in the customary land, even after the legal resolution between the government and the land owners. Careful dealing is requested.
	10	Public health condition	D	The public health condition will be improved by the project.
	11	Sanitation	B	Sludge must be treated adequately.
Natural Environment	12	Topography and Geology	B	During construction of new well facilities, topography and geographical features may be slightly affected.
	13	Groundwater	B	Development of groundwater may cause some impact. It is necessary to formulate the appropriate plan in order to avoid the serious impact.
	14	Hydrological situation	B	Development of water resources may cause some impact on hydrological situation. It is necessary to formulate the appropriate plan in order to avoid the serious impact.
	15	Coastal zone	B	Fishery and coral reef should be taken into consideration. However, the impact will be small if any because sewage discharged to the sea is small.
	16	Landscape	B	Construction of facilities may cause small change of landscape.
	17	Fauna and flora	D	No impact is expected. No record of valuable species. Scale of facilities is small.
Pollution	18	Air pollution	D	No impact is expected.
	19	Water pollution	B	Drainage and sludge shall be treated adequately.
	20	Soil Contamination	D	No impact is expected.
	21	Noise and Vibration	B	Pumping and generator may cause noise and vibration. However the impact will be small because the scale of pump facilities is small.
	22	Land subsidence	D	No impact is expected.
	23	Offensive odor	B	Odor from sludge drying facility is expected.
	24	Bottom Sediment	D	No impact is expected.

Note: Evaluation categories

A: Serious impact is expected, B :Some impact is expected, C : Extent of impact is unknown (Examination is needed. Impacts may become clear as study progress), D: No impact is expected. IEE/EIA is not necessary.

Source : JICA Study Team

**Table H2-4 Matrix for Scoping (Water Supply)**

Name of Cooperation Project		The Study for Rehabilitation and Improvement of Solomon Islands Water Authority's Water Supply and Sewerage Systems										
	No.	Likely Impacts	Overall Rating	Planning Phase		Construction Phase		Operation Phase				
				Land acquisition	Change of land use plan, restriction of various activities by constructing new facilities	Construction of well facilities and water supply facilities	Construction of filtration facilities	Operation of construction equipment and vehicles	In taking excessive water from rivers, lakes, etc.	Drainage	Operation of related facilities	Appearance/ Occupancy of related building structures
Social Environment: *Regarding the impacts on "Gender" and "Children's Right", might be related to all criterion of Social Environment.	1	Involuntary Resettlement										
	2	Local economy such as employment and livelihood,										
	3	Land use and utilization of local resources										
	4	Social institutions such as social infrastructure and local decision-making institutions										
	5	Existing social infrastructures and services										
	6	The poor, indigenous and ethnic people										
	7	Misdistribution of benefit and damage										
	8	Cultural heritage										
	9	Local conflict of interests										
	10	Water Usage or Water Rights and Rights of Common	B		B				B		B	
	11	Sanitation										
	12	Hazards (Risk) Infectious diseases such as HIV/AIDS										
Natural Environment	13	Topography and Geographical features										
	14	Groundwater	B					B				
	15	Soil Erosion										
	16	Hydrological Situation	B					B				
	17	Coastal Zone										
	18	Flora, Fauna and Biodiversity										
	19	Meteorology										
20	Landscape	B									B	
21	Global Warming											
Pollution	22	Air Pollution										
	23	Water Pollution										
	24	Soil Contamination										
	25	Waste										
	26	Noise and Vibration	B			B		B			B	
	27	Ground Subsidence										
	28	Offensive Odor										
	29	Bottom sediment										
	30	Accidents										

Rating: A: Serious impact is expected., B: Some impact is expected., C: Extent of impact is unknown (Examination is needed. Impacts may become clear as study progresses.), No Mark: No impact is expected. IEE/EIA is not necessary.

Reference: 1) Japan International Cooperation Agency (1992) "IX Water Supply: Environmental Guidelines for Infrastructure Projects", Tokyo, Japan.

2) Norman Lee and Clive George (2002) "Environmental Assessment in Developing and Transitional Countries", JOHN WILEY & SONS, LTD., London, England.

Source : JICA Study Team

**Table H2-5 Matrix for Scoping (Groundwater Development)**

Name of Cooperation Project		The Study for Rehabilitation and Improvement of Solomon Islands Water Authority's Water Supply and Sewerage Systems																		
	No.	Likely Impacts	Overall Rating	Planning Phase		Construction Phase				Operation Phase										
				Land acquisition	Change of Land use plan, Restriction of Various Activities by constructing new facilities	Drilling	Construction of Pumping Facilities	Construction of Access Roads	Operation of Construction Equipment and Vehicles	Overdraft	Operation of Pumping Facilities, etc.	Increasing Influx of Settlers								
Social Environment: *Regarding the impacts on "Gender" and "Children's Right", might be related to all criterion of Social Environment.	1	Involuntary Resettlement																		
	2	Local economy such as employment and livelihood,																		
	3	Land use and utilization of local resources																		
	4	Social institutions such as social infrastructure and local decision-making institutions																		
	5	Existing social infrastructures and services																		
	6	The poor, indigenous and ethnic people																		
	7	Misdistribution of benefit and damage																		
	8	Cultural heritage																		
	9	Local conflict of interests																		
	10	Water Usage or Water Rights and Rights of Common	B	B																
	11	Sanitation																		
	12	Hazards (Risk) Infectious diseases such as HIV/AIDS																		
Natural Environment	13	Topography and Geographical features																		
	14	Groundwater	B																	B
	15	Soil Erosion																		
	16	Hydrological Situation	B																	B
	17	Coastal Zone																		
	18	Flora, Fauna and Biodiversity																		
	19	Meteorology																		
	20	Landscape																		
21	Global Warming																			
Pollution	22	Air Pollution																		
	23	Water Pollution																		
	24	Soil Contamination																		
	25	Waste																		
	26	Noise and Vibration	B				B	B	B	B										
	27	Ground Subsidence																		
	28	Offensive Odor																		
	29	Bottom sediment																		
	30	Accidents																		

Rating: A: Serious impact is expected., B: Some impact is expected., C: Extent of impact is unknown (Examination is needed. Impacts may become clear as study progresses.), No Mark: No impact is expected. IEE/EIA is not necessary.

Reference: 1) Japan International Cooperation Agency (1992) "IX Water Supply: Environmental Guidelines for Infrastructure Projects", Tokyo, Japan.

2) Norman Lee and Clive George (2002) "Environmental Assessment in Developing and Transitional Countries", JOHN WILEY & SONS, LTD., London, England.

Source : JICA Study Team

**Table H2-6 Matrix for Scoping (Sewerage)**

Name of Cooperation Project		The Study for Rehabilitation and Improvement of Solomon Islands Water Authority's Water Supply and Sewerage Systems								
No.	Likely Impacts	Overall Rating	Planning Phase		Construction Phase			Operation Phase		
			Land acquisition	Change of Land use plan, Restriction of Various Activities by constructing new facilities	Reclamation from Ground, etc.	Construction of Sewer pipes, Pumping stations, Sewage/ Sludge treatment plants, etc.	Operation of Construction Equipment and Vehicles	Conveyance of Sewage into facilities	Drainage	Treatment of Sewage such as Aeration, Concentration, Drying, Incineration, etc.
Social Environment *Regarding the impacts on "Gender" and "Children's Right", might be related to all criterion of Social Environment.	1	Involuntary Resettlement								
	2	Local economy such as employment and livelihood, etc.								
	3	Land use and utilization of local resources								
	4	Social institutions such as social infrastructure and local decision-making institutions								
	5	Existing social infrastructures and services								
	6	The poor, indigenous and ethnic people								
	7	Misdistribution of benefit and damage								
	8	Cultural heritage								
	9	Local conflict of interests								
	10	Water Usage or Water Rights and Rights of Common								
	11	Sanitation	B					B	B	B
	12	Hazards (Risk) Infectious diseases such as HIV/AIDS								
Natural Environment	13	Topography and Geographical features	B		B	B				
	14	Groundwater	B					B	B	
	15	Soil Erosion								
	16	Hydrological Situation								
	17	Coastal Zone	B		B	B		B	B	
	18	Flora, Fauna and Biodiversity								
	19	Meteorology								
	20	Landscape								
	21	Global Warming								
Pollution	22	Air Pollution								
	23	Water Pollution	B		C			B	B	B
	24	Soil Contamination								
	25	Waste	C		C	C	C			
	26	Noise and Vibration	B		B	B	B			
	27	Ground Subsidence								
	28	Offensive Odor	B		B		B	B	B	B
	29	Bottom sediment								
30	Accidents									

Rating: A: Serious impact is expected., B: Some impact is expected. C: Extent of impact is unknown (Examination is needed. Impacts may become clear as study progresses.), No Mark: No impact is expected. IEE/EIA is not necessary.

Reference: 1) Japan International Cooperation Agency (1992) "IX Water Supply: Environmental Guidelines for Infrastructure Projects", Tokyo, Japan.

2) Norman Lee and Clive George (2002) "Environmental Assessment in Developing and Transitional Countries", JOHN WILEY & SONS, LTD., London, England.

Source : JICA Study Team



## H2.4 Mitigation Measures for Adverse Impacts

The mitigation measures for the adverse impacts have been examined as shown in Table H2-7.

**Table H2-7 Mitigation Measures for Adverse Impacts on the Proposed Projects in Honiara**

	Item	Evaluation	Mitigation Measure	
Social Environment	1	Resettlement	D	N/A
	2	Economic Activities	D	N/A
	3	Land use and utilization of local resources	D	Drilling of boreholes will be executed and water supply facilities and sewerage facilities will be constructed in the public land within town boundary to mitigate its impact. Even if the facilities should be constructed in the private vacant land, the scale of each facility is small and therefore the impact on the land use will be negligibly small.
	4	Social institutions and local decision making	D	N/A
	5	Existing social infrastructure and services	D	N/A
	6	The poor, indigenous and ethnic people	D	N/A
	7	Misdistribution of benefit and damage	D	N/A
	8	Cultural Property	D	N/A
	9	Water rights and Rights of Common	B	New water source will be groundwater. Drilling of boreholes will be executed and the water supply facilities will be constructed in the public land within town boundary to mitigate its impact.
	10	Public health condition	D	N/A
	11	Sanitation	B	Sludge will be treated in the sludge treatment facility consisting of sludge drying bed and septic tank.
Natural Environment	12	Topography and Geology	B	Drilling of boreholes will be executed and the water supply and sewerage facilities will be constructed in the public area with the minimum required excavation work within town boundary to mitigate its impact.
	13	Groundwater	B	Impact will be mitigated by the following measures; 1) Amount of groundwater to be developed will be less than 25% of groundwater potential to keep sustainability. 2) Location of boreholes will be scattered to prevent excessive draw-down of groundwater level. 3) Boreholes will be located far enough to prevent sea-water intrusion based on analyzed result.
	14	Hydrological situation	B	Amount of groundwater to be developed will be less than 25% of groundwater recharge. It will mitigate impact on hydrological situation such as reduction in water discharge.
	15	Coastal zone	B	Existing sewage outfall structures will be upgraded and therefore contamination along the seashore by sewage discharge will be eliminated.
	16	Landscape	B	Drilling of boreholes will be executed and the water supply and sewerage facilities will be constructed in the public area along road within town boundary to mitigate its impact.
	17	Fauna and flora	D	N/A
Pollution	18	Air pollution	D	N/A
	19	Water pollution	B	Borehole construction work will be supervised properly to prevent groundwater pollution through borehole. The sewage collected by the public sewerage system will be discharged into sea by the outfall structures far from the seashore. The sludge collected from the septic tanks will be treated by the sludge treatment facility.
	20	Soil Contamination	D	N/A
	21	Noise and Vibration	B	Drilling of boreholes and the water supply and sewerage facilities will be constructed in the public area within town boundary far enough from the residential area. Therefore, the impact will be mitigated.
	22	Land subsidence	D	Groundwater will not be pumped up in alluvial plain to prevent land subsidence. Therefore, no impact is expected.
	23	Offensive odor	B	Sludge treatment facility will be constructed in the eastern part of Honiara which is far from the residential area. Therefore, the impact for offensive odor can be mitigated.
	24	Bottom Sediment	D	N/A

Note: Evaluation categories

A: Serious impact is expected, B :Some impact is expected , C : Extent of impact is unknown (Examination is needed. Impacts may become clear as study progress), D: No impact is expected. IEE/EIA is not necessary.

Source : JICA Study Team

## H2.5 Consensus with Stakeholders

### H2.5.1 Consensus on Facility Improvement Plan

In the workshops held for pilot projects, other than the discussions on the pilot projects, the facility implementation plan for the Study was explained to the stakeholders attended.

The date of workshops and stakeholders attended are shown in Table H2-8.

**Table H2-8 Workshops and Stakeholders Attended**

Workshop	Date	Stakeholders Attended
1st Workshop	Aug. 8, 2005	Representatives from; SIWA Ministry of Mines and Energy, Water Resources Division Ministry of Health & Medical Services EU AusAID JICA Bekikama Adventist College King George VI School
2nd Workshop	Nov. 25, 2005	Representatives from; SIWA Ministry of Finance Ministry of Mines and Energy, Water Resources Division Ministry of Health & Medical Services Department of Planning Department of Mines and Energy Development Services Exchange Community Sector Program JICA
3rd Workshop	Feb. 10, 2006	Representatives from; SIWA Ministry of National Planning Honiara City Council World Vision Solomon Islands AusAID SICHE King George VI School JICA Embassy of Japan

Source : JICA Study Team

Since the water supply facilities proposed in the facility improvement plan in the Study will be constructed in the public areas or in the premises of the existing stations and the scale is small, negative impact on the environmental and social considerations will not be expected.

After the explanation and discussions on the facility improvement plan, the stakeholders attended understood the above.

### H2.5.2 Consensus on Water Resources Development

Groundwater development for water supply is proposed in this Study. Negative impact by new development and relating items are summarized in Table H2-9.

**Table H2-9 Impact and Stakeholders by Groundwater Development**

Negative impact by groundwater development	Potential disaster and stakeholders		Possibility of disaster
	Disaster by the impact	Stakeholders	
Lowering of groundwater table	Lowering of ground water level of boreholes.	<ul style="list-style-type: none"> <li>– Users of dug-wells and boreholes.</li> <li>– SIWA that use big amount of the groundwater.</li> <li>– The Ministry of natural Resources that are in charge of water resources management.</li> </ul>	<ul style="list-style-type: none"> <li>– Dug-wells are not in use in Honiara.</li> <li>– There are only three private boreholes in Honiara. Impact to borehole-users is limited.</li> </ul>
Sea water intrusion	Deterioration of water quality of groundwater from boreholes due to sea water intrusion.	<ul style="list-style-type: none"> <li>– Houses and offices.</li> <li>– The Ministry of natural Resources that are in charge of environmental management.</li> </ul>	<ul style="list-style-type: none"> <li>– Land subsidence will not occur because groundwater will be developed in rock-basement area.</li> <li>– There are no buildings with pile foundation in Honiara.</li> </ul>
Land subsidence	<ul style="list-style-type: none"> <li>– High tide.</li> <li>– Damage to pile foundation of buildings.</li> <li>– Damage to under-ground pipes.</li> </ul>	<ul style="list-style-type: none"> <li>– Houses and offices.</li> <li>– The Ministry of natural Resources that are in charge of environmental management.</li> </ul>	<ul style="list-style-type: none"> <li>– Land subsidence will not occur because groundwater will be developed in rock-basement area.</li> <li>– There are no buildings with pile foundation in Honiara.</li> </ul>

Source : JICA Study Team

Stakeholders will be limited to SIWA and Ministry of Natural Resources in connection with new development of groundwater resources in Honiara as explained below.

- Honiara is rich in precipitation, and traditionally they used water-tanks to collect rain-water. Therefore, dug-wells and boreholes have not used until now.
- Private drilling of borehole is requested to be registered to SIWA and MNR. Private drilling is restricted through above legislation, and SIWA has high priority for groundwater development.
- Negative impact to residents in Honiara by new groundwater development is negligible because impact to groundwater environment is expected small as shown in Table H2-9.

Therefore, MNR and SIWA are proper stakeholders relating to new groundwater development, because MNR is in charge of water resources management and SIWA is the biggest user of water resources. The Study Team explained to MNR and SIWA about environmental impact by Mid-term water supply plan, and got full consensus from the MNR and SIWA.

### **H3 Environmental Impact of the Projects for Provincial Centers**

For the mid-term facility improvement plan for provincial centers of Noro, Auki and Tulagi, only the plan for Auki has been proposed because it is considered that the facility improvement plan for other two towns are not needed as a mid-term plan although the long-term plan is required for these towns. Therefore, the environmental impact for the provincial centers has been examined only for the proposed project in Auki.

#### **H3.1 Categorization and its Reason**

This project is categorized as B type because there are little environmental and social impacts. However, issues of water right in the customary land should be carefully taken into consideration.

#### **H3.2 Overall Environmental and Social Condition on the Project Area**

##### **(1) Population**

Table H3-1 shows the population and the number of households in Auki at present (2005) and the

target year (2010) for the facility improvement master plan in the Study.

**Table H3-1 Population and Number of Households in Auki (2005 and 2010)**

	2005	2010
Population	4,747	5,450
Household	698	801

Source: Predicted by the Study Team based on 1999 Population and Housing Census

**(2) Race**

Melanesian is dominant. However, there are also other influences through people from Micronesia (mainly Kiribati) and Polynesia, and small European and Chinese populations. Recently there was ethnic tension, which has had far-reaching consequences for Solomon Island's economy and society.

**(3) Land Use**

Developed residential area is narrow and most of the area outside of the town is arable/agricultural land or forest.

**(4) Land Ownership**

The ownership of the land is same as in Honiara. there still remains no clear boundary and unclear ownership in some areas. Some water sources and facilities of SIWA are located in the customary land. Discreet and sensitive management is requested.

**(5) Environment Protected Area**

There is no protected area in/around the project area. No endangered/valuable species is reported in the project area.

**(6) Natural Condition**

Most of the areas are situated on the gentle hills or plains. Limestone is the dominant geology in the area. Rainfall of Auki is as shown in Table H3-2.

**Table H3-2 Average Annual Rainfall for Auki**

	Honiara
Rainfall (mm)	3,153

Source: Department of Communication, Aviation and Meteorology

There are a few existing boreholes and no dug well in Auki, though there is high potential for groundwater development. No hazardous chemicals have been found in the ground water.

**H3.3 Adverse Environmental and Social Impacts**

For environmental and social consideration, proposed project for Auki has been evaluated by the check list as shown

Table H3-3. The proposed project consists of the following component.

**(1) Water supply system improvement project**

In Auki, project for rehabilitating water intake dam, and constructing water transmission mains and reservoir funded by Asian Development Bank (ADB) is under way and will be completed within the year 2006. After completion of the ADB project, the water supply facilities will be able to serve for the demand of the target year 2010 except the water source capacity. As the new water source, two (2) boreholes will have to be developed in the premises of Low Level Tank.

**(2) Sewerage system improvement project**

Since there is no existing sewerage system in Auki, sewerage system improvement project is not proposed.

**(3) Evaluation results**

The proposed project has two aspects, that is, improvement of water supply system and development of ground water. Therefore, each component is also evaluated by the matrix for scoping as shown in the following tables.

**Table H3-3 Check List for Scoping (Auki)**

Item		Evaluation	Reason	
Social Environment	1	Resettlement	D	Most of the new facilities will be constructed under public roads and inside public lands. Therefore, resettlement will not occur.
	2	Economic Activities	D	No impact on local economic activities is expected.
	3	Land use and utilization of local resources	D	Drilling of boreholes will be executed and water supply facilities will be constructed in the public land within town boundary. Therefore, no impact is expected.
	4	Social institutions and local decision making	D	No impact is expected.
	5	Existing social infrastructure and services	D	No impact is expected.
	6	The poor, indigenous and ethnic people	D	No impact is expected.
	7	Misdistribution of benefit and damage	D	No impact is expected.
	8	Cultural Property	D	No impact is expected.
	9	Water rights and Rights of Common	B	There remain some issues on the water rights and rights of common in the customary land, even after the legal resolution between the government and the land owners. Careful dealing is requested.
	10	Public health condition	D	The public health condition will be improved by the project.
	11	Sanitation	D	No impact.
Natural Environment	12	Topography and Geology	B	During construction of new well facilities, topography and geographical features may be slightly affected.
	13	Groundwater	B	Development of groundwater may cause some impact. It is necessary to formulate the appropriate plan in order to avoid the serious impact.
	14	Hydrological situation	B	Development of water resources may cause some impact on hydrological situation. It is necessary to formulate the appropriate plan in order to avoid the serious impact.
	15	Coastal zone	D	No impact.
	16	Landscape	B	Construction of facilities may cause small change of landscape.
	17	Fauna and flora	D	No impact. No record of valuable species. Scale of facilities is small.
Pollution	18	Air pollution	D	No impact.
	19	Water pollution	D	No impact.
	20	Soil Contamination	D	No impact.
	21	Noise and Vibration	B	Pumping and generator may cause noise and vibration. However the impact will be small because the scale of pump facilities is small.
	22	Land subsidence	D	No impact.
	23	Offensive odor	D	No impact.
	24	Bottom Sediment	D	No impact.

Note: Evaluation categories

A: Serious impact is expected, B :Some impact is expected , C : Extent of impact is unknown (Examination is needed. Impacts may become clear as study progress), D: No impact is expected. IEE/EIA is not necessary.

Source : JICA Study Team

**Table H3-4 Matrix for Scoping (Water Supply)**

Name of Cooperation Project		The Study for Rehabilitation and Improvement of Solomon Islands Water Authority's Water Supply and Sewerage Systems										
	No.	Likely Impacts	Overall Rating	Planning Phase		Construction Phase			Operation Phase			
				Land acquisition	Change of land use plan, restriction of various activities by constructing new facilities	Construction of well facilities and water supply facilities	Construction of filtration facilities	Operation of construction equipment and vehicles	In taking excessive water from rivers, lakes, etc.	Drainage	Operation of related facilities	Appearance/ Occupancy of related building structures
Social Environment: *Regarding the impacts on "Gender" and "Children's Right", might be related to all criterion of Social Environment.	1	Involuntary Resettlement										
	2	Local economy such as employment and livelihood,										
	3	Land use and utilization of local resources										
	4	Social institutions such as social infrastructure and local decision-making institutions										
	5	Existing social infrastructures and services										
	6	The poor, indigenous and ethnic people										
	7	Misdistribution of benefit and damage										
	8	Cultural heritage										
	9	Local conflict of interests										
	10	Water Usage or Water Rights and Rights of Common	B		B					B		B
	11	Sanitation										
	12	Hazards (Risk) Infectious diseases such as HIV/AIDS										
Natural Environment	13	Topography and Geographical features										
	14	Groundwater	B							B		
	15	Soil Erosion										
	16	Hydrological Situation	B							B		
	17	Coastal Zone										
	18	Flora, Fauna and Biodiversity										
	19	Meteorology										
	20	Landscape	B									B
Pollution	22	Air Pollution										
	23	Water Pollution										
	24	Soil Contamination										
	25	Waste										
	26	Noise and Vibration	B			B			B			B
	27	Ground Subsidence										
	28	Offensive Odor										
	29	Bottom sediment										
	30	Accidents										

Rating: A: Serious impact is expected., B: Some impact is expected., C: Extent of impact is unknown (Examination is needed. Impacts may become clear as study progresses.), No Mark: No impact is expected. IEE/EIA is not necessary.

Reference: 1) Japan International Cooperation Agency (1992) "IX Water Supply: Environmental Guidelines for Infrastructure Projects", Tokyo, Japan.

2) Norman Lee and Clive George (2002) "Environmental Assessment in Developing and Transitional Countries", JOHN WILEY & SONS, LTD., London, England.

Source : JICA Study Team

**Table H3-5 Matrix for Scoping (Groundwater Development)**

Name of Cooperation Project		The Study for Rehabilitation and Improvement of Solomon Islands Water Authority's Water Supply and Sewerage Systems											
	No.	Likely Impacts	Overall Rating	Planning Phase		Construction Phase				Operation Phase			
				Land acquisition	Change of Land use plan, Restriction of Various Activities by constructing new facilities	Drilling	Construction of Pumping Facilities	Construction of Access Roads	Operation of Construction Equipment and Vehicles	Overdraft	Operation of Pumping Facilities, etc.	Increasing Influx of Settlers	
Social Environment: *Regarding the impacts on "Gender" and "Children's Right", might be related to all criterion of Social Environment.	1	Involuntary Resettlement											
	2	Local economy such as employment and livelihood,											
	3	Land use and utilization of local resources											
	4	Social institutions such as social infrastructure and local decision-making institutions											
	5	Existing social infrastructures and services											
	6	The poor, indigenous and ethnic people											
	7	Misdistribution of benefit and damage											
	8	Cultural heritage											
	9	Local conflict of interests											
	10	Water Usage or Water Rights and Rights of Common											
	11	Sanitation											
	12	Hazards (Risk) Infectious diseases such as HIV/AIDS											
Natural Environment	13	Topography and Geographical features											
	14	Groundwater	B									B	
	15	Soil Erosion											
	16	Hydrological Situation	B									B	
	17	Coastal Zone											
	18	Flora, Fauna and Biodiversity											
	19	Meteorology											
Pollution	20	Landscape											
	21	Global Warming											
	22	Air Pollution											
	23	Water Pollution											
	24	Soil Contamination											
	25	Waste											
	26	Noise and Vibration	B			B	B	B	B				
	27	Ground Subsidence											
	28	Offensive Odor											
	29	Bottom sediment											
30	Accidents												

Rating: A: Serious impact is expected., B: Some impact is expected., C: Extent of impact is unknown (Examination is needed. Impacts may become clear as study progresses.), No Mark: No impact is expected. IEE/EIA is not necessary.

Reference: 1) Japan International Cooperation Agency (1992) "IX Water Supply: Environmental Guidelines for Infrastructure Projects", Tokyo, Japan.

2) Norman Lee and Clive George (2002) "Environmental Assessment in Developing and Transitional Countries", JOHN WILEY & SONS, LTD., London, England.

Source : JICA Study Team

### H3.4 Mitigation Measures for Adverse Impacts

The mitigation measures for the adverse impacts have been examined as shown in Table H3-6.

**Table H3-6 Mitigation Measures for Adverse Impacts on the Proposed Projects in Auki**

Item		Evaluation	Mitigation Measure	
Social Environment	1	Resettlement	D	N/A
	2	Economic Activities	D	N/A
	3	Land use and utilization of local resources	D	N/A
	4	Social institutions and local decision making	D	N/A
	5	Existing social infrastructure and services	D	N/A
	6	The poor, indigenous and ethnic people	D	N/A
	7	Misdistribution of benefit and damage	D	N/A
	8	Cultural Property	D	N/A
	9	Water rights and Rights of Common	B	New water source will be groundwater. Drilling of boreholes will be executed in SIWA site and the water supply facilities will be constructed in the public land within town boundary to mitigate its impact.
	10	Public health condition	D	N/A
	11	Sanitation	D	N/A
Natural Environment	12	Topography and Geology	B	Drilling of boreholes will be executed in SIWA site and the water supply facilities will be constructed in the public area with the minimum required excavation work within town boundary to mitigate its impact.
	13	Groundwater	B	Impact will be mitigated by the following measures; 1) Amount of groundwater to be developed is much less than groundwater potential to keep sustainability. 2) Only two boreholes will be drilled, which is expected no excessive draw-down of groundwater level. 3) Boreholes will be located far enough to prevent sea-water intrusion based on analyzed result.
	14	Hydrological situation	B	Amount of groundwater to be developed is much less than groundwater recharge. Therefore, it will mitigate impact on hydrological situation such as reduction in water discharge.
	15	Coastal zone	D	N/A
	16	Landscape	B	Drilling of boreholes will be executed in SIWA site and the water supply facilities will be constructed in the public area along road within town boundary to mitigate its impact.
	17	Fauna and flora	D	N/A
Pollution	18	Air pollution	D	N/A
	19	Water pollution	D	N/A
	20	Soil Contamination	D	N/A
	21	Noise and Vibration	B	Drilling of boreholes and the water supply facilities will be constructed in the public area within town boundary far enough from the residential area. Therefore, the impact will be mitigated.
	22	Land subsidence	D	N/A
	23	Offensive odor	D	N/A
	24	Bottom Sediment	D	N/A

Note: Evaluation categories

A: Serious impact is expected, B :Some impact is expected , C : Extent of impact is unknown (Examination is needed. Impacts may become clear as study progress), D: No impact is expected. IEE/EIA is not necessary.

Source : JICA Study Team



### **H3.5 Consensus with Stakeholders**

For the facility improvement plan in the Study for provincial centers, the development of water sources in Auki is proposed only. Water supply facilities in other provincial centers are considered as operational up to at least 2010.

The development of water sources in Auki includes construction of two (2) boreholes in the premises of the existing transmission pump station and Low Level Tank site. Therefore, negative impact on the natural and social environment will not be expected.

# **PART I**

## **URGENT REHABILITATION PLAN**

## **PART I URGENT REHABILITATION PLAN**

This part describes restoration/rehabilitation urgently required for existing water supply systems/facilities.

### **II Urgent Rehabilitation Plan for Honiara**

Water supply systems/facilities in Honiara have various damage that requires rehabilitation. Most of this damage is within the capacity of SIWA's technical maintenance capability. However, the facilities constructed in 1998 through Japan's Grant Aid project called "the Project for Improvement of the Water Supply System in Honiara" were damaged seriously due to ethnic tension from 2000 to 2003 and some parts of the facilities have not been operable since then. The facilities in question are a target for the urgent rehabilitation.

Since the targeted facilities were constructed through Japan's Grant Aid, SIWA requested supplemental assistance in the form of follow-up cooperation (hereinafter referred to as "F/U") to the Japanese Government for rehabilitation of the facilities. Subsequently, the Study Team investigated the facilities' conditions in view of the appropriateness as F/U.

Following a series of studies, the following are confirmed:

- Rehabilitation is urgently required.
- The main equipment supply must be covered by F/U.
- Equipment installation can be covered by SIWA.

The following clauses describe the examination of feasibility for F/U and the plan and execution to rehabilitate the targeted facilities through F/U.

#### **II.1 Condition before Rehabilitation and Rehabilitation Plan**

##### **II.1.1 Target Facilities for Rehabilitation Plan**

The original project is "the Project for Improvement of Water Supply System in Honiara". The facilities construction was completed in March 1998. Targeted facilities for the rehabilitation plan are limited to those constructed under the original project, as shown in Table II.1-1. (The targeted facilities are hereinafter referred to as "the original facilities".)

**Table I1.1-1 Original Facilities to be examined for Restoration/Rehabilitation**

Location/System	Facility		Remark
White River JICA Bores System	Water Source (4 boreholes)	Borehole Facility	4 bores from W-1 to W-4
		Submersible Pump Facility	4 bores from W-1 to W-4
		Submersible Pump Control Facility	4 bores from W-1 to W-4
		Fence	4 bores from W-1 to W-4
		Electric Power Receiving/distributing Facility	4 bores from W-1 to W-4
	Water Conveyance	Water Conveyance Pipeline	
	Water Receiving	Water Receiving Tank	
	Water Transmission	Water Transmission Pump Facility	3 sets of pump
		Water Transmission Main	
	Water Distribution	JICA White River Tank	
		Water Distribution Pipeline	
	Disinfection	Chlorination Facility	
Building	Water Transmission Pump Room, Chlorinating Room		
Mataniko JICA Bores System	Water Source (5 boreholes)	Borehole Facility	5 bores from M-1 to M-5
		Submersible Pump Facility	5 bores from M-1 to M-5
		Submersible Pump Control Facility	5 bores from M-1 to M-5
		Fence	5 bores from M-1 to M-5
		Electric Power Receiving/distributing Facility	5 bores from M-1 to M-5
	Water Conveyance	Water Conveyance Pipeline	
	Water Receiving	Water Receiving Tank	
	Water Transmission	Water Transmission Pump Facility	3 sets of pump
		Water Transmission Main	
	Water Distribution	JICA Skyline Tank	
		Water Distribution Pipeline	
	Disinfection	Chlorination Facility	
Building	Water Transmission Pump Room, Chlorinating Room		
Kombito JICA Bores System	Water Source (2 boreholes)	Borehole Facility	2 bores from K-1 and K-2
		Submersible Pump Facility	2 bores from K-1 and K-2
		Submersible Pump Control Facility	2 bores from K-1 and K-2
		Fence	2 bores from K-1 and K-2
		Electric Power Receiving/distributing Facility	2 bores from K-1 and K-2
	Water Conveyance	Water Conveyance Pipeline	
	Water Receiving	Water Receiving Tank	
	Water Transmission	Water Transmission Main	
	Water Distribution	JICA Panatina Tank	
		Water Distribution Pipeline	
	Disinfection	Chlorination Facility	
	Building	Chlorinating Room	

Source : SIWA

### 11.1.2 Present Conditions of the Original Facilities

The present conditions of the original facilities are summarized by system as shown in Table I1.1-2 and the details by facilities are shown in S-8 of the Supporting Report.

**Table II.1-2 Present Conditions of Original Facilities by System**

System	Actual Condition	Causes of Damage/Trouble
White River JICA Bores System	Submersible Pump and Water Transmission Facilities are broken/removed and /or inoperative and all the facilities of system are not in use.	Electric power cable went dead in around 1999. Since then, all the facilities have not been working. Later, in the ethnic tension, some electric devices etc. were destroyed.
Mataniko JICA Bores System	System has been generally working except M-4 bore hole facility. Operation of M-4 has been suspended due to low groundwater level.  Until the present time, some mechanical troubles happened. SIWA repaired those troubles by transferring the equipment/parts from White River JICA Bores System.	Groundwater level of M-4 has been low since the commencement of operation.
	For JICA Skyline Tank, there is water leakage through bolt holes, so that the tank is not in use.	Approx. 20 bolts were taken out at JICA Skyline Tank. They say that neighboring residents took the bolts. Putting new bolts is not difficult to be done by SIWA.
	As riser pipe of submersible pump is made with galvanized steel, the pipe is easily corroded.	Tendency to corrosion of riser pipe is caused by water temperature.
Kombito JICA Bores System	Although submersible pump facilities were destroyed by the ethnic tension, SIWA restored it by self-effort in December 2004.	Submersible pumps and electrical panels were destroyed under the ethnic tension.
	The water receiving tank is damaged and not in use. SIWA has currently no plan to re-use the tank as they changed the water transmission route and water supply area.	Water receiving tank was damaged by neighboring resident before the ethnic tension.
	As riser pipe of submersible pump is made with galvanized steel, the pipe is easily corroded.	Tendency to corrosion of riser pipe is caused by water temperature.

Source : SIWA

### **II.1.3 Present Capacity as Water Source**

The capacity of bores was confirmed by pumping test in this Study. The outline of the pumping test is as follows:

- Eleven bores were drilled under Japan's grant aid project in 1997. A pumping test was carried out for six out of eleven bores, the capacity of which is considered lower than the original state.
- Bore washing was carried out to restore the capacity for bores showing a lower capacity in the pumping test.

The results of the pumping test were shown in S-8 of the Supporting Report with the results of the original pumping test under the Japanese grant aid project.

**Table II.1-3 Pumping Test and Bore Washing**

System	Bore Name	Planned yield (m <sup>3</sup> /day)	Results of Pumping Test		Actual Bore Capacity	
			Lowering of bore capacity compared with original state <sup>1)</sup>	Bore washing	Safe Yield	Note
White River JICA Bores System	W-1	880	51% lowered	18-hours washing	Planned yield is possible	Sand drained from bore is 1.6g/m <sup>3</sup> during pumping test. Yield of less than 880m <sup>3</sup> /day will produce less sand.
	W-2	880	14% lowered	6-hours washing	Planned yield is possible	—
	W-4	880	Not lowered	No washing	Planned yield is possible	—
Mataniko JICA Bores System	M-4	860	56% lowered	6-hours washing	Planned yield is impossible. But yield of less than 100m <sup>3</sup> /day is possible.	Safe yield of M-4 was originally 150m <sup>3</sup> /day. Capacity of M-4 is lower than the other bores in the site. Pumping efficiency of M-4 is much less than the other bores.
Kombito JICA Bores System	K-1	800	Not lowered	No washing	Planned yield is possible	—
	K-2	800	16% lowered	6-hours washing	Planned yield is possible	—

Note-1) Bore capacity was estimated as shown below:

Lowered capacity of bore (%)= (Original specific yield of bore – Current specific yield of bore) ÷ Original specific yield of bore × 100. Where, specific yield of bore=Yield(m<sup>3</sup>/day) ÷ Draw-down(m).

Source : JICA Study Team

The result of the bore pumping test is summarized as follows;

- Most bores, except for M-4, have enough capacity for the water source.
- Some bores have the same capacity as the original capacity, and others have comparatively less capacity. This is caused by clogging of materials forming an aquifer near the screen of the bores.

Bore washing was carried out with compressed air for four bores that showed less bore capacity and was continued for 6 to 18 hours. It seems that bore washing contributed to recovering the bore capacity to some extent, though its capacity did not completely recover to the original state.

#### **II.1.4 Required Works for Rehabilitation**

The necessary works for the Urgent Rehabilitation are summarized as follows:

- Restoration of the White River JICA Bores System
- Replacement of a riser pipe for the Mataniko and Kombito JICA Bores Systems

##### **(1) White River JICA Bores System**

As described before, the capacity of 4 bores is as shown in Table II.1-4.

**Table II.1-4 Present Capacity of White River Bore**

Bore Number	Present Capacity	Remark
W-1	880 m <sup>3</sup> /day	Same as the original design capacity.
W-2	880 m <sup>3</sup> /day	Same as the original design capacity.
W-3	880 m <sup>3</sup> /day	Same as the original design capacity.
W-4	880 m <sup>3</sup> /day	Same as the original design capacity.

Source : JICA Study Team

The total capacity of 3,500 m<sup>3</sup>/day is approximately 30% of the present capacity of Konglai Spring that is the main water source for Honiara, and able to cover the required quantity for Point Cruz Zone that is the center of Honiara. Since the system is completely different from the systems of Konglai Spring and Rove Spring, 4 bores can supply water to the center of Honiara in case of unexpected spring blockages or troubles. Therefore, the restoration of the damaged White River JICA Bores System is valuable and necessary for a stable water supply for Honiara.

Since systems such as pumps and water transmission facilities have been destroyed, the restoration requires system reconstruction as well as equipment replacement. The necessary system restorations are as follows:

- Restoration of pumping system for bores
- Restoration of water transmission system to JICA White River Tank
- Restoration of disinfection system
- Restoration of electric receiving/distributing system

**(a) Restoration of pumping system for bores**

The submersible pumps were removed and there is no pump at present. Some of the control panels have been destroyed while the others are out of order. The pumping up system of groundwater must be reconstructed. Procurement and installation of the following equipment is necessary to restore the original function:

- 4 sets of submersible pump
- 4 sets of riser pipe
- 4 sets of connecting pipes to water conveyance pipeline, including meters and valves
- A high water level switch to be set at bores
- Control panels for 4 submersible pumps

**(b) Restoration of water transmission system to JICA White River Tank**

One (1) transmission pump system set was reassembled temporarily by SIWA. However, there is considerable corrosion on the equipment and the stability and safety of the system are too poor to utilize it as a permanent system. Procurement and installation of the following equipment is necessary for restoration of the original function:

- 3 sets of water transmission pump
- 3 sets of pump header pipes, including meters and valves
- A high water level switch to be set at the water receiving tank and JICA White River Tank for the control of pumps
- Control panels for 3 water transmission pumps

**(c) Restoration of disinfection system**

Although SIWA installed 1 set of a disinfection system as a temporary substitution at the end of 2004,

the stability and safety of the system are too poor to utilize as a permanent system. Procurement and installation of the following equipment is necessary for restoration of the original function;

- 1 set of agitate tank
- 1 set of mixer
- 2 sets of dozing pump and necessary piping
- Control panels for the disinfection system

**(d) Restoration of the electric receiving/distributing system**

Electric power distributing panels were destroyed and are inoperative. Electric power cables were also damaged and are unreliable for practical use. Procurement and installation of the following equipment is necessary for restoration of the original function;

- 1 set of power distribution panels
- 1 set of power cables with necessary accessories

**(2) Mataniko JICA Bores System**

As described before, the capacity of 4 working bores are in good condition and it is recommended to stop the operation of 1 bore, "M-4", due to low water levels. Therefore, there is no restoration subject for water source capacity in this system.

Repair of the JICA Skyline Tank is necessary. However, SIWA has an idea of rehabilitation of the Skyline water reserving system, which includes reconstruction of the SIWA Skyline Tank and improvement of the total storage capacity using the same. Therefore, repair is recommended to manage the mentioned rehabilitation.

Countermeasures against corrosion of the riser pipe should urgently be taken to avoid any accidents, such as a pump falling down in the borehole of the submersible pump. The following work is necessary as a countermeasure:

- Replacement of riser pipe

**(3) Kombito JICA Bores System**

SIWA restored the system at the end of 2004. Since then, the system supplies water to different areas from the original design. In the original design, the water was intended to be transmitted to the JICA Panatina Tank through the receiving tank. However, SIWA modified the system and transfers water to the EU Tank at present. Under the current system, the receiving tank cannot be utilized; hence repair of the damaged receiving tank is not urgent.

Countermeasures to avoid corrosion of the riser pipe are urgently required. The following work is necessary, as a countermeasure in the Mataniko System;

- Replacement of the riser pipe

**(4) Necessary Improvement from the Original Design during Rehabilitation**

The following items must be improved during the restoration when equipment is replaced:

- To put submersible pump control panels in the water transmission pump room, in order to avoid destruction by human acts.
- To install riser pipes made of non-corrosive resistant material, in order to protect them from pipe corrosion.
- To install the electricity power cables for submersible pumps with a overhead wiring system, in



order to facilitate inspection and repair.

### **11.1.5 Justification of Rehabilitation**

The above required works are justified as described below:

#### **(1) Restoration of White River JICA Bores System**

##### **(a) Urgency**

Drinking water is indispensable to assuring human life. Kongulai Spring, as the main water source for Honiara, has often been blocked due to natural disasters or vandalism. With these facts taken into consideration, preparation of a reserved water source is urgently required against blockage. Therefore, urgent restoration is necessary for the White River JICA Bores System.

##### **(b) Sustainability on Operation and Maintenance**

The mentioned White River JICA Bores System requires operations of submersible and water transmission pumps; hence electricity consumption will be higher if operated regularly. However, the White River JICA Bores System is categorized as a reserved water source and not operated regularly. Therefore, no electricity charge is expected for the regular water supply in Honiara.

Since the system has sustained serious and large scale damage, the SIWA has been unable to restore under its own efforts. Since SIWA has the capacity for regular maintenance and small scale repair however, there is no significant problem in terms of operation and maintenance after restoration.

##### **(c) Technical Viability**

Since it is confirmed for the capacity of 4 bores that water pumping is allowed at the original design level, the system restoration is viable in capacity.

The equipment installation works can be done by SIWA. SIWA's engineering skill is proved by the restoration work for Kombito JICA Bores System, which was done by SIWA. The restoration of the White River JICA Bores System is viable in technique.

##### **(d) Clearance of Water Right and Access to Site**

Among the related sites to White River JICA Bores System, bore sites of W-1, W-2 and W-4 are located in customary land. As for W-1 and W-2, a land lease contract is effective between the Government of Solomon Islands and the land owner. However, the contract for W-4 is actually terminated and renewal of the contract is required. Therefore, SIWA and the Government of the Solomon Islands shall take the necessary measures to extend the contract before the restoration work. SIWA has started the necessary procedures to extend the land lease contract for W-4.

#### **(2) Replacement of riser pipe for Mataniko and Kombito JICA Bores Systems**

##### **(a) Urgency**

The corrosion of riser pipe developed faster than expected in the original design. An accident, whereby the submersible pump fell down due to corrosion of the riser pipe, happened in July 2004 and March 2005 at bores other than JICA bores. Such accidents resulted in extended disruption to supply. As the existing riser pipes have a significant risk of such an accident, countermeasures are urgently required. To avoid such accidents, replacement of the riser pipe with corrosion-resistant material is required for all bores in Honiara.

##### **(b) Sustainability on Operation and Maintenance**

The pipe, which is made of corrosion-resistant material, contributes to the ease of maintenance.

**(c) Technical Viability**

Since the replacement work can be covered by SIWA, both technically and financially, there is no significant problem.

**(d) Clearance of Water Right and Access to Site**

There is no remarkable problem.

**11.1.6 Priority for Rehabilitation by Follow-up Cooperation**

SIWA's priority for F/U on the rehabilitation was noticed by the Minutes of Discussion signed on June 27, 2005. (Refer to S-8 of Supporting Report)

Taking the SIWA's priority and the following evaluation into consideration, the priority for restoration/rehabilitation utilizing F/U was set as Table 11.1-5.

- Priority in view of the water supply system
- Priority in view of the facility function in a system
- Priority in view of SIWA's technical and financial difficulties
- Priority in view of the objectives of the F/U scheme and equipment to be procured

**Table 11.1-5 Priority for Rehabilitation by Follow-up Cooperation**

System	Facility	Content	System	Facility Function	Technical/Financial	Objectives	SIWA's Priority	Evaluated Priority of F/U
White River JICA Bores System	Water Source	Procure Major Equipment	A	-	A	A	A	<b>A</b>
		Installation	A	-	X	-	X	<b>X</b>
		Procure Spare Parts	A	-	C	X	C	<b>X</b>
	Water Transmission	Procure Major Equipment	A	-	A	A	A	<b>A</b>
		Installation	A	-	X	-	X	<b>X</b>
		Procure Spare Parts	A	-	C	X	C	<b>X</b>
	Disinfection	Procure Major Equipment	A	-	A	A	A	<b>A</b>
		Installation	A	-	X	-	X	<b>X</b>
		Procure Spare Parts	A	-	C	X	C	<b>X</b>
Mataniko JICA Bores System	Water Source	Procure Spare Parts	B	-	C	X	C	<b>X</b>
		Procure Riser Pipe	B	-	A	B	B	<b>B</b>
Kombito JICA Bores System	Water Source	Procure Spare Parts	B	-	C	X	C	<b>X</b>
		Procure Riser Pipe	B	-	A	B	B	<b>B</b>

Remark A: High priority, B: Mid priority, C: Low priority, X: To be done by SIWA  
Source : JICA Study Team

**(1) Priority in view of Water Supply System**

The White River JICA Bores System is now inoperative. Mataniko and Kombito JICA Bores Systems are working as a system. Therefore the restoration of the White River JICA Bores System is a higher priority than the Mataniko and Kombito JICA Bores Systems.

**(2) Priority in view of the Facility Function in a System**

As for the White River JICA Bores System, any of the facilities and equipment are necessary to restore the system. Therefore there is no priority ranking between the facilities and items of equipment.

As for Mataniko and Kombito JICA Bores Systems, the subject is only for the water source (bore hole) facility. Therefore no priority can be put between facilities.

**(3) Priority in view of the Technical and Financial Difficulties facing SIWA**

The rehabilitation consists of three main components. Those are 1) The Procurement of Major Equipment, 2) Installation of the Equipment and 3) Procurement of Spare Parts. Among these three components, “2) Installation of the Equipment” will be borne by SIWA, so this component does not require F/U. Moreover, the priority of “3) Procurement of Spare Parts” is low since it need not be procured in bulk and SIWA can procure parts by parts according to the urgency. The priority of “1) Procurement of Major Equipment”, which requires a significant amount of budget, is higher than the others.

**(4) Priority in view of Objectives of F/U Scheme and Equipment to be Procured**

The objectives of F/U should generally be restoration of the original facilities/functions. Since the major equipment for White River JICA Bores System is to be utilized in the system restoration, the priority of “Procurement of Major Equipment” is higher. “Procurement of Spare Parts” is inappropriate for F/U, as it targets the future maintenance and repair of the equipment. “Procurement of a riser pipe” for Mataniko and Kombito JICA Bores Systems is lower in priority, since the system is operative.

## **11.2 Execution of Rehabilitation Works**

After the examination of the study results, as described in the previous clause, JICA decided to assist SIWA for the following rehabilitations in the procurement of necessary major equipment through F/U (Mentioned major equipment and its specifications are as shown in S-X of Supporting Report);

**(1) Restoration of White River JICA Bores System**

- Restoration of pumping system for bores

For 4 bores, those are W-1, 2, 3 and 4, including the pipe arrangement and control system. The pumping capacity and facility function are the same as the original project.

- Restoration of water transmission system to the JICA White River Tank

For 3 sets of the water transmission pump. The pumping capacity and facility function are the same as the original project.

- Restoration of the disinfection system

For the disinfection system to be set beside the water transmission pumps. The capacity and facility function are the same as the original project.

- Restoration of electric receiving/distributing system

Electricity distribution panels and cables for submersible and water transmission pumps.

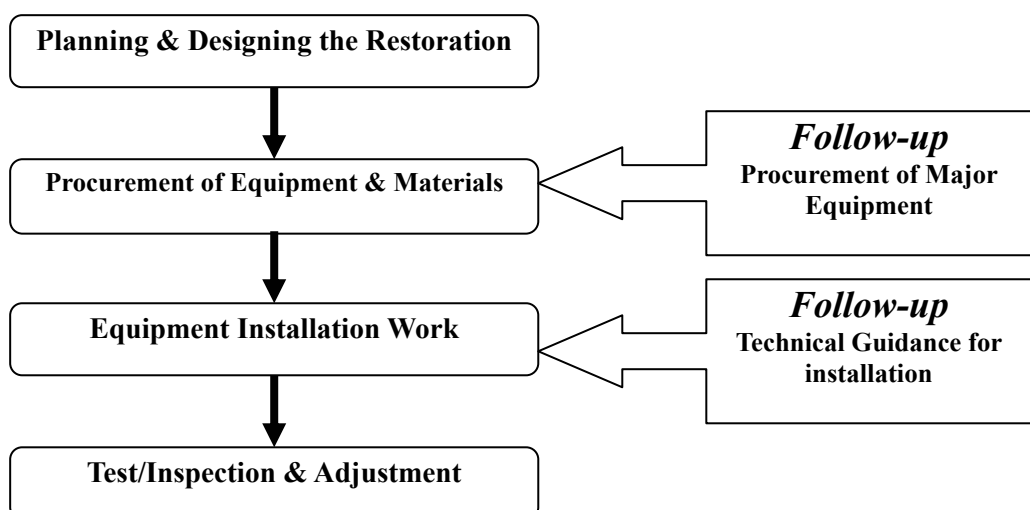
**(2) Replacement of the Riser Pipe for Mataniko and Kombito JICA Bores Systems**

- Replacement of the riser pipe

For 6 bores, those are M-1, 2, 3 and 5 and K-1 and 2.

### **11.2.1 Position of Follow-up Cooperation in Rehabilitation**

F/U is positioned as shown in Figure 11.2-1 in the rehabilitation flow. The works not covered by F/U are under the scope of SIWA.



Source : JICA Study Team

**Figure I1.2-1 Position of Follow-up Cooperation**

Although F/U covers equipment delivery to the installation site, inspection of the procured goods and instruction to the supplier for delivery details are under the scope of SIWA.

### I1.2.2 Equipment Supplier for Follow-up Cooperation

The following local supplier was selected through competitive quotations by JICA on December 29, 2005 for the equipment procurement. The Study Team assisted JICA in confirming the appropriateness of the offered equipment and price. The contract amount with the supplier is Aus\$374,622.00- (US\$284,525.41-).

Company: Island Enterprises Limited  
 Mail Address: PO Box 364, Honiara, Solomon Islands  
 Telephone: 30152  
 Facsimile: 30188

### I1.2.3 Schedule of Follow-up Cooperation

Schedule of F/U is planned as shown in Table I1.2-1.

**Table I1.2-1 Schedule of Follow-up Cooperation**

No.	Activity	Date/Period
1.	Equipment Procurement Contract with the supplier	December 29, 2005
2.	Equipment Procurement by the supplier	From December 29, 2005 to the beginning of March, 2006
3.	Pre-Delivery Inspection by SIWA	From the beginning to the middle of March, 2006
4.	Equipment Delivery to installation sites	From the middle of March to middle of April, 2006, item by item according to SIWA's final delivery order
5.	Technical Guidance	During SIWA's installation and inspection works

Source : JICA Study Team

### I1.2.4 Preparation for Rehabilitation

The Study Team assisted SIWA and SIWA prepared a plan and schedule for the rehabilitation and

inspection. This clause describes the prepared plan and schedule.

**(1) Schedule**

The planned schedule is as shown in Figure I1.2-2.

Work Items	Responsible	February 2006				March 2006				April 2006				May 2006				
1. F/U Equipment Arrival at Honiara																		
1-1 Ship arrival, unloading and custom clearance	Supplier																	
1-2 Pre-Delivery Inspection and issue of Certificate	SIWA																	
1-3 Temporally Storage	Supplier																	
2. Restoration of White River Facilities																		
2-1 Restoration of Well Facilities																		
2-1-1 W-1	SIWA																	
2-1-2 W-2	SIWA																	
2-1-3 W-3	SIWA																	
2-1-4 W-4	SIWA																	
2-2 Restoration of Electric Power Cable																		
2-2-1 Preparation for contracting	SIWA																	
2-2-2 For W-1 and W-2	SIWA (Contractor)																	
2-2-3 For W-3 and W-4	SIWA (Contractor)																	
2-3 Water Transmission Pump Facilities	SIWA																	
2-4 Control Line for JICA White River Tank	SIWA (Contractor)																	
2-5 Final Adjustment	SIWA																	
2-6 Fence	SIWA																	
3. Rehabilitation of Mataniko/Kombito Facilities																		
3-1 Riser Pipe Replacement in Mataniko and Kombito	SIWA																	
4. Technical Guidance	Supplier																	
5. Final Inspection and issue of Certificate	SIWA																	

Source : JICA Study Team

**Figure I1.2-2 Rehabilitation Schedule**

**(2) Plan for Rehabilitation and Inspection**

**(a) Ship arrival, unloading and customs clearance**

The equipment will be transported to Honiara by ships under the responsibility of the Supplier. Required works for unloading and customs clearance will be also done under the responsibility of the Supplier.

**(b) Pre-delivery inspection and issue of certificate**

SIWA will form the inspection team headed by the Manager of the Engineering Service Department. Upon Supplier's notice that the procured equipment is ready to be delivered after custom clearance, the inspection team will conduct inspections for the following items in accordance with the Contract between JICA and the Supplier and other official documents submitted by the Supplier and approved by JICA.

- To check the country of origin, manufacturer and model by item.
- To check the quantity of each item.
- To make visual inspections for workmanship and/or damage

When the inspection team confirms the arrival of all the F/U Equipment, SIWA will issue the "Certificate of Pre-Delivery Inspection" to JICA and the Supplier. The certificate should be issued, even if some damage is found on the F/U Equipment.

If some damage is found on the equipment, SIWA will claim compensation from the Supplier and inform JICA of the fact.

**(c) Temporary storage**

The Supplier will store the E/U Equipment in its stores until the final delivery order is issued by SIWA. SIWA should order final delivery of the F/U Equipment by item in accordance with the progress of the installation work. The Supplier is responsible for the final delivery to installation sites. The period of this temporary storage is for 3 months from the date of "Certificate of Pre-Delivery Inspection". Therefore SIWA should start the installation work and make final delivery orders within 3 months.

If SIWA does not order the final delivery within 3 months, the F/U Equipment would be delivered to SIWA's store by the Supplier.

**(d) General scope of SIWA for rehabilitation site work**

The restoration/rehabilitation will be managed and executed by SIWA, utilizing F/U Equipment. Materials required for installation and uncovered by F/U should be procured by SIWA.

The Supplier will send an engineer to installation sites for technical guidance to instruct on the proper installation and usage of the F/U Equipment. During installation, SIWA shall follow the instructions and respect the warranty conditions of the Supplier.

**(e) Rehabilitation of White River facilities**

Restoration of Borehole and Water Transmission Pump Facilities

All of the existing equipment should be removed and new equipment should be installed instead. A crane truck should be utilized to remove and erect the equipment.

The submersible Pump Local Control Panels will be the indoor type, so they should be installed in the Water Transmission Pump House.

Restoration of Electric Power Cable and Control Line for JICA White River

SIWA will entrust the overhead cabling for the Electric Power Cable and Control Line for the JICA White River to an electric company (the Contractor) by SIWA's maintenance budget. The Contractor should utilize F/U Equipment. The necessary cables and electric poles (at approximately 45m intervals) are included in the F/U Equipment.

SIWA will start entrusting preparation one month prior to the cabling work. To keep appropriate access to the well locations, SIWA should start the restoration works of Electric Power Cable after restoration of well facilities, especially for W-1 and W-2.

Final Adjustment

After electric cabling, Final Adjustment, including the installation of tank level switches and trial operation, will be done by SIWA, with the attendance of the engineer of the Supplier for Technical Guidance.

Fence

SIWA will install fences around the 4 boreholes. In order to protect against human interference, the fence shall be composed of a pipe frame structure and smaller interval wire mesh.

**(f) Rehabilitation of Mataniko and Kombito facilities**

The Stainless Riser Pipe is procured as the F/U Equipment. SIWA should replace it for the boreholes of the Mataniko and Kombito sites.

**(g) Final Inspection of rehabilitated facilities and issue of certificate**

When the Final Adjustment for the White River and Riser Pipe replacement for Mataniko and Kombito are successfully finished, SIWA will inspect all the facilities and equipment, as well as the Supplier's performance for the final delivery and Technical Guidance, with the Supplier. After confirmation of the proper function and equipment installation, SIWA will issue a "Certificate of

Completion” for the Supplier’s works to JICA and the Supplier.

**(3) Input Plans for Installation and Inspection**

The planned input of manpower and machinery for the installation and inspections are as shown in Figure I1.2-3.

Work and Input Items	Input Number	February 2006	March 2006	April 2006	May 2006
1. F/U Equipment Arrival at Honiara					
1-2 Pre-Delivery Inspection and issue of Certificate			□		
Manager of Engineering Service Department	1 person		■ 3 days		
Inspector	2 persons		■ 3 days		
2. Restoration of White River Facilities					
2-1 Restoration of Well Facilities					
Manager of Engineering Service Department	1 person			▨ (Schedule Control and Supervision)	
2-1-1 W-1			□		
Site Engineer	1 person		■ 3 days		
Workers	4 persons		■ 3 days		
Pickup	2 trucks		■ 3 days		
Crane Truck	1 truck		■ 1 day		
2-1-2 W-2			□		
Site Engineer	1 person		■ 3 days		
Workers	4 persons		■ 3 days		
Pickup	2 trucks		■ 3 days		
Crane Truck	1 truck		■ 1 day		
2-1-3 W-3			□		
Site Engineer	1 person		■ 3 days		
Workers	4 persons		■ 3 days		
Pickup	2 trucks		■ 3 days		
Crane Truck	1 truck		■ 1 day		
2-1-4 W-4			□		
Site Engineer	1 person		■ 3 days		
Workers	4 persons		■ 3 days		
Pickup	2 trucks		■ 3 days		
Crane Truck	1 truck		■ 1 day		
2-2 Restoration of Electric Power Cable					
2-2-1 Preparation for contracting		▨	▨		
Manager of Engineering Service Department	1 person			▨ (Contractor Selection)	
2-2-2 For W-1 and W-2				▨	
Manager of Engineering Service Department	1 person			▨ (Supervision)	
2-2-3 For W-3 and W-4				▨	
Manager of Engineering Service Department	1 person			▨ (Supervision)	
2-3 Water Transmission Pump Facilities					
Manager of Engineering Service Department	1 person			▨ (Schedule Control and Supervision)	
Site Engineer	1 person			■ 6 days	
Workers	4 persons			■ 6 days	
Pickup	2 trucks			■ 6 days	
2-4 Control Line for JICA White River Tank					
Manager of Engineering Service Department				▨ (Supervision)	
2-5 Final Adjustment					
Manager of Engineering Service Department	1 person			■ 2 days	
Site Engineer	1 person			■ 6 days	
Workers	2 persons			■ 6 days	
Pickup	2 trucks			■ 6 days	
2-6 Fence					
Manager of Engineering Service Department	1 person			▨ (Schedule Control and Supervision)	
Workers	4 persons			■ 12 days	

Source : JICA Study Team

**Figure I1.2-3 Input Schedules for Restoration of White River System**

## 12 Urgent Rehabilitation Plan for Tulagi

The water supply system for Tulagi has no disinfection facility, hence coli forms are sometimes found in the supplied water and the supplied water has a risk of pollution. A disinfection facility is indispensable in a drinking water supply system. Therefore the construction of a disinfection facility is planned as a form of Urgent Rehabilitation.

### (1) Location of the Disinfection Facility

The drinking water for Tulagi (Tulagi Island) is transmitted from the next island i.e. Florida Island. Since the house connection is branched after crossing the sea before the water reservoir, the appropriate location is a point just after the sea crossing.

### (2) Technical Specifications

The disinfection facility requires the following construction/equipment.

- 20m<sup>2</sup> of Chlorination Room (a building for the disinfection system)
- Chlorination Equipment; 2 sets (1 operation and 1 stand-by) of chlorinators, 1 set of chlorine mix tank, 1 set of chlorine stirrer, 1 set of electric control panel and other auxiliary materials such as pipes.

### (3) Estimated Cost

The estimated cost for this urgent rehabilitation is as shown in Table I1.2-1.

**Table I1.2-1 Estimated Cost of Urgent Rehabilitation in Tulagi**

Items by type of works	Cost in US\$
Construction of Chlorination Room	US\$ 21,600
Procurement of the Equipment	US\$ 8,684
Total	US\$ 30,284

Source : JICA Study Team

### (4) Fund Plan

The required SIWA's investment for the Urgent Rehabilitation will be US\$ 30,284. Since this rehabilitation is urgently required, SIWA should prepare the mentioned amount soon. However, SIWA is facing financial difficulty in such preparation and is thus recommended to request the financial assistance from the central government of the Solomon Islands or international donors. Based on the budgetary scale, a Japanese Fund "Grassroots Grant Assistance" is one of the candidate donor's programs. SIWA should maintain contacts with the Embassy of Japan, if they desire access to the mentioned funding.

### (5) Schedule

The work should be started as soon as possible after securing funding. The construction and equipment installation period will be for 5 months, including the equipment procurement.



No. of Month	1	2	3	4	5
<b>Contractor Selection</b>					
Quotation					
Evaluation of Quotation and Contract					
<b>Procurement of the Equipment</b>					
Manufacturing and Transport of Equipment					
Custom Clearance and Quantity Inspection					
<b>Construction/Installation of the Equipment</b>					
Building Construction					
Equipment Installation					
Final Adjustment and Inspection					

Source : JICA Study Team

**Figure I1.2-1 Tentative Implementation Schedule for Urgent Rehabilitation in Tulagi**

### **13 Urgent Rehabilitation Plan for Auki**

Since the rehabilitation project for the water supply system is under way in Auki thanks to the assistance of the Asian Development Bank (ADB), an urgent rehabilitation plan for Auki is not considered to be required.

# **PART J**

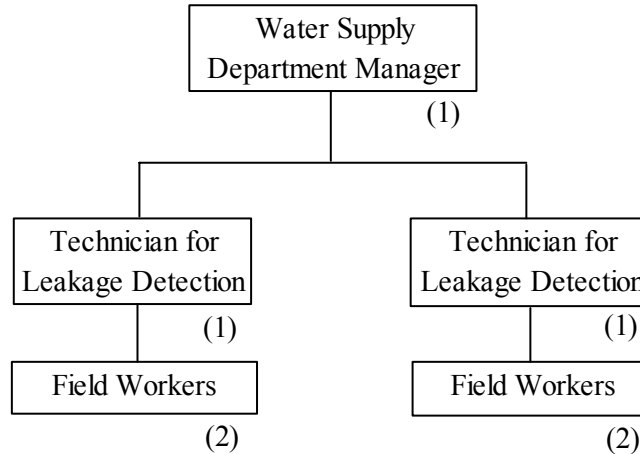
## **RECOMMENDATIONS**

## PART J RECOMMENDATIONS

### J1 Establishment of Leakage Reduction Unit

#### (1) Organization of Leakage Reduction Unit

In order to conduct leakage detection survey and replace pipelines with large leakage on a regular basis, SIWA should establish a leakage reduction unit consisting of seven (7) staff - two (2) technicians and four (4) field workers under the supervision of water supply department manager as shown in Figure J1-1.



Source : JICA Study Team

**Figure J1-1 Proposed Leakage Reduction Unit**

#### (2) Activities of Leakage Reduction Unit

The Leakage Reduction Unit to be established shall conduct the following work;

- To prepare a leakage reduction plan including target areas, leakage survey schedule, budget, etc. at the beginning of fiscal year.
- To conduct leakage survey and detect large leakage point or section on the pipeline according to the plan.
- To repair the pipelines or replace them with new pipes.
- To record the repairs and replacement of pipelines on the drawing.
- To update GIS data.

The detailed procedures for the leakage survey shall be referred to section F2.2 of PART F.

### J2 Monitoring and Development of Water Sources

Monitoring is necessary for development and management of water sources. Water sources should be monitored in both quantity (river discharge and groundwater level) and quality. The monitoring work should be carried out continuously before/after water resources development. Result of monitoring before the development will give information on its potential, and result of monitoring after the development will give information on its management. Before implementation of monitoring, network for the monitoring must be established. Then, items to be monitored and frequency of the monitoring can be decided.

In this Study, various kinds of field survey were carried out to observe river-discharge, groundwater-level and water quality at many points. It is proposed that the observation points of this Study should be established as new monitoring network. Regular monitoring (once a month) will give long-term fluctuation of river-discharge and water quality of the Study area. In addition to it,

productive boreholes should be included in the monitoring network, and groundwater level of the boreholes should be observed regularly.

### **J3 Countermeasures against Contamination of Water Source and Tap Water**

In the water quality survey of the Study, coliform group was detected in the groundwater from boreholes as a water source and from the tap water supplied through water distribution system. Therefore, SIWA should take following countermeasures.

#### **(1) Water Source**

- Concrete slab around boreholes should be reconstructed, which can prevent infiltration of wastewater into the ground.
- Type of septic tank should be changed from seepage type to storage type such as concrete pit. In this case, community septic tank is desirable in view point of maintenance by SIWA. Night soil will be regularly collected by vacuum truck of SIWA.
- For the area near the boreholes, public sewage collection and discharge system should be constructed

#### **(2) Tap Water**

- Residual chlorine at the end of distribution network must be checked more strictly.
- Daily maintenance of chlorination facilities and control of chlorine dosage should be done.

### **J4 Environment and Social Considerations**

In line with the Solomon Islands Environmental Impact Assessment Guidelines, the mid-term facility improvement plan and urgent rehabilitation plan do not require to carry out environmental impact assessment. Approval of implementation will be obtained from the Environmental and Conservation Division (ECD), Ministry of Natural Resources after submission of public environmental report (PER). However, it was found that there remain some issues or impacts on some aspects of both social and natural environment in the process of scoping. Therefore, SIWA should have consideration for the expected issues/impacts of social and natural environment, and also should monitor those issues/impacts during and after implementation of the plans.

### **J5 Enhancement of Public Relations/Participation Activities**

Complaints or opinions about SIWA's water supply services are reported in the newspaper. Result of the socio-economic survey also shows that most of the respondents have some opinions, complaints or requests/suggestions about water supply services. However, dissemination of information regarding water supply to the public is not enough to obtain understanding on policy and basic conditions of water supply services because there is no officer in charge of public relations.

Although draft strategic plan for community consultation and education and customer service was formulated in 1998, it has not been adopted and public relations activities are stagnant. Therefore, it is necessary to appoint a person in charge of public relations and community education. The officer in charge should review the strategic plan in line with the current business environment. In review of the strategic plan, key issues to be addressed should be identified and put in the strategies with performance indicators and methods to get that information. Based on the result of socio-economic survey and community workshops, the following aspects should be included in the strategic plan.

#### **(1) SIWA Staff Involvement in Public Relations/Participation Activities**

Field staff and metre readers should be involved in public relations/participation activities as well as customer services officers because they are most visible for the customers.

**(2) Regular Issue of Newsletters/Publications**

SIWA's policy, activities, information about water supply services should be disseminated periodically in order to obtain understanding user pay principle, water conservation, responsibility of the customers, etc.

**(3) Water Talks for School Children and Housewives**

One way to be successful in educating the general public in water use, especially in water conservation, is to instil awareness from a young age. By doing so, it is hoped that the children will grow up to be citizens who practise water conservation as part of daily life and not something which is done when there is a special campaign. In the process, the children will indirectly "educate" their parents and siblings as well. Housewives are prime users of water so it is also effective to raise housewives' awareness of water use behaviour, user pay principle, etc. in order to control water demand and save the expenses of water supply for both supply and demand sides.

**J6 Presentation of Options for Expanding and Improving Water Supply Services**

**(1) Access to the Piped Water for the Low Income Households**

It is not affordable for the low income households to connect the piped water individually because total amount of connection fee and deposit, which are to be paid for new connection, is almost same as annual average income of households in Burns Creek even though monthly water bills can be paid. In order to improve access to the piped water, it is necessary for SIWA to show some options to alleviate the burdens on new connection to the low income households. For this purpose, output of PP-4 is one of the options to consider the measures to improve access to the piped water for the low income households.

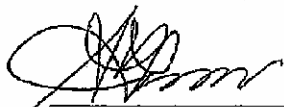
**(2) Repair of Leaking Taps and Pipes**

Many customers complain to SIWA about high water bill due to leakage. Repair of leakage from taps and pipes should be done by the customers, however some households do not have enough money to repair or replace the equipment. There are many cases where the leaking taps or pipes are left unfixed. According to the current system, the customer will inform SIWA when they identify leaking taps or pipes. However, some households cannot afford to repair the leaking taps and pipes. Improvement of water services equipment is important for promotion of water conservation as well as raising public awareness. Therefore, it is necessary for SIWA to show some options to make repair of leaking taps/pipes affordable or easy to practice. Cost sharing system examined under the PP-4 is much suggestive for this point.

# **APPENDICES**

SCOPE OF WORK  
FOR  
THE STUDY  
FOR  
REHABILITATION AND IMPROVEMENT  
OF SOLOMON ISLANDS WATER AUTHORITY'S  
WATER SUPPLY AND SEWERAGE SYSTEMS  
AGREED UPON BETWEEN  
SOLOMON ISLANDS WATER AUTHORITY  
AND  
THE JAPAN INTERNATIONAL COOPERATION AGENCY

Honiara, November 17, 2004

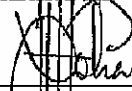


Mr. John Waki  
General Manger,  
Solomon Islands Water Authority



Mr. Omura Yoshiki  
Leader,  
Preparatory Evaluation Study Team  
Japan International Cooperation Agency

Witnessed by



Mr. Denn Tolia  
Permanent Secretary,  
Department of Mines and Energy  
Ministry of Natural Resources

## I. INTRODUCTION

In response to the request of the Government of Solomon Islands, the Government of Japan decided to conduct the Study for Rehabilitation and Improvement of Solomon Islands Water Authority's Water Supply and Sewerage Systems (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of Solomon Islands.

The present document sets forth the Scope of Work with regard to the Study.

This document will be effective after the examination by JICA Headquarters following the process of the JICA guidelines of environmental and social considerations.

## II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. To formulate a plan to improve the water supply and sanitary condition of Honiara, Tulagi, Auki, Noro for the target year 2010;
2. To support the capacity development of Solomon Islands Water Authority (hereinafter referred to as "SIWA") to operate and maintain the water supply facilities in the course of the Study.

## III. STUDY AREA

The Study will cover Honiara, Tulagi, Auki, Noro. (The study area map is shown in the Appendix 1)

## V. SCOPE OF THE STUDY

Component I: the rehabilitation and improvement planning of water supply and sanitation system toward the target year 2010

- 1) Urgent rehabilitation plan
  - To identify needs of rehabilitation of the facilities which were constructed under Japan's Grant Aid for JICA's follow-up cooperation
  - To prepare the procurement document for JICA's follow-up cooperation
  - To identify urgent needs of rehabilitation of the facilities in prioritized area(s)



- 2) Mid-term Facility Improvement plan:
  - i) Water demand projection
  - ii) Facility plan
    - water resources potential for water supply including monitoring of the existing water sources
    - optimization of water distribution system
  - iii) Unaccounted-for water reduction program
  - iv) Customer survey (including willingness-to-pay, customers perception and aspiration of the unserved)
  - v) Financial management program (including tariff system, meter reading and bill collection)
  - vi) Project evaluation
  - vii) Sanitation improvement plan
  - viii) Preparation of detailed terms of reference for Component II

**Component II: Support for the capacity building of SIWA**

(The concrete TOR will be considered during implementing the Component I of the Study)

- i) strengthening of management
  - a) management and financial situation analysis and proposals for improvement
  - b) unaccounted-for water reduction
  - c) optimum water tariff structure and efficient bill-collection
  
- ii) strengthening of public relations
  - a) catchment management to protect the water resources
  - b) water supply for the vulnerable and poor
  - c) promotion of water conservation

**V. SCHEDULE OF THE STUDY**

The Study will be carried out in accordance with the tentative schedule as attached in Appendix 2. The schedule is tentative and subject to modification when both parties agree upon any necessity that should arise during the course of the Study.

**VI. REPORTS**

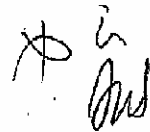
JICA shall prepare and submit the following reports in English to SIWA.

1. Inception Report: Fifteen (15) copies at the commencement of the study
2. Interim Report: Fifteen (15) copies
3. Draft Final Report: Fifteen (15) copies

4. Final Report: Twenty (20) copies with PDF format data

**VII. UNDERTAKINGS OF THE GOVERNMENT OF SOLOMON ISLANDS**

1. To facilitate the smooth conduct of the Study, the Government of Solomon Islands will take necessary measures:
  - (1) To secure the safety of the Japanese study team (hereinafter referred to as "the Team"),
  - (2) To permit the members of the Team to enter, leave and sojourn in Solomon Islands for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,
  - (3) To exempt the members of the Team from taxes, duties, fees and any other charges on equipment, vehicles, and other materials brought into Solomon Islands for the conduct of the Study,
  - (4) To exempt the members of the Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study,
  - (5) To provide necessary facilities to the Team for the remittances as well as the utilization of the funds introduced into Solomon Islands from Japan in connection with the implementation of the Study,
  - (6) To secure permission for the Team to enter into private properties or restricted areas for the implementation of the Study,
  - (7) To secure permission for the Team to take all data and documents including photographs and maps related to the Study out of Solomon Islands to Japan, and
  - (8) To provide medical services in case of necessity, such expenses to be charged to the members of the Team.
2. The Government of Solomon Islands shall bear claims, if any arise, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Team.
3. SIWA shall act as a counterpart agency to the Team and also as a coordinating body in relation with other governmental and non-governmental organizations for the smooth implementation of the Study.
4. SIWA shall at its own expense, provide the Team with the following, in cooperation with other organizations concerned:
  - (1) available data and information related to the Study,

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- (2) additional survey related to the Study, if necessary,
- (3) counterpart personnel and supporting staff,
- (4) suitable office space with necessary equipment in Honiara
- (5) credentials or identification cards.

**VIII. UNDERTAKINGS OF JICA**

For the implementation of the Study, JICA shall take the following measures:

- 1. To dispatch, at its own expense, the Team to Solomon Islands, and
- 2. To pursue technology transfer to counterpart personnel in the course of the Study.

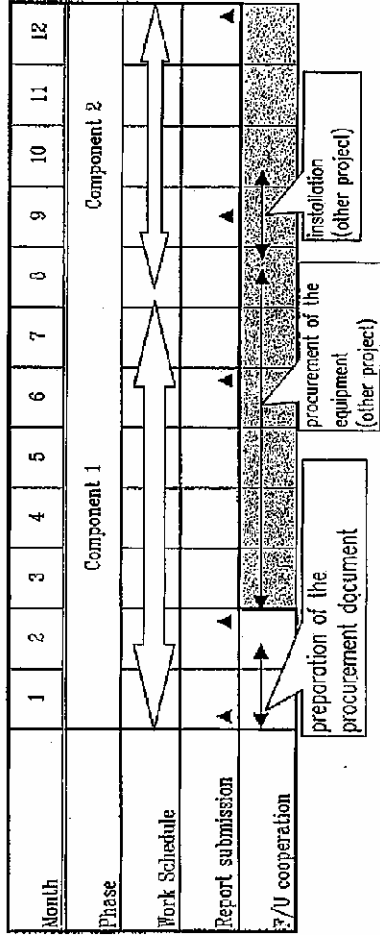
**IX. CONSULTATION**

JICA and SIWA will consult with each other in respect of any matter that may arise from or in connection with the Study.

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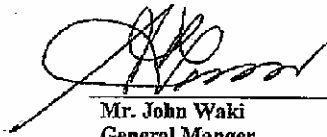
Tentative Schedule  
 THE STUDY FOR REHABILITATION AND IMPROVEMENT OF SOLOMON ISLANDS WATER AUTHORITY'S WATER SUPPLY AND SEWERAGE SYSTEMS



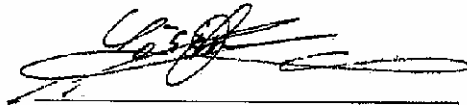
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MINUTES OF MEETING  
FOR  
THE STUDY FOR REHABILITATION AND IMPROVEMENT  
OF SOLOMON ISLANDS WATER AUTHORITY'S  
WATER SUPPLY AND SEWERAGE SYSTEMS  
AGREED UPON BETWEEN  
SOLOMON ISLANDS WATER AUTHORITY  
AND  
THE JAPAN INTERNATIONAL COOPERATION AGENCY

Honiara, November 17, 2004



Mr. John Waki  
General Manger,  
Solomon Islands Water Authority



Mr. Omura Yoshiki  
Leader,  
Preparatory Evaluation Study Team  
Japan International Cooperation Agency

Witnessed by



Mr. Donn Tolia  
Permanent Secretary,  
Department of Mines and Energy  
Ministry of Natural Resources

In response to the official request of development studies of the Government of Solomon Islands, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Evaluation Study Team, headed by Mr. Omura Yoshiaki (hereinafter referred to as "the mission"), to Solomon Islands from October 24<sup>th</sup> to November 25<sup>th</sup>, 2004 to discuss the Scope of Works (hereinafter referred to as "S/W") for the Study for Rehabilitation and Improvement of Solomon Islands Water Authority's Water Supply and Sewerage Systems (hereinafter referred to as "the Study").

During its stay in Solomon Islands, the mission carried out field surveys in the study areas, and held a series of discussions with Solomon Islands Water Authority (hereinafter referred to as "SIWA"), Department of Mines and Energy (Ministry of Natural Resources) and other authorities concerned. The list of those whom the mission met with is shown in Appendix 1.

The minutes of meeting have been prepared for the better understanding of the S/W agreed upon between SIWA and the mission.

The main items that were discussed on and agreed to by both sides are summarized as follows.

**1 The title of the Study**

SIWA and the mission agreed to name the Study as following:

Revised: the Study for Rehabilitation and Improvement of Solomon Islands Water Authority's Water Supply and Sewerage Systems

Original: the Project for Improvement and Rehabilitation of Solomon Islands Water Authority's Water Supply and Sewage Infrastructure

**2 The JICA guidelines of environmental and social considerations**

The mission explained the JICA guidelines of environmental and social considerations, and SIWA agreed to implement the Study in compliance with the guidelines.

The Study is categorized as "B" at this stage and the mission will conduct the provisional scoping with SIWA during its stay.

JICA headquarters will confirm the result of the scoping in compliance with the guidelines. The mission will inform SIWA in writing of confirmation no later than the end of December 2004.

**3 Clearance for the field survey**

The mission requested that SIWA should acquire the permission from landowners and ministries concerned to implement the Study in the customary lands, where SIWA currently maintains or plans to develop water sources or facilities before commencement of the Study.

**4 The Follow-up Cooperation**

**1) confirmation of the facilities requested to rehabilitate by SIWA**

The mission and SIWA confirmed the conditions of the water supply facilities, which were constructed under the Japan's Grant Aid as attached in Appendix 2.

SIWA submitted the list of items for the follow-up cooperation as attached in

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Appendix 3. SIWA requested that the underground electric power cables, of which submersible pumps are to be replaced, should be laid overhead for convenience of maintenance work.

The mission requested to explain the conditions of all the submersible pumps, which were procured under Japan's Grant Aid. SIWA agreed to submit a report of them to the mission by November 25<sup>th</sup> 2004

**2) selection criteria**

The mission identified the need of the follow-up cooperation to rehabilitate the facilities damaged.

SIWA and the mission agreed that the items would be selected according to the following criteria.

- (1) urgency
- (2) sustainability of operation and maintenance
- (3) technical viability (sustainable productivity of the boreholes to be confirmed)
- (4) clearance of water right and access to works site

**3) the borehole W4 in White River System**

SIWA mentioned that the borehole W-4 in White River is still under process of negotiation to use as water source. The mission requested, and SIWA agreed that it should be cleared before the commencement of the Study if the borehole should be rehabilitated under the follow-up cooperation.

**5 Capacity building**

Both sides emphasized the importance of technical transfer in the process of the Study to facilitate the capacity building and human resources development of SIWA.

**6 Undertaking of the Government of Solomon Islands**

- 1) As to VII.1. (7) and 4.(1) of S/W, the mission requested SIWA to take necessary procedures to permit the Study Team to take available data abroad (including maps and photographs) and information related to the Study. SIWA notified that they would provide convenience to the Study Team as much as possible according to laws and regulations of the Solomon Islands.
- 2) As to VII.4.(3) of S/W, the mission requested SIWA that counterpart personnel of the Study should be selected before the commencement of the Study for ensuring better cooperation, to which SIWA agreed.
- 3) As to VII.4.(4) of S/W, SIWA agreed that the air-conditioned office space with office furniture, telephone line and electricity would be provided in Honiara for the use of the Study Team. The telephone charge will be borne by the Study Team.
- 4) SIWA requested the mission to provide transportation for the Study Team at JICA's own expense. The mission agreed to convey this request to JICA Headquarters for the positive consideration.

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Appendix 1

List of those whom the mission met

Department of Mines and Energy

Mr. Donn Tolia, Permanent Secretary

Mr. Charlie Bepapa, Director of Water Resources

Solomon Islands Water Authority

Mr. John Waki, General Manager

Hon. Jeffery Teava, Chairman SIWA Board

Mr. Moon Pin Kwan, Board Director

Mr. Ray Andersen, Divisional Manager, Engineering Services

Mr. Roger Townshend, Divisional Manager, Finance & Sales

Mr. Justus Denni, Divisional Manager, Support Services

Mr. Silas Talosui, Engineer Province

*i*  
*Paul*  
*Ⓟ*

Situation of Water Source System constructed under Japan's Grant Aid

Water Source System	Situation	Condition of equipment	Remarks
<b>WHITE RIVER SYSTEM</b>			
Borehole W1	out of order	The submersible pump removed The submersible pump control damaged The electric line disconnected and damaged	pumping test required
Borehole W2	out of order	The submersible pump removed The electric line disconnected and damaged	pumping test required
Borehole W3	under repair	SIWA is refitting a submersible pump, submersible pump control and electric line.	SIWA is repairing by itself.
Borehole W4	out of order	The submersible pump removed The submersible pump control damaged The electric line disconnected and damaged	pumping test required
Booster facility	under repair	3 booster pumps damaged Distribution control damaged	need to make booster pumps checkers on their repairabilities SIWA is repairing by itself.
Chlorinator	in operation	SIWA has repaired.	
Electric lines	out of order	Out at the connection of each submersible pump control panel	need to check the condition technically
<b>White River Tank</b>			
<b>MATANIKO SYSTEM</b>			
Borehole M1	in operation		
Borehole M2	in operation		
Borehole M3	out of order	the borehole had dried up.	need to make the borehole checked on the possibility reactivated
Borehole M4	in operation		
Borehole M5	in operation		
Booster facility	in operation		
Chlorinator	in operation		
Skyline Tank	out of order	leakage	
<b>KOMBITO SYSTEM</b>			
Borehole K1	out of order	The submersible pump removed The submersible pump control damaged The electric line disconnected and damaged	
Borehole K2	out of order	The submersible pump in the borehole The submersible pump control damaged	need to make the submersible pump checked on the reparability
Electric lines	out of order	The electric line disconnected and damaged Out at the connection of each submersible pump control panel	
Panatina (Kochin) Tank	out of order	leakage	

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**APPENDIX 3:  
LIST OF ITEMS FOR THE FOLLOW-UP COOPERATION.**

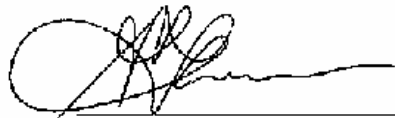
LOCATION & ITEM	ITEM DESCRIPTIONS	ITEM QUANTITY	UNIT
<b>Kombito</b>			
1	Submersible pump	2	piece (pcs)
2	Submersible pump control	2	pcs
3	Distribution control	1	pcs
4	Spare Parts for maintenance and repair of 2 sets of submersible pump at Kombito well site.	1	package (pkg)
5	Electrical Cables	1200	m
6	Pipes (4" galv. Iron risers)	50	pcs
7	Installation	1	only
<b>White River</b>			
<b>Submersible Pumps</b>			
1	Submersible pump	4	piece (pcs)
2	Submersible pump control	4	pcs
3	Distribution control	1	pcs
4	Spare Parts for maintenance and repair of 4 sets of submersible pump at White River well site.	1	package (pkg)
5	Electrical Cables	1500	m
6	Pipes (4" galv. Iron risers)	70	pcs
7	Installation	1	only
<b>Booster Pumps</b>			
8	Booster pump	3	pcs
9	Booster pump control	1	pcs
10	Spares package	1	pkg
11	Installation	1	only
<b>Chlorinator</b>			
12	Dosing pump	1	pcs
13	Mixing tank	1	pcs
14	Stirrer	1	pcs
15	Controls	1	pcs
16	Spares package	1	pkg
17	Installation	1	only
<b>Mataniko</b>			
1	Spare Parts for maintenance and repair of 4 sets of submersible pump at mataniko well site.	1	pkg
<b>Rehabilitation of Reservoir Tanks</b>			
1	Materials package (for Skyline, White River, Kombito tanks)	1	only
2	Installations	1	only

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*(Signature)*

**MINUTES OF MEETING  
ON  
INCEPTION REPORT  
FOR  
THE STUDY FOR REHABILITATION AND IMPROVEMENT OF  
SOLOMON ISLANDS WATER AUTHORITY'S  
WATER SUPPLY AND SEWERAGE SYSTEMS**

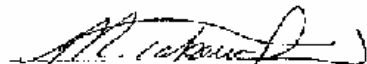
**AGREED UPON BETWEEN  
SOLOMON ISLANDS WATER AUTHORITY  
AND  
THE STUDY TEAM  
OF  
JAPAN INTERNATIONAL COOPERATION AGENCY**

Honiara, May 23, 2005




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Mr. John WAKI  
General Manager  
Solomon Islands Water Authority



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Mr. Masahiro TAKEUCHI  
Leader of the Study Team  
Japan International Cooperation Agency



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Mr. Steven-Daniel LKAVEKE  
Supervising Permanent Secretary  
Department of Mines and Energy  
Ministry of Natural Resources

The Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, sent a study team to the Solomon Islands on May 16, 2005 to conduct "The Study for Rehabilitation and Improvement of Solomon Islands Water Authority's Water Supply and Sewerage Systems" (hereinafter referred to as "the Study") in agreement on the Scope of Work for the Study between Solomon Islands Water Authority, Department of Mines and Energy, Ministry of Natural Resources on behalf of the Government of Solomon Islands (hereinafter referred to as "the Solomon side") and JICA on November 17, 2004 in Honiara.

The Study Team submitted fifteen (15) copies of the Inception Report in English to the Solomon side on May 18, 2005.

A series of cordial discussions took place on the Inception Report for the Study between the Study Team and the officials of the Solomon side. The attendants of the meetings are listed in Appendix-1. The following are the main points of discussions and agreements reached during the meetings

1. The Solomon side accepted in principle the contents of the Inception Report.
2. The Solomon side agreed on the undertakings of the Government of Solomon Islands as stated in the Inception Report and mentioned that they will extend their fullest cooperation to the Study Team in fulfilling the Study for the success.
3. **Follow-up Cooperation**  
Regarding the follow-up cooperation requested by the Solomon side, SIWA and the Japanese side agreed that in principle the Japanese side will be responsible for supplying equipment and SIWA will be responsible for installation work including civil works. The contents of the installation work will be clarified through the field survey. The items of follow-up cooperation shall be examined and approved by JICA Headquarters.
4. **Pumping Test**  
SIWA agreed on lending a pump to the Study Team whenever the Team needs it for pumping test which will be done for determining the specifications of the pump in the follow-up project.
5. **Financial Restructuring Plan for SIWA**  
The Study Team recognizes that there could be some duplication in the TOR of Financial Restructuring Plan for SIWA, which is shown in the letter of Department of Mines and Energy on 26 April 2005. The Study Team agreed to make their best efforts in avoiding duplication and in making the results of studies complemented each other under the coordination of the Government of Solomon Islands and SIWA. The Study Team requested the Solomon side to set up a proper framework for information sharing and cooperation in case the study of Financial Restructuring Plan is ready to start.
6. The Solomon side appointed counterpart personnel and supporting staff of SIWA in accordance with the Minutes of Meetings on the Scope of Work for the Study signed on November 17, 2004.



**Appendix-1**

**List of Attendants of the Meetings**

1. Solomon Side

Department of Mines and Energy, Ministry of Natural Resources

Mr. Donn H. TOLIA	Permanent Secretary
Mr. Charles BEPAPA	Director of Water Resources
Mr. Isaac LEKELAJU	Deputy Director of Water Resources

Solomon Islands Water Authority (SIWA)


Mr. John WAKI	General Manager
Mr. Ray ANDRESEN	Division Manager, Engineering Services
Mr. Roger TOWNSHEND	Division Manager, Finance & Sales
Mr. Justus DENNI	Division Manager, Support Services

Ministry of Finance

Ms. Darcy TOZAKA	Policy Analyst, Economic Reform Unit, Dept. of Finance
Mr. Bradley BROWN	Advisor, Economic Reform Unit, Dept. of Finance

2. Japanese Side

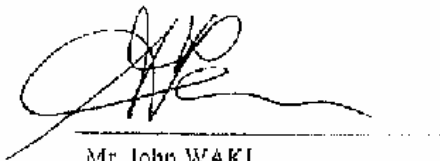
Mr. Shinichi MASUDA	JICA Headquarters
Ms. Yoko ASANO	JICA Solomon Islands Office
Mr. Michael SAIJINI	JICA Solomon Islands Office
Mr. Masahiro TAKEUCHI	Team leader of the Study Team
Mr. Masaaki UEDA	The Study Team member
Mr. Katsumi FUJII	The Study Team member
Mr. Takayuki MIYAMOTO	The Study Team member
Mr. Akihiko OKAZAKI	The Study Team member
Mr. Hiroshi NAKAMURA	The Study Team member
Mr. Tamotsu SHINGU	The Study Team member



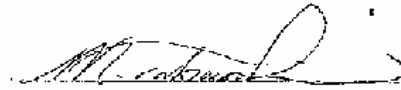
MINUTES OF MEETING  
ON  
INTERIM REPORT  
FOR  
THE STUDY FOR REHABILITATION AND IMPROVEMENT OF  
SOLOMON ISLANDS WATER AUTHORITY'S  
WATER SUPPLY AND SEWERAGE SYSTEMS

AGREED UPON BETWEEN  
SOLOMON ISLANDS WATER AUTHORITY  
AND  
THE STUDY TEAM  
OF  
JAPAN INTERNATIONAL COOPERATION AGENCY

Honara, November 11, 2005



Mr. John WAKI  
General Manager  
Solomon Islands Water Authority  
(SIWA)



Mr. Masahiro TAKEUCHI  
Leader of the Study Team  
Japan International Cooperation Agency  
(JICA)

The Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, sent a study team to the Solomon Islands on May 16, 2005 to conduct "The Study for Rehabilitation and Improvement of Solomon Islands Water Authority's Water Supply and Sewerage Systems" (hereinafter referred to as "the Study") in agreement on the Scope of Work for the Study between Solomon Islands Water Authority, Department of Mines and Energy, Ministry of Natural Resources on behalf of the Government of Solomon Islands (hereinafter referred to as "the Solomon side") and JICA on November 17, 2004 in Honiara.

The Study Team submitted fifteen (15) copies of the Interim Report in English to the Solomon side on November 9, 2005.

A series of cordial discussions took place on the Interim Report for the Study between the Study Team and the officials of the Solomon side. The attendants of the meetings are listed in Appendix-1. The following are the main points of discussions and agreements reached during the meetings.

1. The Solomon side accepted in principle the contents of the Interim Report.

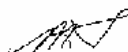
2. Pilot Projects

The Study Team confirmed with the Solomon side that they selected the following pilot projects which were discussed in Phase-1 and will conduct these projects during the study in Solomon for Phase-2. The Team requested the Solomon side to cooperate the Team for their execution and the Solomon side agreed to do so.

- Formulation of tariff collection improvement method
- Establishment of leakage reduction indicator
- Water conservation campaign
- Installation of shared standing pipe

3. Realization of the Project proposed in the Mid-term Facility Improvement Plan

The Solomon side intends to promote the projects for water supply facility improvement in Honiara and Auki which were proposed in the Interim Report. The Solomon side stated that they have already submitted the application for Japan's grant aid to implement these projects this September. The Solomon side expects the consideration of the Government of Japan for the request.





Appendix-I

**List of Attendants of the Meeting**

1. Solomon Side

Department of Mines and Energy, Ministry of Natural Resources

Mr. Donn H. TOLJA	Permanent Secretary
Mr. Charles BEPAPA	Director of Water Resources
Mr. Isaac LEKELALU	Deputy Director of Water Resources

Solomon Islands Water Authority (SIWA)

Mr. John WAKI	General Manager
Mr. Ray ANDRESEN	Division Manager, Engineering Services
Mr. Roger TOWNSEND	Division Manager, Finance & Sales
Mr. Justus DENNI	Division Manager, Support Services

2. Japanese Side

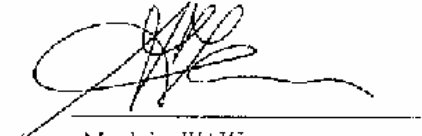
Ms. Yoko ASANO	JICA Solomon Islands Office
Mr. Masahiro TAKEUCHI	Team leader of the Study Team
Mr. Masaaki UEDA	The Study Team member
Mr. Nobuyuki HIRAMA	The Study Team member



MINUTES OF MEETING  
ON  
DRAFT FINAL REPORT  
FOR  
THE STUDY FOR REHABILITATION AND IMPROVEMENT OF  
SOLOMON ISLANDS WATER AUTHORITY'S  
WATER SUPPLY AND SEWERAGE SYSTEMS

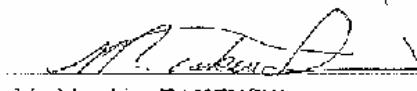
AGREED UPON BETWEEN  
SOLOMON ISLANDS WATER AUTHORITY  
AND  
THE STUDY TEAM  
OF  
JAPAN INTERNATIONAL COOPERATION AGENCY

Honiara, May 26, 2006



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Mr. John WAK  
General Manager  
Solomon Islands Water Authority  
(SIWA)



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Mr. Masahiro TAKEUCHI  
Leader of the Study Team  
Japan International Cooperation Agency  
(JICA)

In accordance with the Scope of Work for the Study for Rehabilitation and Improvement of Solomon Islands Water Authority's Water Supply and Sewerage Systems (hereinafter referred to as "the Study") agreed upon between Solomon Islands Water Authority, Department of Mines and Energy, Ministry of Natural Resources on behalf of the Government of Solomon Islands (hereinafter referred to as "the Solomon side") and Japan International Cooperation Agency (hereinafter referred to as "JICA"), JICA dispatched a Study Team for the Study (hereinafter referred to as "the Study Team") to Solomon and commenced the Study in May 2005. The Study has been well conducted through two passes in good collaboration with the Study Team and the counterpart, and reached the final stage.

The Study Team submitted fifteen (15) copies of the Draft Final Report of the Study to the Solomon side in Honiara on May 23, 2006. Series of meetings and discussions were held between the Solomon side and the Study Team. The participants of the meetings are listed in Appendix-1.

The following are the main points of discussions and agreements reached during the meetings.

1. The Solomon side accepted in principle the contents of the Draft Final Report.
2. Project Implementation  
The Solomon side intends to promote the projects for water supply facility improvement in Honiara and Auki which were proposed in the Draft Final Report. The Solomon side stated that they have already submitted the application for Japan's grant aid to implement these projects September 2005. The Solomon side expects the consideration of the Government of Japan for the request.
3. Transfer of the Equipment  
The Solomon side wishes to request that the equipment used during the Study be donated to SIWA for sustaining the results of the Study. SIWA submitted a request letter to JICA Headquarters through the Study Team.
4. Submission of Comments from the Solomon Side  
The Solomon side promised to submit the comments in writing on the Draft Final Report to the Japanese side through JICA Solomon Islands office by June 20, 2006. The Study Team will finalize the Final Report of the Study taking into account the comments. Any comments after this date will not be taken into account.
5. Disclosure of the Reports  
Both sides confirmed that all the reports would be open to the public in order to achieve maximum use of the Study results. This has been discussed and agreed in the meetings on the Scope of Work for the Study.

Appendix-1

**List of Attendants of the Meeting**

1. Solomon Side

Department of Mines and Energy, Ministry of Natural Resources

Mr. Donn H. TOUJA	Permanent Secretary
Mr. Charles BEPAPA	Director of Water Resources
Mr. Isaac LEKELALU	Deputy Director of Water Resources

Solomon Islands Water Authority (SIWA)

Mr. John WAKI	General Manager
Mr. Ray ANDRSEN	Division Manager, Engineering Services
Mr. Roger TOWNSHEND	Division Manager, Finance & Sales
Mr. Reuben TOVITOVU	Division Manager, Support Services
Mrs. Freda UNUSI	Department Manager, Finance & Sales
Mr. Silas TALOSUI	Department Manager, Engineering Services
Mr. Chris MERICO	Department Manager, Engineering Services

2. Japanese Side

Mr. Shinichi MASUDA	JICA Headquarters
Ms. Yoko ASANO	JICA Solomon Islands Office
Mr. Masahiro TAKEUCHI	Team leader of the Study Team
Mr. Masaki UEDA	The Study Team member
Mr. Takayuki MIYAMOTO	The Study Team member
Mr. Akihiko OKAZAKI	The Study Team member

