

CHAPTER 3 PROJECT EVALUATION AND RECOMMENDATIONS

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3.1 Project Effects

The existing conditions and issues to be addressed by the Project and expected direct and indirect effects are summarized as shown in Table 3.1.

Table 3.1 Effects of Projects and Degree of the Improvement

Present Situation and Constraints	Measures Taken by the Project (Project Components)	Project Effects and Extent of Improvement	
Direct Effects			
1.	<ul style="list-style-type: none"> • Water is directly distributed to the users from water lift pumps of the existing water source wells in Corriverton area. Operation time of the lift pumps are 12 hours per day from 6:00 AM to 6:00 PM in principle to cut down the electricity cost. Water supply not only stops during night time and but also even day time in some areas due to low water pressure. • There is a high risk of bacteriological contamination as chlorine disinfection is not applied presently. Also acceptability is impaired by obnoxious smell and taste and colouring due to high iron concentration. • Low coverage of the water meter (Approx. 10%) results in difficulty in applying the metered water tariff. 	<ul style="list-style-type: none"> • Rehabilitation of the existing wells and installation of WTPs, water reservoirs and elevated water tanks. • Procurement of water meters 	<ul style="list-style-type: none"> • Bacteriological contamination risk is reduced by the installation of WTPs. • Iron concentration in supplied water is controlled under 0.3 mg/l and obnoxious smell and taste and colouring will be diminished. • 24 hour continuous water supply is enabled by 24 hour facilities operation and installation of water reservoirs. • Sufficient water pressure is ensured at the end of the network by the elevated water tank, enabling water flow from hydrants of the 2nd floor. • Revenue of GWI increases by adopting the metered water tariff.
Indirect Effects			
1.	<ul style="list-style-type: none"> • Risk of alimentary disease by bacteriological contamination is high. 	<ul style="list-style-type: none"> • Safe water is supplied steadily. 	<ul style="list-style-type: none"> • Disease risk is reduced.
2.	<ul style="list-style-type: none"> • Users consciousness to water saving is considered poor. • Water consumption is not grasped resulting in weak leakage water management. 	<ul style="list-style-type: none"> • Water consumption is measured. 	<ul style="list-style-type: none"> • Users' consciousness to water saving is encouraged decreasing .wasted water. • Leakage control is enabled by monitoring water use rate.

3.2 Recommendations

In order the Project facilities to achieve the expected effects, the facilities to be maintained properly and the water supply service in Guyana to be sustainable, Guyana is required to take the initiative in the following activities:

(1) Early Implementation of Leakage Control

The facilities in the Project were designed based on the per capita water consumption of 180 l/capita/day by adopting the GWI's Design Standards. However, actual water supply was estimated at 500 l/capita/day based on the GWI's pump operation records, consequently water wastage by users and leakage in the distribution network were estimated to be major causes of poor water quantity and water pressure. Under these circumstances, if the Project is implemented and water is supplied at the rate of 180 l/capita/day, it is concerned that apparent water shortage would occur. Therefore, the leakage control is the preconditions for the Project to achieve expected effects and the Project shall be implement only when the implementation of the leakage control is secured

GWI has already started the Leakage Control Programme by assistance of DFID and it is required that the Programme is further implemented in time with the progress of the Project so that the effects of the Programme are achieved in the Project area.

(2) Enforcement of Chlorine Disinfection

Even the above Leakage Control Programme is implemented as scheduled, it is expected it will take a couple of years until complete effects are achieved. Therefore, the Project will leave the existing wells which are not used as the water sources for the new WTPs as they are so that they can supplement water in case when water shortage occurs. However, if water not disinfected is supplemented, bacteriological safety of water is secured no longer and one of objectives of the Project may not be achieved. Therefore, GWI shall enforce disinfection by installing chlorine disinfection equipment to the existing wells when GWI apply transitional supplemental operation of the existing wells.

(3) Installation of Water Meters Procured

The installation of the water meters is considered a part of the leakage control mentioned in (1). GWI's Leakage Control Programme is based on the district metered area method, which requires installation of the water meters to each users to grasp the actual water consumption rate.

(4) Introduction of Meter Based Tariff

The installation of the water meter is considered as a part of the leakage control programme and is also considered to be means to enable the introduction of the meter based water tariff from management view point. The installation rate of water meter in the Project area is estimated at approximately 10%, no meter based water tariff, however is applied even to the users with water meter but the fixed rate is applied.

The introduction of the meter based water tariff will increase the revenue form the water tariff and could encourage the users consciousness to water saving. Trial calculation in this study estimated 20% increase of revenue by introduction of the meter based water tariff.

Therefore, it is recommended that the meter based water tariff be applied as early as possible after the installation of the water meters.

3.3 Appropriateness of the Project

The Project is judged to be appropriate as a Japanese grant aid project from following points:

- The project will benefit all the residents in Corriverton area and the benefit population is estimated at 32,000 in 2006 and 36,600 in 2015. The Project ensures safety and acceptability of drinking water and 24 hour continuous water supply with sufficient water pressure, contributing to the improvement of the people's living environment.
- Water supply facilities constructed by the Project will be operated and maintained by GWI which has been operating the same type of facilities, GWI, therefore, is not expected to have particular difficulty in their operation and maintenance
- It can be expected that the water meters procured will be installed as scheduled and maintained properly since GWI has already established plans for the installation, repairing and calibrating of the water meters.
- The Project will be implemented as one of measures to achieve the improvement of the service quality which was specified as one of conditions of the GWI's Operation License
- No adverse environmental effects are expected.

3.4 Conclusion

It was confirmed that the implementation of the Project is appropriate because the Project would contribute to the improvement of the sanitary and living environment of the residents in Corriverton area, as well as the above mentioned effects are expected from the Project. No problems are expected in the operation and maintenance of the facilities to be constructed by the Project. However, in order the Project to achieve the expected effects it is necessary to reduce the leakage loss by installing water meters procured in the Project to all the users in the earlier stage, applying meter rate water tariff, accelerating the on-going leakage control programme and establishing leakage monitoring and repairing system.

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Attachment 1: Member List of Study Team

Team of Basin Design Study

Name	Title	Organization	Mission Period
Mr. OMURA Yoshiki	Team Leader	Senior Advisor, Institute for International Cooperation), JICA	13 to 20 November 2005
Mr. MATSUMOTO Shigeyuki	Planning management	Project Management Group III, Grant Aid Management Department, JICA	13 to 20 November 2005
Mr. TAKECHI Akira	Chief consultant/Water supply planner/O&M specialist	Tokyo Engineering Consultants Co., LTD.	13 November to 23 December 2005
Mr. SHINDO Masaaki	Treatment planner and designer/Water source planner (2)	Tokyo Engineering Consultants Co., LTD.	14 November to 22 December 2005
Mr. SATO Yurai	Distribution planner and designer	Tokyo Engineering Consultants Co., LTD.	22 November to 22 December 2005
Mr. TSUKUDA Matasaburo	Construction planner/Cost estimate specialist	Tokyo Engineering Consultants Co., LTD.	28 November to 22 December 2005
Mr. KAWACHI Masahiro	Water source planner	Tokyo Engineering Consultants Co., LTD.	1 to 22 December 2005

Team of Explanation of the Draft Report

Name	Title	Organization	Mission Period
Mr. NAKAMURA Toshiyuki	Team Leader	Deputy Resident Representative, JICA USA Office, JICA	21 to 25 March 2006
Mr. TAKECHI Akira	Chief consultant/Water supply planner/O&M specialist	Tokyo Engineering Consultants Co., LTD.	18 to 27 March 2006
Mr. SATO Yurai	Distribution planner and designer	Tokyo Engineering Consultants Co., LTD.	18 to 27 March 2006

Attachment 2: Itinerary of Study Team

Basic Design Study

Date		JICA Officials	Chief Consultant/Water supply Planner/O&M	Treatment planner and designer/Water source	Distribution planner and designer	Construction Planner/Cost	Water Source Planner (1)
		OMURA, MATSUMOTO	TAKECHI Akira	SHINDO Masaaki	SATO Yarai	TSUKUDA Matasaburo	KAWACHI Masahiro
13 Nov.	Sun	Tokyo - Houston - Caracas					
14 Nov.	Mon	Courtesy call on EOJ		Tokyo - New York -			
15 Nov.	Tue	Caracas - Georgetown		- Georgetown			
16 Nov.	Wed	Courtesy call on Honorary Consul, MFTIC, MHW and GWI					
17 Nov.	Thu	Discussion on M/D, Courtesy call on DFID and IDB					
18 Nov.	Fri	Discussion on and signing M/D					
		Georgetown -	Mobilization				
19 Nov.	Sat	- New York -	Mobilization				
20 Nov.	Sun	- Tokyo	Meeting with Sub-contractor				
21 Nov.	Mon		Meeting with CP				
22 Nov.	Tue		Meeting with Sub-contractor (Water Quality)	Tokyo - N. York -			
23 Nov.	Wed		Population, Demand	G'town - N. Amsterdam	- Georgetown		
24 Nov.	Thu		Projection	Water Source Survey	Mobilization		
25 Nov.	Fri		G'town - N. Amsterdam		G'town - N. Amsterdam		
26 Nov.	Sat		Site Reconnaissance				
27 Nov.	Sun		Visiting existing similar facilities				
28 Nov.	Mon		Data Collection (GWI Division 5 Office)		Tokyo - N. York -		
29 Nov.	Tue		N. Amsterdam - G'town		- Georgetown		
30 Nov.	Wed		Soil Survey		Meeting with Subcontractors		Tokyo - N. York -
1 Dec.	Thu		GWI Site	Existing facilities survey			- Georgetown
2 Dec.	Fri		EPA EIA procedures				
3 Dec.	Sat		G'town - N. Amsterdam		G'town - N. Amsterdam	G'town - N. Amsterdam	
4 Dec.	Sun		Internal Meeting				
5 Dec.	Mon		Site Reconnaissance				
6 Dec.	Tue		Layout Plan		Existing pipe line survey	Topo. Soil Survey	Mobilization of Social Survey
7 Dec.	Wed		Organization User, Meter Survey	Water Source Survey	Network Analysis	Cost Survey (N.Amsterdam)	Water Quality Survey
8 Dec.	Thu		N. Amsterdam - G'town				
9 Dec.	Fri		Prep. Interim Report				
10 Dec.	Sat		Ministry of Agriculture				
11 Dec.	Sun		Soil data collection				
12 Dec.	Mon		G'town - N. Amsterdam	N. Amsterdam - G'town	Design Calculation	N. Amsterdam - G'town	Social Survey, Iron Bacteria Test and supplemental data collection
13 Dec.	Tue		Explanation to Div.5	Pumping test analysis	N. Amsterdam - G'town	Cost Survey (G'-town)	
14 Dec.	Wed		N. Amsterdam - G'town				
15 Dec.	Thu						
16 Dec.	Fri						
17 Dec.	Sat						
18 Dec.	Sun						
19 Dec.	Mon		Report to M/T, MFTIC and MHW, Signing Technical Notes				N. Amsterdam - G'town
20 Dec.	Tue		Report to EOJ		Georgetown -		
21 Dec.	Wed		Port of Spain - Houston		- New York -		
22 Dec.	Thu		Houston -		- Tokyo		
23 Dec.	Fri		- Tokyo				

EOJ: Embassy of Japan MFTIC: Ministry of Foreign Trade and International Cooperation MHW: Ministry of Housing and Water
 GWI: Guyana Water Incorporated
 M/D: Minutes of Discussions CP: Counterpart

Explanation of the Draft Report

Date		JICA Official	Consultants
		Mr. NAKAMURA	Mr. TAKECHI and MR. SATO
18-Mar	Sun		Tokyo-New York
19-Mar	Mon		New York - Georgetown 14:45 (BW425)
20-Mar	Tue		9:00 Explanation of Draft Report to GWI 14:00 Submission of Draft Report to MHW
21-Mar	Wed	Washington D.C. 10:00 - Miami 12:37 (AA1965) 13:40 - Georgetown 20:05 (BW431)	9:00 Supplemental explanation of Draft Report
22-Mar	Thu	9:00 Courtesy call to MFTIC 10:00 Courtesy call to MHW 11:00 Courtesy call to GWI Chairman 13:00 Discussion on M/D	
23-Mar	Fri	8:30 Discussion on M/D 10:00 Signing of M/D 14:00 Courtesy call to DFID 15:00 Courtesy call to MF 16:00 Courtesy call to IDB	
24-Mar	Sat	Georgetown 11:30 - Port of Spain 12:35 (BW618) 15:30 Courtesy call to EOJ	
25-Mar	Sun	Port of Spain 9:02 - Miami 12:02 (AA1818) 13:35 - Washington D.C. 15:59 (AA1370)	Porto of Spain 9:02 - Miami 12:02 (AA1818) 13:25 - New York 16:14 (AA1550)
26-Mar	Mon		New York -
27-Mar	Tue		- Tokyo

EOJ: Embassy of Japan

MFTIC: Ministry of Foreign Trade and International Cooperation, MHW: Ministry of Housing and Water

MF: Ministry of Finance, IDB: Inter-American Development bank, DFID: Department for International Development

GW: Guyana Water Incorporated

M/D: Minutes of Discussions CP: Counterpart