

# **TA4270-FIJ – CAPACITY BUILDING IN WATER AND SEWERAGE SERVICES**

## **Final report**

Volume 1 - Main report

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**24 October 2007**

EEG501-FR-001-Rev. 0

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#### Revision History

Revision	Date	Comment	Signatures		
			Originated by	Checked by	Authorised by
0	24/10/2007	Issue to Client	CC	RDH	CAS

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Volume 5 – Environmental Management  
Volume 6 – Occupational Health and Safety  
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# 1 Introduction

## 1.1 OVERVIEW OF TA 4270

Technical Assistance (TA) 4270 began in February 2005 for the purpose of assisting the newly designated semi-autonomous service provider, the Fiji Water and Sewerage Department (WSD), to build institutional capacity in the following key areas:

- trade waste
- community education and awareness
- customer relations and public relations
- environmental management
- occupational health and safety
- and to conduct a tariff review for water supply and sewerage services under the reformed institution.

The TA had an expected completion date for field work on 30 January 2006, in the context of a major ADB-funded investment program to upgrade water supply and sewerage infrastructure in the Suva-Nausori region, following completion of a similar upgrade project (water supply only) in the Nadi-Lautoka region funded by JBIC. The TA has been working very closely with the PMU Reform Project team since that project mobilised in June 2005. The PMU reform team focussed on assisting the transition of the Department into a Commercial Statutory Authority.

Specific TA outputs listed in the Terms of Reference (TOR) were:

- a trade waste program to be incorporated within the loan program
- a community awareness and education program to be incorporated within various media including school curricula
- a health and safety system for WSD and Water Supply Corporation (WSC) to be incorporated within organisational operating procedures
- environmental legislation and regulations for final consideration for passage
- restructured water and sewerage tariffs for consideration for approval
- enhanced capacity of WSD/WSC staff.

The TA has prepared comprehensive groundwork in all areas of capacity building with which the TA is concerned, including analysis of needs, detailed review of relevant legislation, development of appropriate policies, procedures, and (where applicable) administrative manuals and has conducted numerous familiarisation workshops and one-on-one consultations with WSD management and other

government stakeholders (especially the Department of Environment, the Ministry of Public Enterprise, the Ministry of Health, the Ministry of Town and Country Planning, and various town councils) on these and has conducted initial training activities. The TA has prepared detailed job descriptions for all required new positions, and has largely secured formal acceptance and endorsement of the new capacity requirements, policies, and procedures from WSD management and relevant other government stakeholders<sup>1</sup>. A detailed financial model of the reformed institution has been prepared as the basis of the tariff review component of the TA, and a draft tariff proposal has been prepared for discussion and review (the Tariff Review Component Specialist has been working closely with the PMU Reform Project on this preparation, especially the financial management and the asset management specialists). The trade waste management program has met with the enthusiastic endorsement of large commercial enterprises and industries, and community development organisations have energetically participated in the TA's development and delivery of community awareness programs. Throughout the WSD organisation, down to the 'shop floor', the TA activities have met with a highly supportive, enthusiastic response.

The PMU Reform Project, in close liaison with the TA, has made considerable progress in defining the shape of the organisation that will take shape, and has put into train (through the Public Service Commission) the procedures required for recruitment of new positions (many of which were specified by the TA).

An extension of TA 4270 to June 2006 was prepared and endorsed by the ADB and the Government to allow the team to undertake orientation and initial training activities and to assist the PMU Reform Project to address outstanding issues. Finalisation of the tariff submission was extended to October 2007 as an independent activity, still under this TA.

## **1.2 STRUCTURE OF THE REPORT**

This report is presented in seven volumes: a main report (this volume) and six appendix volumes, one for each of the TA component areas which are as follows:

- Volume 1: Main Final Report (This volume)
- Volume 2: Trade Waste Final Report
- Volume 3: Community Education and Awareness Final Report
- Volume 4: Customer Relations and Public Relations Final Report
- Volume 5: Environmental Management Final Report
- Volume 6: Occupational Health and Safety Final Report
- Volume 7: Tariff Review Final Report

The main report contains a summary of the work accomplished and the status of each component which will enable readers to gain a comprehensive overview in one volume of the TA as a whole. The appendix volumes contain the detailed analysis

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<sup>1</sup> Formal endorsement of OHS procedures has not yet been relayed to the team, but review of this within WSD is ongoing and endorsement is expected in January.

and a complete set of the documentation relevant to each component. The summary report for each component is reprinted in the respective appendix volumes, to enable a reader mainly interested in one particular component to find all required information in one volume.

### **1.3 IMMEDIATE FOLLOW-ON ACTIVITIES: DECEMBER 2005**

Members of the TA team responsible for the Community Education and Awareness Programme (CEAP) and the trade waste management program re-visited Fiji after their previous field visits which ended in October, to follow up ongoing activities related to their respective areas. Important results came out of these visits. Although they fall beyond the close –off date of the Final Report and are not included in the respective volume reports, they are sufficiently significant to warrant summary inclusion here.

#### **CEAP**

The CEAP team member supervised a launch of information materials with target groups but could not complete the full launch as planned in October, as some of the printed materials had not yet been produced by the commercial printing company. Arrangements were made to complete the launch of the remaining materials in January 2006.

#### **Trade waste**

The trade waste specialists provided an additional input over the period of 3–11 December 2005.

The purpose of this input was as follows:

- to work further with WSD and the local consultant to develop a framework for continuing the implementation of the trade waste program within the country
- to clarify the roles and objectives of the trial implementation of the trade waste management system in the Western Division
- to provide feedback on the progress of resourcing of the functions developed under TA 4270.

Meetings were held with senior WSD staff on 5 December. All members of the management team expressed their commitment to the trade waste component, and other sections of the TA, but voiced concern about the slow pace of processes with the Public Service Commission (PSC) for the recruitment of new positions. Another proposal had been put forward to the PSC to provide for a senior asset engineer and a trade waste resource as part of the capital expenditure under the Suva-Nausori scheme, but no feedback has so far been received.

A further meeting was held with the Manager of the National Water Quality Laboratory to ensure that WSD staff are sampling industry at the correct sampling points and now taking composite samples.

Meetings were held with the following prospective trade waste companies in the Suva-Nausori area:

- Fletcher's Steel

- Golden Ocean Seafoods
- Rewa Dairy
- Fiji Meats and Tannery
- Fiji Institute of Technology.

Two companies, Fletcher's Steel and Golden Ocean Seafoods, agreed to assist by formally applying for a trade waste permission. This was particularly pleasing as Fletcher's Steel did not discharge to sewer, even though they are within a gazetted sewerage area in the Walu Bay industrial area. The company is eager to connect to sewer and once connected, this provides an excellent opportunity to showcase the introduction of WSD's Trade Waste Policy and the strategy suggested to the Department of Environment of having properties in seweraged areas connect to sewer rather than having a permit under the Environment Management Act. As Fletcher's is keen to publicise their environmental achievements, their connection to sewer and trade waste permit negotiation will make excellent publicity for both the company and the Government of Fiji.

A workshop was convened with the Senior Engineer, Sewerage in the Western Division on 9 December 2005 to determine the best approach to proceed with a trial to test the trade waste management system process, application forms and provisional permit process.

It was agreed that a trial would commence in mid-January 2006 as follows:

- WSD letter informing significant customers of the Trade Waste Policy and the requirement to have a contract to discharge to sewer. The letter will also mention that WSD staff will soon contact the company to commence discussions.
- The TA local consultant and WSD sewerage system supervisors to meet with companies and explain the need for applying for permission to discharge trade wastewater to sewer. The companies will then be given assistance to fill out the required form, and ultimately be issued with a provisional permit that will require that they sample and analyse their trade wastewater.

It was agreed that Alan Griffiths and Andrew Kirkwood will supervise the trial and provide technical assistance where required. The work was scheduled to commence in mid-January 2006 and proceed throughout February 2006.

As part of the TA, an implementation plan has been presented to the Department of Environment outlining the resourcing requirements and management framework for administering Part 5 of the Environment Management Act (2005).

As part of the overall management of waste within the country, WSD needs to be closely involved in the development of liquid waste management strategies across the country, both from the perspective of being a major contributor to the environment and as a supplier of an alternative liquid waste disposal service to industry.

#### **1.4 OVERVIEW OF 2006 EXTENSION ACTIVITIES**

TA extension activities for 2006 were planned to coincide with recruitment of personnel needed to implement the new capacity that has been developed under the



TA through 2005. As mentioned above, a formal submission to the PSC has been made seeking formal approval of the positions so that recruitment can proceed. Though no formal approval has so far been obtained, the WSD had hoped to accomplish all recruitment by April 2006. There are increasing concerns within the WSD, however, over the apparent slow pace of the approval process.

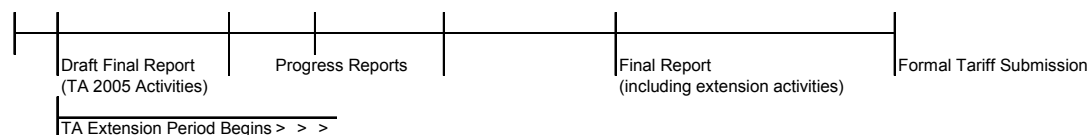
As no full re-mobilisation of the TA team is planned before the recruitments are accomplished, the timing of personnel inputs for the extension is tentative and contingent. Once the new recruits are in place, however, the full TA team will return to Fiji, with a substantial supporting input from local consultants, to provide technical consultation and orientation of the recruits to their functions, and initial on-the-job training. The full extension activities are detailed for each of the TA component areas in this volume and in the appendix volumes.

A tentative personnel schedule for the extension activities is provided in Figure 1.1. This will be regularly updated in response to relevant developments in the WSD.

Due to circumstances in Fiji, staff recruitments did not undertake at that time and the extension activities were not updated.

TA 42760-FIJ 2006 EXTENSION: TENTATIVE PERSONNEL SCHEDULE (as of December 2005)

NAME AND POSITION	FIRM	December	January	February	March	April	May	June	July	August	September	October	November	December	January	MONTHS INPUT		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	FIELD	HOME	TOTAL
INTERNATIONAL																		
Cheatham, Christopher <i>Team Leader/Financial Management Specialist</i>	KBR																1.0000	1.0000
Shaw, Lea <i>Community Awareness Specialist</i>	KBR																1.2500	1.2500
Watling, Richard <i>Environmental Management/Legislation Advisor</i>	KBR																1.0000	1.0000
Kirkwood, Andrew <i>Trade Waste Specialist</i>	KBR																1.0000	1.0000
Rodrigues, Evelyn <i>Public Relations Specialist</i>	KBR																1.5000	1.5000
Pickles, Simon <i>Health &amp; Safety Specialist</i>	KBR																1.2500	1.2500
SUB-TOTAL																7.0000	-	7.0000
DOMESTIC																		
Mirti, Anumitra <i>Poverty Specialist</i>	KBR																2.0000	2.0000
Deo, Seema <i>Public Relations Specialist</i>	KBR																3.0000	3.0000
Korovulavula, Isoa <i>Environmental Management Specialist</i>	KBR																3.0000	3.0000
Thaman, Batiri <i>Environmental Engineer</i>	KBR																3.0000	3.0000
SUB-TOTAL																11.0000	-	11.0000
TOTAL																18.0000	-	18.0000



Legend:  
Field, Full  
Field, Part

Figure 1.1  
Tentative personnel schedule

# 2 Trade waste

## 2.1 REPORT OBJECTIVE

As part of the capacity building requirements of TA 4270, a system for managing trade waste dischargers to the sewerage system has been developed for the Fiji Water and Sewerage Department (WSD).

The purpose of this report is to:

- demonstrate the progress made in fulfilling the terms of reference required in the TA
- discuss the deliverables and what benefits they will bring to WSD
- provide WSD and the associated parties a four year plan for the implementation of a sustainable trade waste management system.

This final report assumes that:

- the reforms within WSD will occur
- interim staffing arrangements will be approved by the PSC.

There are a number of ongoing activities that will be required to finalise the trade waste management system and ensure a smooth implementation. These activities could not be completed due to WSD counterpart staff not being in place, and the later than anticipated endorsement of the trade waste policy by WSD. These activities have been included within the proposed implementation timetable.

## 2.2 PROGRESS TO FULFILLING TOR REQUIREMENTS

The initial terms of reference listed eight specific outcomes of the trade waste component:

- in discussion with the Government and industry develop a trade waste (industrial wastewater) management program
- inventory of/industrial discharges to the wastewater system, analyse these discharges, and assess the pre-treatment being provided, if any
- determine appropriate pollutant loading for discharge to the municipal system
- develop appropriate pre-treatment requirements
- develop a proposed trade waste discharge permit program, including monitoring and enforcement systems
- assist others to prepare a trade waste sewerage program, with costs and an implementation program

- assess the impacts, costs and benefits of the program recommended
- assist the tariff study in the determination of appropriate discharge fees.

The Table 2.1 demonstrates progress against these outcomes.

## 2.3 DELIVERABLES

As outlined in the Inception Report, the requirements of the TOR were met by considering nine areas of technical analysis. A further area was included based on additional needs identified at the interim report phase. These areas of technical analysis were completed and the reports included in the trade waste management system documentation as a comprehensive report in order that the rationale and context of the policy, management plans and standard correspondence can be researched by WSD staff not involved in the development of the program. This comprehensive report also has attached to it appendices which include the tools developed as part of the TA. A summary of progress in each area is provided in Table 2.2.

Significantly, endorsement by WSD of the fundamental policy building blocks has been strong.

The adoption and implementation of a trade waste management system by WSD will ensure the following:

- a greater understanding of the quality parameters involved in accepting wastewater to sewer
- a preventative program to manage existing sewerage assets
- a greater understanding of the true environmental impacts of wastewater
- an effective program to encourage resource utilisation within the non-residential sector
- a clear direction for industry in setting up business and complying with WSD requirements
- a mechanism to comply with components of the Sewerage Act.

The following table details the activities undertaken and completed in the technical analysis including tools developed.

**Table 2.1 Progress to fulfilling terms of reference requirements**

TOR	Level of achievement	Outcomes	Challenges
In discussion with the Government and industry develop a trade waste (industrial wastewater) management program	Complete.	Trade Waste Policy (Volume 2 –Appendix 4 and Section 10) Commercial Customer Management Plan Significant (Industrial) Customer Management Plan Implementation Plan (Volume 2 – Section 12)	WSD unable to appoint staff with trade waste responsibility until at least March 2006.
Inventory of industrial discharges to the wastewater system, analyse these discharges, and assess the pre-treatment being provided, if any	Complete	Inventory of commercial and significant customers for each gazetted sewerage catchment incorporated into interim report Analytical data on each significant discharger obtained Site inspection of each significant discharger assessed and reported on level of pre-treatment (Volume 2 – Section 4)	Limited number of analytical laboratories in country meant that turnaround time on results was lengthy. Difficult to assess volumes discharged from significant customer sites. Only two significant customers had discharge meters.
Determine appropriate pollutant loading for discharge to the municipal system	Complete	Acceptance standards in the Trade Waste Policy and the significant customer management plan developed to reflect current capacity requirements of sewage treatment plants. Significant customers with wastewater not meeting proposed standards advised of need to review operations during site inspections	New dischargers being notified of WSD requirements within environmental impact assessment and development assessment processes at local government level.
Develop appropriate pre-treatment requirements	Complete	Standard pre-treatment designs for grease arrestors, cooling/dilution pits and oil/water separators for use by commercial customers submitted to WSD for endorsement and included in standard sewer design drawings (Volume 2 – Appendix 14) Significant Customer Plan compliance by output parameters measured by compliance with acceptance standards	Availability of standard pre-treatment in country. No trade waste function currently within WSD.

TOR	Level of achievement	Outcomes	Challenges
Develop a proposed trade waste discharge permit program, including monitoring and enforcement systems	Complete	<p>Site audit inspection template</p> <p>Commercial customer application form</p> <p>Significant customer application form</p> <p>Commercial customer provisional permit</p> <p>Significant customer provisional permit</p> <p>Commercial customer permit and general conditions</p> <p>Significant customer contract and general conditions</p> <p>Standard correspondence for breach management (17 documents) (Appendices 6-13,17,18 in TWS Doc)</p>	<p>No trade waste function currently within WSD.</p> <p>Need to revisit local government and Department of Environment to reconfirm notification procedures for new developments.</p>
Assist others to prepare a trade waste sewerage program, with costs and an implementation program	Complete	<p>Installation of telemetry for monitoring of overflows, hydrogen sulphide and lower explosive limit at sewage pumping stations in industrial areas</p> <p>Upgrade of Wailada sewage treatment plant to cope with proposed discharges from industry as a result of the requirements of the environment Management Act (2005)</p>	<p>Capital expenditure for telemetry upgrade.</p> <p>Maintenance and calibration of monitoring equipment.</p>
Assess the impacts, costs and benefits of the program recommended	Complete	<p>Cost of establishment and ongoing operation of program and trade waste program included in interim report (Section 8 of TWS Doc).</p> <p>Cost of trade waste sewerage program incorporated into tariff review</p>	<p>Capital expenditure for telemetry upgrade.</p> <p>Maintenance and calibration of monitoring equipment.</p>
Assist the tariff study in the determination of appropriate discharge fees	Complete	<p>Schedule of rates included in Trade Waste Policy and management plans to cover the cost of an effectively resourced trade waste unit</p> <p>Charging scenarios developed for charging significant customers for over strength waste (Section 9 of TWS Doc)</p>	<p>No trade waste function currently within WSD.</p> <p>Acceptance of tariff study by WSD and the Government of Fiji.</p>

**Table 2.2 Activities undertaken and completed in the technical analysis**

Area of technical analysis	Lead	Support	Outcomes	Anticipated completion date	Actual completion date	Comments
1. Legislative issues associated with implementing a trade waste program	Andrew Kirkwood	Dick Watling Batiri Thaman	1. Review of the Sewerage (Amendment) Act 1974 to determine WSD's ability to support a trade waste management function	Mar-05	Mar-05	Completed. Incorporated into capability study.
			2. Review of the Environment Management Act 2004 to determine how the enactment of this Act will affect the manner in which industrial wastewater is managed within Fiji	Mar-05	Mar-05	Completed. Incorporated into capability study.
			3. Review of the Public Health Act 2004 to determine how the enactment of this Act will impact on WSD's ability to manage trade waste issues on customer sites	Mar-05	Mar-05	Completed. Incorporated into capability study.
2. Operational issues that determine the drivers for a trade waste program	Batiri Thaman	Andrew Kirkwood	1. Review operation of sewage treatment plants to determine the current impact of trade waste discharges on plant efficiency, effluent quality and sludge disposal options	Mar-05	Mar-05	Completed. Incorporated into capability study.
			2. Review operation of sewerage network to determine the current impact of trade waste discharges on routine maintenance, system breakdowns and blockages, proactive maintenance and system corrosion	Mar-05	Mar-05	Completed. Incorporated into capability study.

Area of technical analysis	Lead	Support	Outcomes	Anticipated completion date	Actual completion date	Comments
3. Customer issues that determine the scope of a trade waste management program	Batiri Thaman	Andrew Kirkwood	1. Determine the extent of the current non-residential customer base discharging to sewer	Apr-05	Jul-05	Completed. Incorporated into capability study.
			2. Determine the business sector's resistance to change that will develop from WSD managing trade waste	Apr-05	Jun-05	Completed. Incorporated into capability study.
			3. Audit of industrial trade waste customer base to determine current pollutant masses and its relation to total mass received at sewage treatment plants	May-05	Jul-05	Completed. Incorporated into capability study.
			4. Audit of commercial trade waste customer base and level of pre-treatment	May-05	Jul-05	Completed. Incorporated into capability study.
			5. Develop estimate of potential trade waste customer base based on augmentation of sewerage network and impacts of environmental and public health legislation	May-05	Jul-05	Completed. Incorporated into capability study.
4. Development of a trade waste policy and guidelines for acceptance of trade wastewater to sewer	Andrew Kirkwood	Batiri Thaman WSD Counterpart	1. Develop a definition of trade waste that encapsulates all industrial and commercial discharges to the sewerage system	May-05	May-05	October 05 – endorsed by WSD.
			2. Revise current WSD trade waste acceptance standards in line with current international standards	May-05	Jun-05	October 05 – endorsed by WSD.
			3. Development of trade waste policy document	Jun-05	Jun-05	October 05 – endorsed by WSD.
			4. Development of commercial customer management plan	Jul-05	Jun-05	October 05 – endorsed by WSD.
			5. Development of industrial customer management plan	Jul-05	Jun-05	October 05 – endorsed by WSD.
			6. Determination of breach procedures	Aug-05	Oct-05	Included in permit/contract documents.
			7. Development of operational support procedures	Aug-05	Oct-05	Included in permit/contract documents.



Area of technical analysis	Lead	Support	Outcomes	Anticipated completion date	Actual completion date	Comments
5. Development of a trade waste permit format	Batiri Thaman	Andrew Kirkwood Dick Watling	8. Development of pollution notification procedures	Sep-05	Oct-05	Included in permit/contract documents.
			9. Development of relationship with local government and Department responsible for the Environment to incorporate trade waste issues in Environmental Impact Assessment	Oct-05		19 May- initial meeting held with head of Department of Environment.  16 June – met with Jacqueline Hughes, Department of Town and Country Planning.  October – to be incorporated into implementation plan in March 2006.
			1. Development of forms of application for customers applying to discharge trade waste	Jun-05	Jul-05	Completed – included in trade waste management system standard documentation.
			2. Determination of appropriate medium to apply for a trade waste permit	Jun-05	Jul-05	Completed – included in inception report.
			3. Development of contract documentation for industrial customers permitted to discharge trade waste	Jul-05	Jul-05	Completed – included in inception report.
			4. Development of a simple permit document for commercial customers	Jul-05	Jul-05	Completed – included in inception report.

Area of technical analysis	Lead	Support	Outcomes	Anticipated completion date	Actual completion date	Comments
6. Determination of local private sector capacity to support implementation of a trade waste program	Andrew Kirkwood	Batiri Thaman Dick Watling	1. Determine capacity for handling industrial trade waste sludges within the waste transport industry	Mar-05	Mar-05	Complete, incorporated into capability study.
			2. Determine capacity of national consultants in design, manufacture and commissioning of industrial wastewater treatment systems	May-05	Jun-05	Complete, incorporated into capability study.
			3. Determine capacity of national industry for supplying standard commercial trade waste pre-treatment equipment	Jun-05	Jun-05	Complete, incorporated into capability study.
			4. Determine capacity of national plumbing industry to install trade waste pre-treatment equipment	Jul-05	Jun-05	Complete, incorporated into capability study.
7. Establishment of a trade waste function within WSD	Andrew Kirkwood	Batiri Thaman WSD Counterpart	1. Determine focus of trade waste management capability and most suitable functional silo for trade waste function	Jul-05	Jul-05	Complete, incorporated into capability study.
			2. Determine skill set required for trade waste function	Jul-05	Jul-05	Included in position descriptions.
			3. Determine structure of the Trade Waste Unit	Sep-05	Jul-05	Complete, incorporated into capability study.
			4. Develop position descriptions for roles within unit	Sep-05	Jul-05	Complete, incorporated into capability study.
			5. Determine training requirements for staff in unit	Sep-05	Jul-05	Complete, incorporated into capability study.
			6. Assist, if required, in recruitment of Unit Leader	Oct-05		Could not be completed due to PSC not making a decision on resourcing.
			7. Determine KPI's to gauge unit effectiveness	Oct-05	Jul-05	Complete, incorporated into capability study.

Area of technical analysis	Lead	Support	Outcomes	Anticipated completion date	Actual completion date	Comments
8. Development of trade waste charging capability	Chris Cheatham	Andrew Kirkwood Batiri Thaman WSD Counterpart	1. Determine the variable cost component of a pricing path related to the current network and treatment costs associated with accepting trade waste discharges to sewer	Oct-05	Oct-05	Complete – included in final report and capability study.
			2. Determine the fixed cost component of a pricing path related to the operating costs of a trade waste function within WSD	Oct-05	Jul-05	Completed – included in capability study and trade waste policy documentation.
			3. Develop scenarios for recovering the costs of over-strength industrial wastes	Oct-05	Oct-05	Completed, incorporated into final report and capability study.
			4. Develop a total pricing package based on cost recovery principles	Oct-05	Oct-05	Completed, incorporated into final report and capability study.
			5. Develop a functional requirement specification to cater for trade waste charging in current WSD acting system	Oct-05	Oct-05	Completed, incorporated into capability study.

Area of technical analysis	Lead	Support	Outcomes	Anticipated completion date	Actual completion date	Comments
9. Consultation with stakeholders	Batiri Thaman	Andrew Kirkwood	1. Commence dialogue with individual significant dischargers regarding trade waste issues	Mar-05	Jun-05	Complete, incorporated into capability study.
			2. Consult with Chamber of Commerce and other retail organisations	Apr-05	Jun-05	23 May 05-Met with TPAF, will organise a business environment forum meeting in June focusing on trade waste/EMA issues. July 05 – incorporated into proposed trade waste reference group.
			3. Liaise with Department of Environment, Ministry of Health and Town Councils on formulation of trade waste policy	May-05	Jun-05	Complete, incorporated into capability study.
			4. Develop a Business Customer Forum to provide opportunities for WSD to gain feedback from industry on policy and pricing development	Oct-05		1.23 May 05-Met with TPAF, will organise a business environment forum meeting in June focussing on trade waste/EMA issues  2. Presented concept of trade waste reference group to WSD Senior Management 23 June 05 to be convened as the trade waste reference group when implementation commences in March 06
10. Items identified during interim phase	Andrew Kirkwood	Batiri Thaman	1. Development of standard commercial pretreatment designs	Oct-05	Oct-05	Completed, submitted to PWD drafting section 21 October-05.
			2. Development of interim fee collection system	Oct-05		To be finalised as part of

Area of technical analysis	Lead	Support	Outcomes	Anticipated completion date	Actual completion date	Comments
						trial in November 05 – January 06.
			3.Development of specification for Trade Waste IT solution	Oct-05	Oct-05	Completed, included into capability study.
			4.Development of standard letters	Oct-05	Oct-05	Completed, included in Trade Waste Management System standard documentation.
			5. Development of site inspection templates	Oct-05	Oct-05	Completed, included in trade waste management system standard documentation.

### 2.3.1 Legislative issues

The key pieces of legislation reviewed were:

- the Sewerage (Amendment) Act 1974
- the Environment Management Act 2004
- the Public Health Bill 2004.

Recommendations were:

- that WSD develop a management system that incorporates a liquid trade waste acceptance service to sewer utilising existing powers under the Sewerage (Amendment) Act 1974
- that the following provisions pertinent to trade waste management be included as an amendment to the current Act, and incorporated into any proposed Water Corporatisation Bill:
  - inclusion under Section 2.5 of the Act for the ability of WSD to enter sites for the purposes of inspecting and monitoring actual or potential discharges to its sewerage system
  - inclusion of a by-law specific to trade waste that states that...the regulation and acceptance of liquid trade wastewater to the sewerage system is subject to the provisions of WSD'S published 'liquid trade wastewater acceptance policy and guidelines'
  - inclusion of a clause under section 14 of the Act noting that it is an offence to discharge either domestic or trade waste to a work of the WSD without its written permission
  - having 'trade waste' included in definitions under the Act
  - inclusion of disconnection as a potential penalty for failure to comply with provisions of the Act, particularly sections 5 and 14. The preferred mode of disconnection for a trade waste discharger should be disconnection of the water supply servicing the property. This is to ensure that the discharger does not simply divert their flow from the sewerage system to the stormwater or environment and thus cause a pollution incident. This would also require an amendment to Section 8 of the Water Supply Act (1955).
- that WSD be responsible for all aspects of the trade waste management program, including the receipt, review and monitoring of trade waste permits and other contracted arrangements covering the discharge of liquid trade waste to sewer
- that cooperative arrangements be in place between Local Government in sewerage areas, the department responsible for the Environment and WSD to facilitate:
  - the review of trade waste generating processes and proposed pre-treatment by WSD for developments considering discharge to sewer as part of the EIA process

- the requirement to apply to WSD for a trade waste permit be part of the development compliance checks performed by Local Government when giving business approval to commence operation
- a joint inspection program in sewer industrial areas to provide a coordinated approach to industry when implementing WSD'S Trade Waste Program and the proposed Environment Management Act.

### **2.3.2 Operational issues**

Information on the operational issues of WSD Treatment Plants and sewer networks relevant to the development of a trade waste management system was obtained through a review of past studies, consultations with personnel in WSD and field visits. The key field visits conducted were:

- inspection of Kinoya and Wailada sewage treatment plants
- accompanying maintenance crew to view response to sewer blockages
- accompanying laboratory staff on sampling of industrial discharges
- accompanying council environmental health officers during business inspections.

Analysis of data and field inspections confirmed that there are numerous operational issues emanating from the current receipt of trade waste in its uncontrolled and unregulated manner. The key issues are:

- excessive grease build up and blockages in commercial business districts caused by commercial premises discharging trade waste without pre-treatment
- excessive grease build up causing blockages in pumping stations in industrial areas caused by industrial premises with poor or non-existent trade waste pre-treatment
- evidence of petroleum hydrocarbons in the wet wells of pumping stations in industrial areas. This is a major problem as it dramatically increases the risk of explosion in the pumping station, particularly if the wiring and electrical components within the pumping station is not intrinsically safe
- current industrial dischargers failing to meet current acceptance standards due to inadequate monitoring and enforcement regimes
- high strength wastes creating a corrosive environment within the sewerage network and variable influent quality at STP's
- inadequate controls governing the receipt of tanker-borne wastes at STP's
- uncertainty by WSD regarding which customers are actually connected to the sewerage system. This applies to the whole site, but also in cases where domestic sewage discharges to sewer and trade waste to the environment
- poor systems to capture new developments which may discharge trade waste to sewer.

### 2.3.3 Customer issues

The following activities were undertaken to assess the non-residential trade waste customer base:

- assessment of the extent of commercial customers that discharge trade wastewater into the sewer
- assessment of the extent of commercial customers discharging trade waste into the environment
- audit of the level of pre-treatment of commercial customers
- estimation of potential customers that could be connected to sewer in the future
- assessment of industry effluent and comparison with pollutant masses received at SWTs
- consultations with significant dischargers regarding trade waste issues and determining views on the development of a trade waste policy by WSD.

A number of sources of data were used including information from the town/city councils and the water rates office, visits to individual industry, records from Kinoya NWQL from sampling visits and the yellow pages. The assessment was focussed on the Suva-Nausori corridor which includes the boundaries of Suva, Nasinu and Nausori, and Lami area. Lautoka was also visited.

Nationally the number of commercial customers that would require trade waste permit is between 800–900 and number of significant dischargers is around 34. The enforcement of the EMA regulations and the requirement of industries to redirect trade waste to sewer instead of to the environment and the extension of the sewer network could see this number increase to around 1100 commercial customers and 50 significant dischargers.

Although many commercial customers do have pre-treatment in the form of grease traps most if not all are undersized and thus are not functioning effectively. A revision of the standards for pre-treatment is required by WSD. Around 50% of the significant dischargers currently have the appropriate pre-treatment.

Very few industry undertake their own effluent monitoring and although NWQL does undertake some monitoring of industry effluent they are probably under-resourced at present to undertake continuous and effective monitoring program. Available results of industry effluent quality indicate that many of the larger industries discharging to the sewer, are putting in wastewater that do not satisfy the effluent standards as proposed in the trade waste policy. As a consequence BOD and oil and grease levels in influent at Kinoya STP are high with around 30% of BOD coming from commercial customers.

On the other hand, the industry visits and consultations on the trade waste policy did raise interest amongst industry about their responsibility in managing their trade waste and the resulting impacts on the environment and the sewer system if they didn't. Many industry were willing to introduce pre-treatment and improve their wastewater management and a few requested information be sent to them for specific cases. This interest will not last if no follow up is undertaken or the



implementation of the trade waste policy does not proceed. The confidence of industry in WSD undertaking what they propose will thus diminish.

#### **2.3.4 Development of trade waste policy**

The endorsed WSD liquid trade waste policy and management plans can be found in Volume 2 – Appendix 4. The policy includes customer management plans, acceptance standards and a schedule of fees.

To review the draft trade waste policy and obtain feedback from WSD a half-day workshop was held on 23 June 2005 at Nasilivata House in Samabula. Around 20 WSD staff were present together with members of the TA team and PMU reform team.

The trade waste policy was endorsed by WSD on 11 October 2005.

#### **2.3.5 Regulatory permits**

The Liquid Trade Waste Policy has three customer groupings:

- customers deemed to have permission to discharge to sewer – Some small businesses do not discharge trade waste in sufficient quality and quantity to justify the issuing of a written permit
- customers with commercial processes that require a written permission – Some businesses discharge trade waste in sufficient quantities that they present a difficulty for WSD to transport and treat these wastes unless specific on site pre-treatment is installed by the discharger
- significant dischargers – All dischargers who do not correspond to the first two classifications will be classified as significant dischargers. This includes food manufacturing, production, waste management and transport industries.

The proposed arrangements for customers gaining permission to discharge liquid trade waste to WSD's sewerage system were developed as follows:

- apply for permission – commercial and significant customers will need to apply in writing by completing a form (Volume 2 – Appendix 6 and 7)
- provisional permission – once the applications have been assessed and appears to be acceptable, the customer should be given a provisional permit (Volume 2 – Appendix 8 and 9)
- commercial permit – once the business has installed pre-treatment and is operational, WSD must visit the site and inspect the pre-treatment before issuing a permit. (Volume 2 – Appendix 10 and 11)
- significant customer contract – when the initial sampling program under the provisional permission has been completed there should be sufficient data to negotiate the schedules of the contract. (Volume 2 – Appendix 12 and 13).

In addition, standard letters and site inspection templates were developed and are attached as Volume 2 – Appendix 17 and 18.

### **2.3.6 Local private sector capacity**

There are a number of support agencies pertinent to trade waste management considered to be the crucial from the perspective of providing services coupled with the provision of customer awareness based on their understanding of trade waste issues. These are waste transporters, consulting engineering firms, standard pre-treatment manufacturers, plumbers and laboratories. It will become increasingly important that WSD develop ongoing relationships with these service providers to ensure that they are aware of emerging issues so that end users receive advice consistent with WSD policy.

The local consulting industry is currently not prepared for supporting the full introduction of a trade waste policy. Overall, the industry is waiting for clear signals from government regarding a commitment to implementing environmental and trade waste policies, and once these signals are sent then the local industry will react relatively quickly to these signals. As the commitment of these local support industries is critical to the success of the policy, it may be prudent to develop a staged implementation of the trade waste policy that allows sufficient time for all stakeholders to be prepared to offer their services to trade waste customers.

Therefore a key issue for WSD is to ensure that the trade waste policy is marketed and communicated to the local consulting industry at least six months prior to its implementation. This process should be facilitated through the proposed trade waste reference group as this will involve representatives from these support industry groups and other government institutions.

### **2.3.7 Establishment of a trade waste function**

At present no such function exists within WSD, however a number of sections play a part in attempting to gain some control over trade waste discharge issues. They include:

- sewerage system managers – responsible for day to day operation of sewerage networks and sewage treatment plants
- national water quality laboratory – responsible for provision of waste water quality data
- water rates office – responsible for billing customers
- development enquiries – responsible for providing hydraulic capacity information for new developments.

Given the broad range of duties, it is essential that the team responsible for trade waste management have good access to staff within all functional silos of the organisation as the impact of their activities affects the sewerage system, members of the public and the reputation of the organisation.

Once established, a key responsibility of the trade waste function is quality assurance; therefore it is reasonable to initially establish the function within the National Water Quality section. Based on overseas experience, trade waste functions initially form part of the laboratory or sewage treatment plant group, however as the program matures, the function becomes responsible for the primary interaction with the non-residential customer base. When WSD embark on structural

reform, consideration should be given to ultimately developing a group within the customer service function responsible for interaction with business customers. The trade waste function would fit well within a group such as this. It is predicted that approximately three full-time employees, being one manager of the unit and two inspectors will be required to undertake trade waste activities.

Draft position descriptions and selection criteria were developed and can be found in Volume 2 – Appendix 15 and Volume 2 – Appendix 16 (Trade Waste Inspector).

### **2.3.8 Trade waste charging capability**

The Trade Waste Policy allows for two broad charging components. This allows for a recovery of the cost of operating through fixed charges, and an incentive for significant customers that contribute the highest load of trade waste substances on the sewerage services to manage their waste in a more acceptable manner through variable charges:

- Fixed charges – represented by application fees, permit fees, commercial quality charges and additional inspection fees.
- Variable (over strength) charges – represented by pollutant charges for significant customers. There are only four substances that affect current operations to the extent that additional charges are warranted (BOD, Suspended Solids, oil, grease and sulphate). These charges are designed to provide an incentive for industry to manage their waste to reduce their contribution to the sewerage system. Based on existing data, some customers will face over strength charges in excess of \$100,000 per annum. Therefore, it is proposed that this variable component of the charging not be introduced for a period of two years to enable industry to utilise funds to manage and treat their wastewater to a level that reduces their impact on the sewerage system.

### **2.3.9 Stakeholder consultations**

Around 35 industries were visited during the duration of the TA. Reasons for visits were to obtain information on which industries were connected to sewer, what types of trade waste was being produced and to provide awareness on the proposed trade waste policy and the requirements of industry.

Five local councils were consulted: Suva City Council, Lami Town Council, Nasinu Town Council, Nausori Town Council and Lautoka. Reasons for consultations were:

- to obtain information on number of significant industries within their jurisdictions were connected to sewer and which discharged trade waste to sewer
- to obtain information on number of commercial customers and extent of pre-treatment
- discuss the present arrangement of approval of new industrial developments and connections to sewer
- discuss procedure for annual inspections and powers of entry to industry
- discuss proposed trade waste policy and involvement of councils in its implementation.

Two relevant government departments outside PWD, Department of Environment and Department of Town and Country Planning were consulted in order to better understand the present procedure for development approvals and connections to sewer and to discuss the proposed policy and its implementation.

Throughout the project, various personnel from WSD from a number of different sections were consulted and also assisted the trade waste team in a number of areas including the National Water Quality Laboratory, Kinoya Sewage Treatment Plant, WSD Headquarters, choke crew, Water Rates Office and Western Division.

The following stakeholder consultations are required prior to implementation of the policy.

- set up of a reference group lead by WSD staff. The role of this group would be to have further consultation on the policy with stakeholders involved in its implementation and discuss framework for implementation
- holding a business forum for industries to provide awareness on the trade waste policy and implications for industry.

## 2.4 IMPLEMENTATION TIMETABLE

In order for the trade waste program to be established, a number of key activities must occur over the next three years. When TA 4270 commenced, it was assumed that corporate commitment had been obtained for the development of the program, however the proposed trade waste policy presented to WSD in July 2005, was only endorsed in October 2005. This has meant that it was not possible to commence a number of the activities planned under the TA, particularly in regard to delivering training of WSD staff and information sessions for industry.

This change will necessitate the employing of a technical resource to continue the development work required for the program.

The tables below represent the timetable for the trade waste program. The activities are defined in greater detail at the end of each calendar year table.

**Table 2.3 2005**

Date	Activity	Responsibility
November	Trial trade waste management system	WSD/TA 4270

### Activity statements

*Trial trade waste management system* – The endorsed system should be trialled on a suite of existing significant dischargers in order that the proposed processes can be evaluated prior to implementation with a full staffing complement. As a number of trade waste issues have been resolved in the Western Division, it is proposed that the trial be based there with 10 existing significant dischargers. The trial team will be comprised of:

- Allan Griffiths – Divisional Sewerage Engineer
- Sher Singh – Manager, National Water Quality Control Laboratory

- Batiri Thaman – TA 4270
- Andrew Kirkwood – TA 4270

The team will trial the process of application, assessment and negotiation of significant contracts, and supervise the change from ‘discrete’ sampling to ‘composite’ sampling and determination of mass of substances discharged. As there is currently no formal delegation to manage the Trade Waste Unit, it is recommended that Allan Griffiths assume the responsibility for the role for the trial. It is expected that the trial should proceed for a period of four months to thoroughly evaluate all possible scenarios encountered in normal operations.

**Table 2.4 2006**

Date	Activity	Responsibility
November	Trial trade waste management system	WSD/TA 4270
March	Appoint interim trade waste staff	WSD/PMU reforms
	Confirm reporting lines	WSD/PMU reforms
	Determine administrative procedures	Technical resource/WSD
	Conduct training for WSD staff	Technical resource/WSD
	Develop Significant Customer quality charges	Technical resource/WSD
April	Conduct public briefings	Technical resource/WSD
	Convene meeting of Trade Waste Reference Group	Technical resource/WSD
May	Confirm arrangements with councils regarding new developments	Technical resource/WSD
	Confirm EIA arrangements with Department of Environment and Department of Town and Country Planning	Technical resource/WSD
June	Commence training of trade waste staff through partnering arrangement with kindred water authority	Kindred Water Authority/WSD
July	Overseas trade waste specialist from kindred water authority assists with implementation	Kindred Water Authority/WSD
	Commence negotiating with existing significant dischargers	WSD
	Commence new customer program through Development Assessment requirements with local councils	WSD
	Introduce application, permit, contract and inspection fees, failure to install commercial pre-treatment and commercial quality charges	WSD
	Monitor and invoice existing dischargers	WSD

#### Activity statements

*Appoint interim trade waste staff* – As permanent staff will not be in place until the reform is further progressed, WSD has proposed developing an interim position as a ‘Trade Waste Advisor’. This position would be filled on a term basis. It is anticipated that the necessary approvals and appointment will occur by March 2006.

**Table 2.5 2006**

Date	Activity	Responsibility
March	Appoint interim trade waste staff	WSD/PMU reforms
	Confirm reporting lines	WSD/PMU reforms
	Determine administrative procedures	Technical resource/WSD
	Conduct training for WSD staff	Technical resource/WSD
	Develop significant customer quality charges	Technical resource/WSD
April	Conduct public briefings	Technical resource/WSD
	Convene meeting of trade waste reference group	Technical resource/WSD
May	Confirm arrangements with councils regarding new developments	Technical resource/WSD
	Confirm EIA arrangements with Department of Environment and Department of Town and Country Planning	Technical resource/WSD
June	Commence training of trade waste staff through partnering arrangement with kindred water authority	Kindred Water Authority/WSD
July	Overseas trade waste specialist from kindred water authority assists with implementation	Kindred Water Authority/WSD
	Commence negotiating with existing significant dischargers	WSD
	Commence new customer program through development assessment requirements with local councils	WSD
	Introduce application, permit, contract and inspection fees, failure to install commercial pre-treatment and commercial quality charges	WSD
	Monitor and invoice existing dischargers	WSD

*Confirm reporting lines* – The trade waste unit will ultimately be within the customer service function, however the majority of interactions in the initial stages will be with the National Water Quality Laboratory staff and the Sewerage Network Managers. This relationship will need formalising prior to activity commencing.

*Determine administrative procedures* – The Trade Waste Policy and Management Plan outlines the process of approval and monitoring, however further work is required to develop a consistent administrative system to ensure that applications are processed promptly and consistently, and fees are collected at appropriate intervals. This work can not proceed until staff are appointed to positions.

*Conduct training for WSD staff* – The Trade Waste Policy has been endorsed; however it will be essential to conduct a training workshop with all WSD staff that will have input to managing trade waste issues. This training will cover the policy and management plans, as well as the administrative procedures and reporting lines that will be developed. This could be covered in a three-day workshop held in a central location that includes staff from all divisions. This training will be a key part of WSD assuming ownership and responsibility for the policy and its implementation.

*Develop significant customer quality charges* – TA 4270 has recommended that these charges be introduced two years after implementation of the policy. This is to give significant customers an opportunity to commence monitoring their trade waste discharge in accordance with their contract, and determine what effluent improvements may be required. Whilst the charges should not be levied, WSD should indicate to industry the equivalent charges that would be levied if effluent improvements are not made. This approach is designed to demonstrate that WSD are more interested in industry managing their waste rather than just licensing dischargers to pollute. Note: that all other charges will be levied from when customers apply for permission as they are designed to capture the administrative cost of the program.

*Conduct public briefings* – TA 4270 proposed that all known significant customers and industry consultants be invited to attend a public briefing on the Trade Waste Policy prior to its implementation. This would be industry's opportunity to understand the purpose of the policy and how it will be implemented. This was to be held in October 2005; however it should be held at a date close to when the policy implementation occurs. It is proposed that one session be held in Suva, and one held in the Lautoka/Nadi area and invitations be sent to all known significant dischargers. Where they are unable to attend, individual briefings could be held as part of the negotiation with the customer.

*Convene meeting of the Trade Waste Reference Group* – A key part of the awareness campaign for the policy is to develop a reference group that meets quarterly to review the policy and its implementation, and to provide feedback to WSD on how systems can be improved. It is proposed that the reference group contains representatives from the following areas:

- Department of Environment – to provide an interface on managing customers within gazetted sewerage areas but not currently discharging to sewer
- Suva and Lautoka councils – to provide a link with the council's building and development sections
- precast concrete industry – to provide a link with manufacturers of standard pre-treatment
- Fiji Institute of Technology – to provide a link with the plumbing industry
- liquid waste transport industry – to provide a link with the industry that maintains most industrial pre-treatment facilities
- Fiji Chamber of Commerce – to provide a link with the commercial business sector
- University of the South Pacific – to provide a link with analytical laboratories
- significant industries – a representative from two customers
- Environmental Consultant – to provide linkage with the consultants industry

As part of industry consultations under TA 4270, these groups were contacted and the concept was discussed. There was unanimous agreement on its value and all who were contacted agreed to be members of this consultative forum.

The forum should be represented by a senior manager from WSD, the Trade Waste Advisor and any staff who are required to present to the forum. It is anticipated that this group will also be crucial in reviewing arrangements for how liquid waste should be managed throughout the country as proscribed by the Environment Management Act.

*Confirm arrangements with councils regarding new developments* – Consultations with all councils in gazetted sewerage scheme areas raised the issue of WSD being contacted when new industrial and commercial developments were submitted to Council for assessment. This proposal was agreed in principle, however it will need to be confirmed when the program commences.

*Confirm EIA arrangements with Department of Environment and Department of Town and Country Planning* – Consultations with these departments raised the issue of WSD being consulted when new significant developments were submitted for assessment. This would have the added advantage of keeping WSD informed of developments that may require network and treatment upgrades as part of the servicing requirements. This proposal was agreed in principle, however it will need to be confirmed when the program commences.

*Commence training of trade waste staff through partnering arrangement with the Kindred Water Authority* – The interim report recommended that, in the absence of formal trade waste training courses, that training be conducted through a relationship with a water authority with a mature, established trade waste program. The first phase of this training would necessitate the appropriate WSD staff spending three weeks with the trade waste unit of the kindred water authority observing their work practices and gaining knowledge through on the job training.

*Overseas Trade Waste Specialist from Kindred Water Authority assists with implementation* – Upon completion of overseas training, WSD staff is accompanied by a trade waste specialist from the kindred water authority for a period of four weeks to assist with implementation.

*Commence negotiating with existing significant dischargers* – The TA team had briefed the significant dischargers on the development of a policy, these details will be confirmed in the public briefings to be held in April 2006. The customers will be contacted individually and requested to apply for a permit. Once received, the customers should be issued with a provisional permit in order to gather sufficient data to negotiate a significant customer contract. It is anticipated that this process will take up to twelve months and involve significant input from WSD as it will require negotiating wastewater improvement programs with some customers.

*Commence new customer program through development assessment requirements with local councils* – Once arrangements have been confirmed with local councils, WSD should commence the program with all new commercial and significant customers that apply for development consent.

*Introduce application, permit, contract and inspection fees, failure to install commercial pre-treatment and commercial quality charges* – As these charges form the ‘cost recovery’ component of the trade waste program, implementation of these charges should commence as customers apply for permits.



*Monitor and invoice existing dischargers* – As customers apply for permits, systems will need to be in place to ensure that these customers are monitored to ensure compliance with their permit conditions. An IT specification has been developed under TA 4270; however in the absence of an IT solution provisional manual systems will be required.

**Table 2.6     2007**

Date	Activity	Responsibility
January	Appoint permanent trade waste staff	WSD/PMU reforms
	Commence existing commercial customer program – start with customers causing network blockages	WSD
July	Commence working with remainder of existing commercial customers	WSD
	Monitor and invoice existing dischargers	WSD

### **Activity statements**

*Appoint permanent trade waste staff* – The reform process should be finalised to the point where the permanent staff recommended under TA 4270 can be deployed. The trade waste unit is comprised of a Manager and two trade waste inspectors. The interim report provided position descriptions and a resourcing plan based on work loads determined by the size of the customer base.

*Commence existing commercial customer program – start with customers causing network blockages* – There are approximately 814 commercial properties discharging to sewer. As the majority of these customers do not currently have pre-treatment installed, the contact with this segment should be prioritised based on current localised operational problems. The data for this priority plan will be sourced from the sewerage network managers based on history of chokes and blockages. This program should commence when the full complement of staff for the unit commence employment.

*Commence working with remainder of existing commercial customers* – Once the priority customers have been contacted, the unit will then develop a timetable for finalising permits with the remainder of existing connected customers. This work, based on the assumptions in the inception report, will take the remainder of 2007 and 2008 to complete.

*Monitor and invoice existing dischargers* – As each customer is contacted and commences the permit process, these customers will need to be monitored to ensure they are complying with their permit conditions and any special conditions that have been negotiated. By this stage the majority of customers have been contacted, therefore any paper based information systems will be stretched, therefore the IT solution should be in place and interfacing with the existing customer relations database to ensure accounts can be issued automatically.

**Table 2.7      2008**

Date	Activity	Responsibility
January	Review Trade Waste Policy	WSD
	Introduce quality charges for significant discharges	WSD
	Monitor and invoice existing dischargers	WSD

### Activity statements

*Review Trade Waste Policy* – The policy, as endorsed by WSD, is current for two years. By 2008, the policy will require a comprehensive review. This review should be based on the following parameters:

- feedback received from the Trade Waste Reference Group based on industry experience
- progress towards meeting the objectives of the policy
- review of the applicability of the acceptance standards in light of technological change and sewage treatment plant capabilities
- progress of implementation
- changes to legislation governing water and sewerage operations
- need to charge for a greater number of pollutants.

*Introduce quality charges for significant discharges* – The review of the policy will also be the mechanism to introduce quality charges for BOD<sub>5</sub>, Suspended Solids, Grease and Sulphate. The review should also revisit the assumptions made on the charging curves for BOD<sub>5</sub> and Sulphate based on levels of corrosion as monitored in sewage pumping stations and concrete structures.

*Monitor and invoice existing dischargers* – By this stage it is anticipated that the IT solution will be implemented, and the majority of Unit time is spent on monitoring existing customers.

## 2.5      PRINTED MATERIAL

Table 2.8 represents the documentation requirements for the commencement of the program.

This information has been included in the CEAP as part of the education material required for the 2006 financial year.

## 2.6      ADDITIONAL TECHNICAL RESOURCE REQUIREMENTS

There is a need to qualify the additional requirements to ensure the thorough implementation of the program. The major failing of the timing of the TA was the inability of WSD to provide either a counterpart or a dedicated resource who will assume responsibility for the ongoing management of the trade waste program. Therefore the timing of the TA has not allowed any opportunity for a review of any implementation or provided opportunities for a skills transfer to WSD staff.

**Table 2.8 Printed material**

Type of printed material	Title	Availability	Print run
Document (25 pages)	Trade waste policy and management plans	WSD staff, councils, Dept of Environment, consultants and industry groups	500
Form TW1 (three pages)	Application for permit (commercial customers)	WSD offices, councils	2500
Form TW2 (seven pages)	Application for permit (significant customers)	WSD offices, councils	500
Brochure/assistance booklet (to be developed – two pages)	Applying for a trade waste permit	To be available at WSD offices and councils Also to be sent out with application forms	3000
Brochure (to be developed – one page)	What is liquid trade waste?	WSD staff, councils, Department of Environment, training institutions	3000

In order for these two critical components of implementation to occur, there is a requirement for the following additional consultant inputs to occur:

*Local Consultant* – Currently resourced in a part time capacity until 30 November 2005. The role should be kept part time until the completion of the trial on 30 January 2006 (additional six weeks part time).

There is an additional need for the local counterpart to assist in further inputs in a part time capacity for six weeks during March/April 2006 to assist with the formal implementation.

*International Expert* – Currently resourced until 30 October 2005. There is an additional requirement of one week full time in February 2006 to review the trial results and assist with developing any workarounds. This time does not require the international expert to travel to Fiji as the local counterpart should be able to document the trial and submit it electronically for review.

There is also an additional requirement of four weeks in March/April 2006 to assist with the training and publicity activities in the proposed Implementation Plan.

The implementation plan also lists an additional input by a technical expert from a Kindred Water Authority to assist with skills transfer for four weeks in Fiji.

**Table 2.9 Summary of additional inputs**

Consultant	Timing in Implementation Plan	Duration
Local Consultant	December–January 2006	Six weeks part-time
	March-April 2006	Six weeks part-time
International Expert	February 2006	One week full-time
	March- April 2006	Four weeks full-time
Technical Expert from Kindred Water Authority	July 2006	Four weeks full-time

# 3 Community education awareness program (CEAP)

## 3.1 INTRODUCTION AND OVERVIEW OF PROGRESS OF CEAP ACTIVITIES

The WSD is committed through its corporate plan to have a customer focus which provides satisfaction and value to customers; and through professionalism and innovation to achieve service excellence.

The primary purpose of the CEAP is to assist WSD to prepare and implement a program that will raise public awareness of: water conservation; urban water systems; general water systems needs and costs; hygiene education, health and environmental effects of pollution; and consumer responsibilities in water and wastewater management.

Priority information materials have been produced, pretested, printed and distribution organised during this reporting period. Consultation and awareness activities with key stakeholders have been continued through CG meetings. Ongoing consultations with WSD management staff have been conducted and feedback on and approval of the priority materials achieved. Orientation of the WSD staff to the new information materials is also planned for November/December. Such a program has not existed in WSD so the concept has needed some promotion within the department.

This implementation period has also considered with the PMU reforms team how to institutionalise CEAP and PR into the reorganised WSD structure (as a communications unit) and a framework for a three year program of activities has been developed – the communication program.

CEAP and PR have been included as components of a broader communication strategy within the Customer Relations section of WSD which has an external focus (to customers and the public generally) as well as an internal component which allows CEAP and PR functions to serve the communications needs of WSD staff. This interaction will ensure that CEAP provides WSD information to customers as well as ensure that WSD operations and planning considers feedback from and consultations with customers.

Although no existing WSD staff yet have the capacity or capability to implement an ongoing CEAP, appointment of interim then permanent staff for the proposed Communication Unit within the Customer Relations section will augur well for the sustainability of the program. Some orientation and training may be required depending on the skills and experience of the recruited staff.

To ensure continuity, an ongoing program of activities and campaigns has been suggested. However, implementation will hinge on the development of an annual plan of activities once the WSD Communications Unit (CU) staff are in place.

## 3.2 IMPLEMENTATION DURING SEPTEMBER/OCTOBER 2005

Table 3.1 outlines the progress on tasks planned in the Interim Report.

**Table 3.1 The progress on tasks planned in the Interim Report**

Tasks from Interim Report accomplished in this reporting period	Implementation progress	Comments
Preparation and pre-testing of information resources	Twenty information materials (leaflets, posters and information sheets) drafted, pre-tested and printed.  Orientation of WSD staff and distributing agencies to the new materials; evaluation plan in place to assess the impact of use of the materials.	Additional time and resources requested for orientation activities and evaluation.  Examples of materials attached as Volume 3.  Distribution Plan forms Volume 3.
Consultative Group (CG) meetings	Two meetings held; information sharing by agencies; distribution networks of members used for WSD materials; new partnerships forged.	Members enthusiastic to have CG as an ongoing strategy of the WSD Communication Program.  More effort needed to convince WSD management of the benefits to WSD of CG meetings.  Minutes of CG 3 and CG4 (attached)
Ongoing PR activities	Activities to improve media interaction with WSD and improve public profile of WSD; journalist tours of WSD facilities; articles in Fiji Times on new materials.	Ministry of Information kept informed through attendance at CG meetings
Further development of the Public Information Program (now referred to as the Communication Program)	Structure, staffing and tasks of proposed new CU program negotiated with WSD and PMU reforms team; framework for ongoing CEAP and PR program finalised.	Proposed interim staff for CU submitted to WSD and PSC to ensure continuity of CEAP and PR activities.  Communication Program Framework attached as Volume 3.
Liaison with other Ministries and NGOs	Achieved through CG meetings and orientation to new information materials.  Two leaflets developed in collaboration with Fiji Red Cross and National Centre for Health Promotion (NCHP); NCHP also provided translation services for two posters.	
Liaison with other TA components	Information needs for WSD staff and customers in trade waste, environmental management and occupational health and safety documented in materials and activities plan.	Further information materials and communication activities documented in Volume 3.

Tasks from Interim Report accomplished in this reporting period	Implementation progress	Comments
Intersection with PMU reform team	<p>Discussion and feedback given to PMU reforms on description of services, KPIs and KRAs for proposed restructure.</p> <p>Training needs for CEAP/PR provided to training specialist.</p> <p>Discussions with Customer Relations specialist re institutionalisation of CEAP/PR in the reorganised WSD structure.</p> <p>Job descriptions and levels of service for CEAP/PR staff submitted.</p>	

### 3.2.1 Outcomes from implementation

**Table 3.2 'Best practice' development and distribution of 20 information materials to inform priority target groups**

Key theme	Title	Target group	Distribution	Type of media
General water system needs and costs	Your water meter	WRO customers, squatters, rural	WRO, MLGHSSE, MOH health inspectors	Information sheet
	High water bill? check for leakage	WRO customers, squatters	WRO, MLGHSSE, DoE, town/city councils	Information sheet
	Save water	WRO customers, squatters, rural, students	WRO, MLGHSSE, schools, Kinoya and Tamavua staff for tours, MOH public health teams/schools, NGOs	Leaflet
	Your water meter	WRO customers, squatters	WRO, MLGHSSE, town/city council	Poster
	Your water meter (Fijian)	WRO customers, squatters	WRO, MLGHSSE, town/city councils	Poster
	Your water meter (Hindi)	WRO customers, squatters	WRO, MLGHSSE, town/city councils	Poster
Urban water systems	How water is produced	Students, public	WRO, student tours, NGOs	Leaflet
	How water gets to your home	Students, public	WSD offices, WRO, treatment plants, MOH public health teams/schools, town/city councils	Poster
	Water treatment process	Students, WRO customers, public	Student tours, WRO customers, industry orgs, District Officers, town/city councils, WSD divisional staff	Information sheet

Key theme	Title	Target group	Distribution	Type of media
Hygiene education, health and environmental effects of pollution	Suva Nausori Water and Sewerage Project	Public, WSD staff	WRO, MLGHSSE, MOH Public health teams/schools, NGOs	Leaflet
	Safe collection and storage of water	Squatters, rural, residential areas where water cuts common	MLGHSSE, MOH public health teams, DoE, NGOs	Leaflet
	Your septic system	Squatters, residential, rural	MLGHSSE, WRO, NGOs, MOH public health teams/schools	Leaflet
	Water and sanitation after disasters	Rural, residential, students	Student tours, Red Cross, WSD divisional staff, health inspectors	Leaflet
	Toilets are for human waste -- --	Students, squatters	MOH public health teams/schools, MLGHSSE, town/city councils	Poster
	Toilets are for human waste – (Fijian)	Students, squatters	MOH public health teams/schools, MLGHSSE, town/city councils	Poster
Water Conservation	Toilets are for human waste – (Hindi)	Students, squatters	MOH public health teams/schools, MLGHSSE, town/city councils	Poster
	Don't waste water – turn off the tap	Students, public	Treatment plants, MOH public health teams/schools, WSD offices, district officers	Poster
	Don't waste water – fix that leak	Students, Public	Treatment plants, MOH public health teams/schools, WSD offices, district officers	Poster
	How to fix a leaking tap	Squatters, residential, rural	MLGHSSE, MOH public health teams, DoE, NGOs	Information sheet
WSD policies and procedures	Corporate plan summary	WSD staff	WSD	Information sheet

The listed materials can be viewed in Volume 3 – Appendix 1.

A list of further information materials, communication activities and campaigns will be addressed during the ongoing CEAP/PR activities (see Volume 3 – Appendix 2). This includes information materials and documents needed to support the OHS, environmental management and trade waste programs.

### Ongoing publicity

Key stakeholders (Government and NGO) are now better informed about WSD operations and water and sanitation issues as a result of the consultative group meetings and publicity gained through informing the Ministry of Information about the CEAP.

Government agencies and NGOs have also been involved in the development of information materials e.g. Safe Collection and Storage of Water with the National

Centre for Health Promotion (who have also assisted with translation services); and Water and Sanitation for Disasters with the Fiji Red Cross Society.

Media articles have been published in the Fiji Times and CG members publicised the new WSD CEAP through the fourth World Water Forum – Report on Pacific Progress on Water and Sanitation.

Staggered publicity campaigns are planned around the themes of the information materials in the new year as well as a launch of the materials in late November. Key journalists from the print and electronic media in Suva will receive a sample pack of the information materials and Media Liaison Officer will provide printed media with opportunistic stories to address issues as they arise in the media.

### **Increased understanding of WSD managers and staff of benefits of CEAP**

Workshops have been held with WSD managers from all divisions to promote the benefits to their role of two-way communication with customers. It has been emphasised that by addressing the adverse behaviours of some customers, the water and sewerage service delivery can be improved and customers will be ‘happier’.

There is now much enthusiasm within all WSD divisions at having information resources to enhance their service delivery to customers particularly for customer service staff.

During the distribution process, visits should be made to Northern and Western Divisions to promote the CEAP and the information materials to those staff and to give them an opportunity to express their information needs for the next phase of CEAP.

### **Community awareness of WSD and issues increased**

The CG strategy has been a major vehicle for increasing community awareness of WSD reforms and the Suva Nausori Project as well as to inform the development of information materials.

The two-way communication between members has meant that all stakeholders are aware of the activities in the water and sanitation sector; the potential for duplication of effort in water and sanitation resource development has been reduced; and the networks and clients of CG members have been used for distribution of WSD materials.

The CG meetings have been instrumental in sharing information across agencies on:

- progress of CEAP within WSD
- roles of government departments and NGOs in water and sanitation
- impact of the Environmental Management Act
- role of the Central Health Board (MOH)
- role of Suva City Council in administration of Acts regarding water and sanitation
- current activities of the PMU – reforms within WSD
- current issues from the Squatter Settlement Unit



- community based water testing using the H2S testing kit
- occupational health and safety requirements for WSD/water and sewerage workers.

### **Documentation of CEAP processes and ongoing program**

The CEAP comprises the following components:

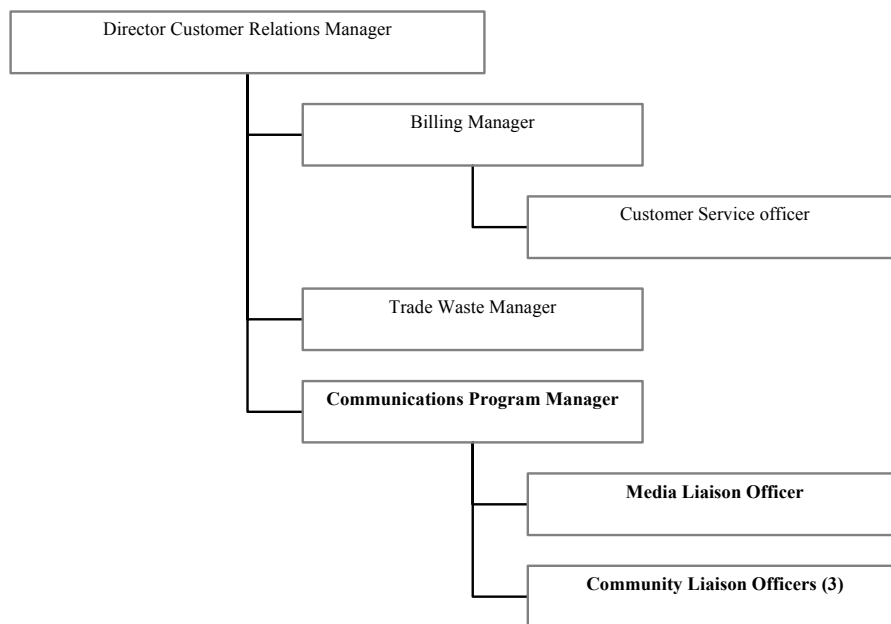
- community consultations
- social research
- development of information materials
- partnerships.

Volume 3 – Appendix 3 documents these CEAP processes. Volume 3 – Section 2.2 of this report documents the framework for an ongoing communication program.

These guidelines will be useful as orientation for new staff appointed to the CU.

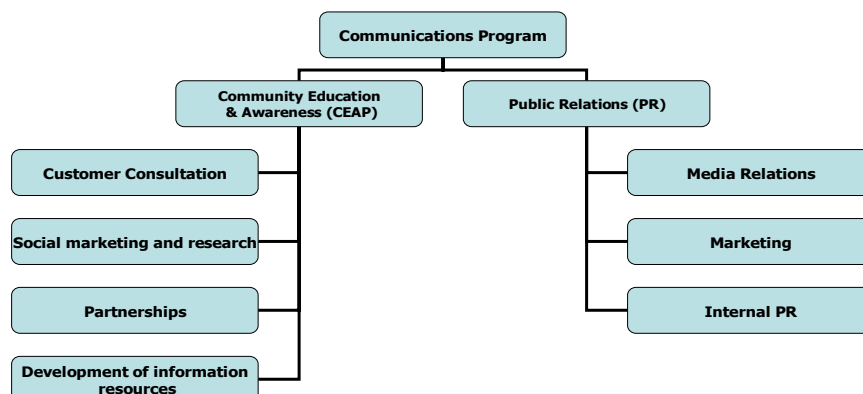
### **Proposed management of communication program**

Figure 3.2 describes staffing arrangements for the communication program within the customer relations.



**Figure 3.1**  
**Flowchart of staffing arrangements for the communication program within the customer relations**

## TASKS OF COMMUNICATIONS UNIT



**Figure 3.2**  
**Tasks of Communications Unit**

### Training needs for CEAP

The following training and support needs for WSD staff have been identified:

- WSD management and customer relations staff oriented to new CEAP materials
- orientation of interim staff to WSD Communications Program including CEAP processes
- communication skills for customer relations and communications program staff (combined training)
- social research skills for communications program staff and selected customer relations staff e.g. focus groups, survey skills
- development of IEC materials – for Communication Program staff (PIM, MLO, CLOs)
- orientation for WSD CEAP staff and senior management by Fiji Electricity Authority.

### Distribution plan

A comprehensive distribution plan and schedule for the dissemination of information materials has been developed and forms Volume 3 – Appendix 4.

A launch of the materials by the Minister of Works and Energy and/or the Chief Executive Officer is place by late November 2005 followed by an intensive distribution phase with orientation sessions with all recipients of the materials. This will include visits to the Northern and Western Divisions to orientate WSD staff to the materials and the ongoing CEAP.

Distributors would be informed of their responsibilities regarding tracking use of the materials and assistance with evaluation of the impact of the materials at the end of 2006.

### **Evaluation of community awareness and education activities**

Evaluation was planned for the end of 2006. An evaluation plan will be developed in conjunction with the Annual Plan scheduled for March/April 2006.

#### *Evaluation of information materials*

The objective of the evaluation exercise will be to assess the impact of the use of the materials and provide feedback on further information needs. The evaluation process will answer such questions as:

- Has information had any impact?
- Have materials reached target groups as planned?
- Has there been any behaviour change in customers?
- What has WSD staff learnt from this?
- What effect has a better informed public had on water and sewerage operations?
- What follow-on information is needed?

The process will involve collection of both quantitative and qualitative information on reach of the materials as well as impact on the respective target groups. All distributors will be interviewed and/or surveyed. A survey tool is attached to the description of the CEAP process (Volume 3 – Appendix 3).

### **3.2.2 Communication program framework**

This framework has been developed to describe the ongoing strategies and outputs for a Communication Program – CEAP and PR activities.

Purpose of a CEAP in WSD:

- WSD is committed through its Corporate Plan to have a customer focus which provides satisfaction and value to customers
- CEAP can strengthen the efficient operation and management of water and sewerage services through understanding customer behaviours
- CEAP can address the barriers to customer's using water and sewerage services properly
- CEAP can promote the benefits to customers of valuing and sustainable use of water and sewerage services.

#### **Purpose of a public relations program in WSD**

- to create and maintain a productive relationship with the media
- to promote the improved efficiency of WSD to provide water and sewerage services to its customers
- to provide the public (and WSD staff) with up-to-date information on WSD activities and projects
- to provide support to communication of messages developed under the CEAP.

## **In order to achieve the corporate mission**

*'To provide wide access to sustainable water supply and sewerage services of an appropriate quality and reliability, and at lowest possible cost'* – it is now recognised that the WSD can strengthen the efficient operation and management of water and sewerage services through customer consultations and customer education and awareness initiatives. The WSD also has an obligation to ensure that services are provided to customer expectation, and that they meet regulatory health requirements. This Communications Program strategy describes this important two-way communication.

In the past, WSD has had limited resources to implement a communication program. With its recent restructuring into a separate department with autonomous budgeting and with assistance from ADB, the CP can now be developed as a vital unit within the customer relations section of the department.

Note: In the Interim Report, this function was referred to as the Public Information Program. After further consideration by Community Awareness Specialist, Public Relations Specialists and PMU reforms Customer Relations Specialist, it was decided that the term Communication Program best described the need for two-way communication between customer and WSD staff; and the need to also serve the information needs of WSD staff (as well as the public).

## **Purpose of the communication program**

- to raise public awareness of issues which affect the efficient and effective delivery of water and sewerage services (through CEAP)
- to ensure future water and sewerage service delivery planning and operations are informed by consultation with customers
- to support information and awareness needs of WSD staff.
- to build public confidence in the ability of WSD to deliver safe and reliable water and sewerage.

## **Objectives of the communication program**

- *informed customers* – raise public awareness of significant water and sewerage issues to enhance effective delivery of water and sewerage services; feedback to WSD on customer concerns (through CEAP)
- *customer-focused WSD* – information and training to instill in WSD staff the rights of customers to value for money from WSD in the provision of water and sewerage services
- *information development and dissemination* – development of appropriate information for WSD customer groups and WSD staff – widely disseminated and evaluated for impact
- *partnerships with external stakeholders* – utilisation of existing resources to maximise impact of the Communication Program and encourage private sector participation

- *public relations* – improving the public confidence in the ability of WSD to deliver safe and reliable water and sewerage profile of WSD.

### 3.3 OVERALL STRATEGY FOR AN ONGOING ACTIVITIES

The implementation of ongoing CEAP and PR activities depends on the timely recruitment of proposed staff for the Communication Unit – Public Information Manager, MLO and Community Liaison Officers (3). Arrangements have been made for contracting of interim staff to these positions.

Priority activities for immediate implementation to ensure continuity and momentum are:

- Monitoring of the distribution process (December 2006):
  - compile materials into lots as per distribution plan
  - prepare sample packs (20) – with cover sheet and explanation
  - delivery of materials to CG members/distributors and WSD offices
  - this includes orientation to materials.
- distribution of assigned materials to councils, health centres, environmental health officers. This is to include orientation to the materials (December 2006)
- orientation of WSD staff to use of materials and evaluation plan (three WSD divisions, Suva Water Supply, Water Rates Office, Tamavua Treatment Plant, Kinoya Treatment Plant) (December 2006)
- launch of information materials by Minister for Works and Energy with CEO and Director, WSD (late November 2006). The Ministry of Information will assist
- monitoring of receipt and use of materials – displays in Councils, WSD offices etc (March 2006)
- recruitment and appointment of Communication Unit (CU) staff (Manager, MLO, CLO) (by March 2006)
- planning for World Water Day activities – print run of selected existing information materials and display (22 March 2006)
- planning for first billing quarter (March 2006) – insert Your Water Meter (leaflet) – special print run (20,000). This information sheet will need to be printed in February 2006.
- orientation of new CU staff (March 2006)
- planning for first CG meeting (March/April 2006)
- planning for campaigns and community consultations
- consider reprints of Batch 1 materials.

Following the appointment of the CU staff, an annual planning process can begin. Planning will include consideration of the further list of materials, activities and equipment for an ongoing program.

A schedule for evaluating the CEAP activities will also be planned at this time.

## Communication program framework

**Table 3.3 Informed customers**

Objectives	Strategies	Outputs	Key performance indicators	Related Key Results Area
Raise public awareness of significant water and sewerage issues through CEAP process	Identify the barriers and benefits to customers' sustainable use of WSD water and sewerage services	Consultations/focus groups and surveys conducted with selected customer groups	Customer satisfaction: water supply and sewerage	KRA 3 – Efficiency: -level of UFW
	Develop a plan using activities shown to be effective in raising awareness and changing behaviour e.g. information, seeking commitment, incentives etc.	Reports on and needs assessments of consultations with key customer groups	Recovery of operational and maintenance costs of treated water and sewerage	KRA 4 – Effectiveness: -incidence water-related disease -level of customer satisfaction
	Regular consultation with key customer target groups by Community Liaison Officers (CLO)	Reports on customer satisfaction surveys and focus groups	Decreased unaccounted-for-water (UFW)	-implementation of public awareness raising programs
	Annual customer satisfaction surveys	Annual plan of activities	Access to piped sewage collection system	KRA 5 – Sustainability: -extent of service provision cost recovery
	Regular consultation with all WSD sections by PIU staff	Increased revenue from improved timely payment of bills	Decrease in water-related diseases	-management of service demand
	Development and pre-testing of planned information materials and communication activities	Sewer blockages from improper use of toilets decreased		
	Feedback to WSD on customer concerns	Willingness to connect to sewer increased		
		CLOs report on all customer consultations		
		Monthly CLO reports		

**Table 3.4 Customer focused WSD**

Objectives	Strategies	Outputs	Key performance indicators	Related key results area
Quality controlled development of appropriate information for WSD customers – produced, disseminated and evaluated	<ul style="list-style-type: none"> <li>-Regular information needs assessments by PIM through customer liaison process and communication with staff</li> <li>-Development of main messages and content with appropriate technical experts</li> <li>-Outsourcing of production of information materials and communication activities</li> <li>-Scripting of communications activities with contractor</li> <li>-Follow IEC guidelines for development of information materials</li> </ul>	-Annual selection of key customer groups and issues to be addressed	Customer satisfaction: water supply and sewerage	KRA 3 – Efficiency: -level of UFW
		-Annual plans from divisions and sections re information resource needs		
		-IEC guidelines followed	Recovery of operational & maintenance costs of treated water and sewerage	KRA 4 – Effectiveness: -incidence water-related disease
		-Technical experts input acknowledged in reports and materials produced		
		-Three quotes on contracted design work and printing submitted and approved by WSD management	Decreased unaccounted-for-water (UFW)	-level of customer satisfaction -implementation of public awareness raising programs
		-Service agreements with contractors drawn up	Access to piped sewage collection system	
		-Materials produced and communication activities implemented		
		-Scripts for communication activities approved by WSD management	Water consumption – total (litres/person/day) and domestic (litres/household/day)	KRA 5 – Sustainability: -extent of service provision cost recovery -management of service demand
			Prevalence of water-related diseases	
			Contribute to 100% compliance with water supply metering system	
			Reports from public on leakage, burst pipes etc	

Objectives	Strategies	Outputs	Key performance indicators	Related key results area
Quality controlled development of appropriate information for WSD divisional staff e.g. OHS, trade waste, tariffs, environmental management, Suva Nausori Water and Sewerage Project – produced, disseminated and evaluated	<ul style="list-style-type: none"> <li>-Annual workshops with WSD managers to determine information resources needed</li> <li>-Development of main messages and content with appropriate technical experts</li> <li>-Outsourcing of production of information materials and communication activities</li> <li>-Scripting of communications activities with contractor</li> <li>-Follow IEC guidelines for development of information materials</li> <li>-Use distribution networks established through CG</li> <li>-Monitor distribution of materials</li> <li>-Program of inserting information in WRO residential bills</li> <li>-Program of inserting information in industrial/commercial customers' bills</li> <li>-Follow evaluation process for assessing impact of information materials and activities</li> </ul>	<ul style="list-style-type: none"> <li>-Annual plans from divisions and sections re information resource needs</li> <li>-Technical experts input acknowledged in reports and materials produced</li> <li>-Three quotes on contracted design work and printing submitted and approved by WSD management</li> <li>-Service agreements with contractors drawn up</li> <li>-Materials produced</li> <li>-Communication activities with WSD staff implemented</li> <li>-Distribution plan for dissemination of all information materials</li> <li>-Random checks of material distribution and reach</li> <li>-20,000 print run x four times/year</li> <li>-1,000 print run x four times/year</li> <li>-Evaluation process established and followed</li> <li>-Evaluation report on outcomes and impact of information materials</li> </ul>	<ul style="list-style-type: none"> <li>Customer satisfaction: water supply and sewerage</li> <li>Recovery of operational and maintenance costs of treated water and sewerage</li> <li>Decreased UFW</li> <li>Access to piped sewage collection system</li> <li>Water consumption – total (litres/person/day) and domestic (litres/household/day)</li> <li>Decrease in water-related diseases</li> <li>Contribute to 100% compliance with water supply metering system</li> </ul>	<ul style="list-style-type: none"> <li>KRA 3 – Efficiency: <ul style="list-style-type: none"> <li>-level of UFW</li> </ul> </li> <li>KRA 4 – Effectiveness: <ul style="list-style-type: none"> <li>-incidence water-related disease</li> <li>-level of customer satisfaction</li> <li>-implementation of public awareness raising programs</li> </ul> </li> <li>KRA 5 – Sustainability: <ul style="list-style-type: none"> <li>-extent of service provision cost recovery</li> <li>-management of service demand</li> </ul> </li> </ul>



**Table 3.5 Information development and dissemination**

Objectives	Strategies	Outputs	Key performance indicators	Related key results area
Work with stakeholders to use expertise and existing resources of other agencies to maximize impact of WSD communication program.	- CG (Water and Sanitation Interest Group) sustained by WSD/PIM	-Four CG meetings per year – speakers and exchange of information	Private sector participation	KRA 3 – Efficiency: -extent of private sector participation in service provision
	-Use of puppets to communicate water and sewerage messages and information to primary school students	-Minutes of CG meetings	Evaluation of CG collaboration	
	-Use of drama as needed to communicate specific water and sewerage messages and information to selected target groups	-Training and scripting sessions with Fiji Red Cross puppeteers on selected water and sewerage issues	Outreach to primary school students	KRA 4 – Effectiveness: -implementation of public awareness raising programs
		-Contracting of puppeteers to communicate messages with selected schools		
		-Training and scripting sessions with drama NGOs on selected water and sewerage issues		KRA 5 – Sustainability: -extent of service provision cost recovery
		-Contracting of drama NGOs to communicate selected messages with selected target groups		-management of service demand
		-Evaluation report on impact and outcomes of collaboration with external stakeholders and contractors		KRA6 – Rural and Periurban water supply services: -planning with other GOF agencies

Objectives	Strategies	Outputs	Key performance indicators	Related key results area
Encourage private sector participation	<ul style="list-style-type: none"> <li>-Liaise with Consumer Council of Fiji to encourage promotion of water-wise products</li> <li>-Include selected water and sanitation related private businesses to contribute and be involved in CG (Water and Sanitation Interest Group)</li> <li>-Include selected product recommendations in information materials</li> <li>-Plan for joint campaigns with selected private sector companies</li> </ul>	<ul style="list-style-type: none"> <li>-Collaboration with Consumer Council of Fiji</li> <li>-Orientation and workshops with selected WS-related businesses</li> <li>-Joint campaigns implemented with private businesses</li> <li>-Information materials promote water-wise products</li> </ul>	<ul style="list-style-type: none"> <li>Private sector participation</li> <li>Evaluation of joint campaigns</li> </ul>	KRA 3 – Efficiency: -extent of private sector participation in service provision

**Table 3.6 Partnerships with external stakeholders**

Objectives	Strategies	Outputs	Key performance indicators	Key results area
Improve public trust in WSD	<ul style="list-style-type: none"> <li>-Regular consultation by MLO with all sections of WSD</li> <li>-Regular interaction between WSD and journalists</li> <li>-Active monitoring of and reaction to news stories by MLO</li> <li>-Use of electronic media for promotion of WSD operations</li> <li>-WSD/CU staff visiting communities/customers to share information</li> </ul>	<ul style="list-style-type: none"> <li>-Media contact list maintained</li> <li>-Media relations improved</li> <li>-Media kits for journalists</li> <li>-Proactive promotion of WSD ‘news’</li> <li>-Plant tours for journalists</li> <li>-Regular press releases and -FAQ sheets</li> <li>-MoI Tags on Fiji One</li> <li>-Press releases and letters to the editor reacting to news stories</li> <li>-WSD public displays</li> <li>-WSD website maintained</li> <li>-Monthly analysis of media treatment of WSD</li> <li>-Public speaking program implemented</li> </ul>	<ul style="list-style-type: none"> <li>Customer satisfaction levels</li> <li>Proportion of positive press for WSD</li> <li>Level of complaints</li> <li>Requests for information processed</li> </ul>	KRA 4 – Effectiveness: -implementation of public awareness raising programs  KRA5 – Sustainability: -management of service demand

Objectives	Strategies	Outputs	Key performance indicators	Key results area
Promote the improved efficiency of WSD to enhance effective delivery of water and sewerage services	<ul style="list-style-type: none"> <li>-Regular stories on progress of Suva-Nausori Water and sewerage Project</li> <li>-Issues and concerns of customers known and addressed openly in media</li> </ul>	<ul style="list-style-type: none"> <li>-Photo opportunities and progress reports to media</li> <li>-‘Ask Mr Paaniwallah’ column in newspaper</li> <li>-Opportunities for media coverage with release of new information materials</li> <li>-Promote CEAP activities</li> </ul>	<ul style="list-style-type: none"> <li>Customer satisfaction levels</li> <li>Level of complaints</li> <li>WSD staff performance reviews re customer service</li> </ul>	<ul style="list-style-type: none"> <li>KRA 4 – Effectiveness: <ul style="list-style-type: none"> <li>-implementation of public awareness raising programs</li> </ul> </li> <li>KRA5 – Sustainability: <ul style="list-style-type: none"> <li>-management of service demand</li> </ul> </li> </ul>
Assist with communication between WSD sections	<ul style="list-style-type: none"> <li>-Inform WSD staff of news and views</li> <li>-Develop policies and procedures for dealing with media</li> <li>-Inform WSD staff of all policies and procedures</li> <li>-Integration of information about critical functions across SWS and WRO</li> </ul>	<ul style="list-style-type: none"> <li>-Assist with PMU reform newsletter</li> <li>-WSD staff undergo training and orientation to new policies, practices and new information materials</li> </ul>	<ul style="list-style-type: none"> <li>Customer satisfaction levels</li> <li>WSD staff performance reviews re customer service</li> <li>Evaluation of staff training</li> </ul>	<ul style="list-style-type: none"> <li>KRA 4 – Effectiveness: <ul style="list-style-type: none"> <li>-implementation of public awareness raising programs</li> </ul> </li> <li>KRA5 – Sustainability: <ul style="list-style-type: none"> <li>-management of service demand</li> </ul> </li> </ul>
Develop a corporate image and branding for WSD	Develop organisation brand and design appropriate material	<ul style="list-style-type: none"> <li>-WSD logo developed</li> <li>-Style Guide on use of logos and other branding developed</li> <li>-Design and development of WSD website</li> </ul>	Public recognition of WSD	<ul style="list-style-type: none"> <li>KRA 4 – Effectiveness: <ul style="list-style-type: none"> <li>-implementation of public awareness raising programs</li> </ul> </li> </ul>

**Table 3.7 Public relations**

Objectives	Strategies	Outputs	Key performance indicators	Key results area
Improve public trust in WSD	<ul style="list-style-type: none"> <li>-Regular consultation by MLO with all sections of WSD</li> <li>-Regular interaction between WSD and journalists</li> <li>-Active monitoring of and reaction to news stories by MLO</li> <li>-Use of electronic media for promotion of WSD operations</li> <li>-WSD/CU staff visiting communities/customers to share information</li> </ul>	<ul style="list-style-type: none"> <li>-Media contact list maintained</li> <li>-Media relations improved</li> <li>-Media kits for journalists</li> <li>-Proactive promotion of WSD ‘news’</li> <li>-Plant tours for journalists</li> <li>-Regular press releases and FAQ sheets</li> <li>-MoI Tags on Fiji One</li> <li>-Press releases and letters to the editor reacting to news stories</li> <li>-WSD public displays</li> <li>-WSD website maintained</li> <li>-Monthly analysis of media treatment of WSD</li> <li>-Public speaking program implemented</li> </ul>	<ul style="list-style-type: none"> <li>Customer satisfaction levels</li> <li>Proportion of positive press for WSD</li> <li>Level of complaints</li> <li>Requests for information processed</li> </ul>	<ul style="list-style-type: none"> <li>KRA 4 – Effectiveness: <ul style="list-style-type: none"> <li>-implementation of public awareness raising programs</li> </ul> </li> <li>KRA5 – Sustainability: <ul style="list-style-type: none"> <li>-management of service demand</li> </ul> </li> </ul>
Promote the improved efficiency of WSD to enhance effective delivery of water and sewerage services	<ul style="list-style-type: none"> <li>-Regular stories on progress of Suva-Nausori Water and sewerage Project</li> <li>-Issues and concerns of customers known and addressed openly in media</li> </ul>	<ul style="list-style-type: none"> <li>-Photo opportunities and progress reports to media</li> <li>-‘Ask Mr Paaniwallah’ column in newspaper</li> <li>-Opportunities for media coverage with release of new information materials</li> <li>-Promote CEAP activities</li> </ul>	<ul style="list-style-type: none"> <li>Customer satisfaction levels</li> <li>Level of complaints</li> <li>WSD staff performance reviews re customer service</li> </ul>	<ul style="list-style-type: none"> <li>KRA 4 – Effectiveness: <ul style="list-style-type: none"> <li>-implementation of public awareness raising programs</li> </ul> </li> <li>KRA5 – Sustainability: <ul style="list-style-type: none"> <li>-management of service demand</li> </ul> </li> </ul>

Objectives	Strategies	Outputs	Key performance indicators	Key results area
Assist with communication between WSD sections	<ul style="list-style-type: none"> <li>-Inform WSD staff of news and views</li> <li>-Develop policies and procedures for dealing with media</li> <li>-Inform WSD staff of all policies and procedures</li> <li>-Integration of information about critical functions across SWS and WRO</li> </ul>	<ul style="list-style-type: none"> <li>-Assist with PMU reform newsletter</li> <li>-WSD staff undergo training and orientation to new policies, practices and new information materials</li> </ul>	<ul style="list-style-type: none"> <li>Customer satisfaction levels</li> <li>WSD staff performance reviews re-customer service</li> <li>Evaluation of staff training</li> </ul>	<ul style="list-style-type: none"> <li>KRA 4 – Effectiveness: <ul style="list-style-type: none"> <li>-Implementation of public awareness raising programs</li> </ul> </li> <li>KRA5 – Sustainability <ul style="list-style-type: none"> <li>-Management of service demand</li> </ul> </li> </ul>
Develop a corporate image and branding for WSD	Develop organisation brand and design appropriate material	<ul style="list-style-type: none"> <li>-WSD logo developed</li> <li>-Style Guide on use of logos and other branding developed</li> <li>-Design and development of WSD website</li> </ul>	Public recognition of WSD	<ul style="list-style-type: none"> <li>KRA 4 – Effectiveness: <ul style="list-style-type: none"> <li>-Implementation of public awareness raising programs</li> </ul> </li> </ul>

Proposed campaigns for the next three years could include the following:

#### **Campaigns 2006–08 – by target group**

- WRO customers – three monthly info in bills (general water system needs and costs) – reprints of existing materials
- WSD staff – Occupational health and safety leaflets, posters, information sheets (14 topics) and posters (purchased and developed locally)
  - connections, disconnections, illegal connections information sheets
  - billing procedures – information sheets
  - complaints procedures – information sheets.
- public – sewerage – information sheets, posters and leaflets
  - trade waste – customer application forms, leaflets and information for staff
  - rainwater collection as standby water supply
  - waterwise products.
- teachers/students
  - leaflet to promote tours of treatment plants.
- primary schools – puppets (water and toilet theme). This strategy will require orientation workshops where scripts can be developed.

### **3.4 CONCLUSION**

Despite the fact that CEAP has not existed in WSD before and that WSD staff to implement CEAP are not yet in place, significant achievements have been made in building the capability for WSD to implement such a program. These include:

- ‘best practice’ development of 20 information materials to inform priority target groups; ongoing media coverage on current themes
- better understanding by WSD managers and PMU Reform team of benefits of two-way communication with customers
- better understanding by WSD staff of how to address customer behaviours that can impede WSD operations
- enthusiasm re new information resources
- key stakeholders (Government and NGO) better informed about WSD operations and water and sanitation issues; involvement in development of materials
- potential for duplication of effort in resource development reduced
- utilisation of networks and clients of CG members for distribution
- processes documented – consultation with customers and development of information materials
- an ongoing CEAP has been negotiated and staff will be appointed.

Acquittal of the Scope of Services for the Community Awareness Specialist forms  
Volume 3 – Appendix 5.

# 4 Customer relations and public relations

## 4.1 REPORT OBJECTIVE

The purpose of this final report is to:

- discuss what has been delivered according to the TOR
- discuss the benefits that the deliverables will bring to the organisation
- conclude with an Implementation Plan for each the public relations and customer relations components of this TOR.

Several of the implementation activities that were scheduled under TA 4270 were dependent upon WSD staffing and decision endorsement. WSD counterpart staff were not in place, nor was endorsement of the Customer Service and Complaint Policy by WSD timely.

Accordingly, certain implementation activities are delayed and are now included within the proposed future activities timetable. Similarly, development of the long term Customer Relations Plan awaits the finalisation of the structure of the Customer Relations Unit, being assessed by the PMU reform team. Nonetheless, recommendations have been provided in Section 2 and have been discussed in detail with the PMU reform team. These items have also been included as future activities, part of the Implementation Plan for customer relations.

## 4.2 DELIVERY AGAINST THE TOR

The TOR consists of six main areas.

1. Review existing practices within WSD/WSC in customer service and its public relations and image across the broader community and stakeholder groups.
2. Promote a consistent message through both employees and the media that supports the objectives of the CEAP.
3. Improve the ability of the customer service and front-end staff to meet the needs of customers.
4. Develop and implement an issues management framework and supporting procedures for WSD/WSC to improve communications with the media.
5. Develop a customer relations/public relations framework and long-term strategic plan.
6. Implement improved internal communications that increases awareness and understanding of the aims of the current ADB supported technical assistance and institutional reform programs.

The initial aim of the public relations area was to support the aims of the CEAP. In the Inception Report it was identified that public confidence in the WSD was poor, and this



needed to be improved for the CEAP to be successful. As a result the objective of public relations was expanded to improve public confidence in WSD. The public relations function has been placed within the new CU, which also encompasses the community education and awareness function. The framework for the CU has been discussed in detail in the CEAP section of this report so will not be repeated in this section. The public relations program developed as part of this TOR has been included in Volume 4 – Appendix 4.

**Table 4.1**

TOR	Level of achievement	Outcomes	Challenges
Review existing practices within WSD in customer service and public relations and identify shortcomings	Complete	Gap analysis of customer service (Volume 4 – Appendix 1)	Customer services currently under different areas and minimal reporting and data on customer complaints and services
Promote a consistent message through both employees and the media that supports the objectives of the community education and awareness program	Complete	Assessment of customer relations in the West (Volume 4 – Appendix 2)	Currently no media officer to carry out implementation
	Complete	Media releases published	Public relations programme to coincide with distribution of materials which is only due after this portion of TA completed
	Development completed	Media and staff tours on WSD operations (Volume 4 – Appendix 3)	
	Development completed	Public relations framework (Volume 4 – Appendix 4)	
	In progress due for completion end of November	Team Update procedures (Volume 4 – Appendix 5)	
		External customer service training includes educating staff on using IEC material (Volume 4 – Appendix 6)	
Improve the ability of the customer service and front-end staff to meet the needs of customers	Complete	In house training carried out for staff on key customer service message (Volume 4 – Appendix 7)	No training officers in WSD to carry out training
	Complete	Training needs analysis and implementation plan (Volume 4 – Appendix 8)	Not enough time to carry out sufficient evaluation of training
	Complete	Training package developed with external provider for delivery (Volume 4 – Appendix 6)	Reforms not yet in place so difficult to make staff report against customer service targets
	Completed for Water Supply and Sewerage	Key Performance Indicators (Volume 4 – Appendix 9)	No KRA relating to customer service so no drive for improved performance from upper management
	Completed for three most common enquiries	Reporting systems developed and implemented (Appendix 10, 11, 12, 13 for Water Supply and Volume 4 – Appendix 14, 15, 16 for Sewerage)	
	Completed for some staff	Procedures reviewed and changes implemented (Volume 4 – Appendix 17, 18, 19, 20, 21)	
	Developed	Review of position descriptions for key staff (Volume 4 – Appendix 22)	
		Customer service assessment forms (Appendix 23)	

TOR	Level of achievement	Outcomes	Challenges
Develop and implement an issues management framework and supporting procedures for WSD/WSC to improve communications with the media	Complete (development only and implementation plan)	Standard Incident Procedure (Volume 4 – Appendix 24) Templates produced for issues management (Volume 4 – Appendix 25, 26, 27, 28, 29) Procedure and workshop for issues management (Volume 4 – Appendix 30) Roles and Responsibilities for Incidents (Volume 4 – Appendix 31) Media Policy and Guidelines (Volume 4 – Appendix 32)	Media Officer and Customer Relations Advisor required for implementation Media Policy and Guidelines only endorsed in final placement making implementation impossible
Develop a customer relations/public relations framework and long-term strategic plan	Complete	Customer Service and Complaints Policy (Volume 4 – Appendix 33) Media Policy and Guidelines (Volume 4 – Appendix 32) Customer Service Implementation Plan (Volume 4 – Section 3.1) Public Relations Implementation Plan (Volume 4 – Section 3.2) Public Relations Framework (Volume 4 – Appendix 4)	No existing resources or division for customer relations or public relations
Implement improved internal communications that increases awareness and understanding of the aims of the current ADB supported technical assistance and institutional reform programs	Complete	Workshops incorporate TA to inform all staff Team Updates Procedures (Volume 4 – Appendix 5) Training Needs Analysis and implementation plan (Volume 4 – Appendix 8)	Currently no media officer to carry out team update procedures. To be carried out by Project Liaison Officer in the interim

### 4.3 DELIVERABLES SINCE INCEPTION

The TOR for customer relations and public relations was approved in May. The TOR was then divided into the following four main outcomes for practical delivery of the TOR:

1. Improved customer services within WSD
2. The development and implementation of a public relations program
3. The identification and implementation of training and communication needs within WSD
4. Development of an overall framework and strategy for customer relations and public relations.

A practical implementation timetable for the duration of the TOR was developed based upon the above four outcomes. Deliverables against this timetable have been provided in Volume 4 – Appendix 34.

#### **4.3.1 Customer relations**

Customer relations can be considered in one of the following three areas: customer needs, customer expectations or customer concerns. Each of these three areas is discussed below in the context of an overall strategy of how to improve customer relations in WSD. Some of these recommendations were tackled as part of this TOR. The remaining recommendations required higher-level reforms so have been discussed in depth with the consultants from the Institutional Reform Team and are incorporated into the Implementation Plan in Volume 4 – Section 3.1.

##### **Customer needs**

Customers have several needs from WSD. These can be broadly put into one of three categories:

- a safe, consistent and reliable water supply
- a sewerage system that effectively disposes of wastewater without leading to sanitation, environmental or aesthetic problems
- accurate and reliable billing for these services.

The first two needs, while important, are managed under the operational area of WSD. Day to day operations will not be considered in this report. However the need for accurate billing should be the domain of customer relations. Accurate billing revolves around water meters and any processes relating to their management. This includes that:

- meters are installed at all properties so customers can be billed for the amount of water that they consume
- meters are read correctly and regularly
- meters are accurate
- meters are replaced before their mechanical effectiveness ceases.

The current situation in WSD does not adequately meet these needs. The problems can be summarised as follows:

- The process of new meter connections is managed between two different groups. In the Central Division, customers apply for a new meter at the Water Rates Office (WRO), but new meters are issued by the Meter Shop and then installed by New Connections group at Water Supply. After the meters are installed, they must be entered into the billing system so that they can be read by the meter readers and billed by the WRO. This process suffers from communication problems between the two areas and the result is that it can take up to two years from when a meter is installed to when a customer is actually billed for the water they have been consuming.
- Meter reading suffers from poor efficiency due to meter labelling and installation. Meters are labelled with a silver tag that gives the meter identification number, and also have a serial number engraved onto the body. In a large number of cases, the meter identification number is missing so the body number must be checked to ensure that the

correct meter is read. In addition to this, meters are installed below ground level, which makes meters extremely difficult to read and to find. These two factors contribute to inefficiencies and errors in meter reading. Currently no data is kept on how many incorrect meter reads occur.

- There is no set program to check the accuracy of the meters. Meters are tested at the customer's request and expense if the customer believes that the meters are inaccurate. There are no consistent records for the number of meters that have been tested, or the accuracy of meters tested.
- In the Suva area, there is currently a three to six month backlog of seized meters that need replacement. These customers are billed based upon an estimate of their consumption from the last three months. Lautoka Water Supply estimates that greater than 30% of their meters have seized and hence they are estimating these bills. There is no meter replacement program based upon age of the meters. Customers who complain about estimated readings or ask for replaced meters (about 4% of complaints currently received through the WRO) will have their meters replaced within about three to five working days.

A gap analysis carried out during the Interim Phase identified the above deficiencies. Recommendations to address these issues are as follows:

- All functions relating to meters should be under one group and should be located within the customer relations function of WSD. This will have the benefit of reducing the communication issue and double handling that currently exists between Water Supply (where the meter supply, repairs, replacement and new connections are located) and the WROs (where billing, reading and disconnection are located). Meters are a key component of assessing revenue and so all functions related to meters should be located within the area that is responsible for revenue collection.
- The method of installing and labelling meters should be revisited. New meters should be installed above ground to facilitate more efficient meter reading. A different method to attach meter numbers to the meter should be investigated. Meter identification numbers should be engraved clearly on the meter body or the labels securely attached to meter body. Improvements in installation and labelling would significantly improve the efficiency of meter readers, disconnections and meter. No data is collected on the actual number of complaints but anecdotal evidence from customer complaints staff indicates that incorrect meter replacement is a significant source of complaints, particularly in the case of incorrect bills.
- Include an audit regime to test a percentage of meters before installed (for example 1 in 1000), report against the number and results of meters tested as a result of customer requests and develop a revised audit programme based upon outcomes of the audit.
- Investment in human resources and materials to replace all identified faulty meters within five working days.
- Development and implementation of a meters replacement programme based upon average mechanical life of a meter.

### **Customers expectations**

Once the main customers need has been met of accurate billing, the customer has an expectation of being able to carry out any regular interaction with WSD in the most

convenient manner possible. For the majority of customers, the only regular interaction is the payment of their bill. WSD as a customer-focused organisation has a responsibility to provide a variety of payment methods that are convenient for their customers. As a commercial organisation, WSD should investigate and implement the most cost effective mechanism for bill payment. The current service channel for customer payment is through the various water rates offices and through the billing offices. The Suva-Nausori area has four locations where payment can be made in person by cash or cheque between the hours of 8am – 4:30pm on working days. There is no other method of payment. This method of payment is inconvenient for customers that cannot travel to one of the offices or due to work cannot come in person during the designated hours to pay their bill. Not only is this failing to meet the expectations of convenience in paying their bills, it may also contribute to low or late revenue collection. Over the counter payment methods may not be the most efficient method to collect revenue. Recommendations in this area include:

- conduct customer research into preferred payment methods (for example phone payments, Internet, through third party collection agency, extended office hours) for different customer segments
- conduct a cost-benefit analysis for each of methods
- develop and implement appropriate method(s) and follow up with evaluation.

Discussions have been carried out with the Fiji Electricity Authority (FEA). Their customer research in this area indicates that using MH Supermarkets as a third party provider was the most appropriate alternative payment method. This should be one of the first options explored.

### **Customer concerns**

WSD also has the responsibility to address the concerns or enquiries of their customers. If the customer's needs and expectations are met, other customer contact can be minimised. However, there must be a process for addressing customer concerns. This type of contact may be any enquiry relating to new connections, change of address or it could be a contact as a result of WSD failing to meet the basic customer needs of accurate billing, consistent and quality water supply and sewerage services. Customers want the following from any contact as a result of a concern:

- they want it resolved at the first point of contact
- where first point resolution is not possible, they want a satisfactory and truthful response about what will be done to address their concern or enquiry and when it will be done
- they want to be treated in a fair and respectful way that leaves them feeling better than before they made the contact
- in some cases they may require a follow up contact from WSD when their concern has been resolved.

WSD does not currently meet these needs. The Interim Report discussed the main customer concerns, particularly in this area.

## **Deliverables during TA**

This TOR primarily concerns itself with the area of meeting customer concerns. While the first two areas are equally important, they involve structural high level changes and significant expenditure, which is beyond the scope of this TA. As a result, a gap analysis was conducted in the Interim Phase of this TA and the recommendations discussed with the PMU reforms and incorporated into the three year Implementation Plan. The third area, Customer Concerns, also requires structural and process changes within WSD but this area presented opportunities for improvement that could be carried out or put in motion during this TA. Three areas of focus were chosen for this TA:

- Creating a culture of customer service within WSD. Cultural change, to the level required takes years and could not be achieved during the life of this TA. However, the aim was to begin the process by introducing the concept of a ‘customer’ as opposed to a ‘consumer’ and the role of each of the front level staff in customer service.
- Analysing the most common enquiries and concerns, particularly at the WRO and improving the process and procedures to move towards first point resolution and improve customer satisfaction.
- Emphasise the importance of data collection and reporting against customer service indicators. There are very few reports produced of this nature, as customer service is currently not a Key Results Area (KRA) for WSD. The focus of this was to put the process in motion by setting up data collection and reporting formats and systems and training staff, from the field, in the office and their supervisors on their roles and responsibilities and their part of the process.

For convenience, all deliverables as part of this TOR have been detailed in Volume 4 – Appendix 34. The Customer Service and Complaints Policy and Guidelines, developed during the Interim Phase were endorsed by WSD in September. One of the requirements of this Policy is a customer focus of the front-line staff and this is difficult to measure as the TA was not of sufficient duration to develop, carry out and then evaluate the training workshops. Positive feedback was received from participants and their Supervisors, particularly in participants eager for further workshops. Interest was evident as many participants approached me in the following days and weeks to discuss the workshops and ask additional questions. Some examples are provided below that demonstrate changes as a result of customer service workshops:

- Disconnection fitters regularly disconnect customers who have not paid their bills. However, even though they have been told to, they do not inform the customer when they disconnect the water. A workshop was held to examine why this is the case and how they could be more customer-focussed in their job. As a result they have appointed one of the clerks to work with the fitters in the field and speak to customers before they are disconnected. This has resulted in not only a positive response from customers but also an increase in payments as a result of disconnections. The Billing Manager estimates that this action has directly increased disconnection payments by 15–20%.
- Staff in the Customer Service Centre reported an improvement in the number of daily reports compiled and submitted by Leading Hands. This was a result of a customer service and communication workshop conducted during the Interim Phase. This was still continuing in the October period.

- The Billing Manager of the WRO in Suva and the Sewerage Engineer showed great interest and voluntarily contributed to workshops for their staff in customer service. They also organised additional training sessions for their staff to reinforce key messages.

The new Key Performance Indicators (KPIs) were also confirmed for Water Supply, Sewerage and the WRO. In addition the electronic complaint registers were developed and a reporting format and procedure was developed for Sewerage and Water Supply. All relevant staff have been trained and the reporting procedures have been implemented. Supervisors and managers were also trained and involved in the process of reviewing these new reports. The WRO have reinitiated reporting for customer complaints but there is still some work to be done to report against all KPIs.

It should be noted that implementation would not be sustainable unless they are supported by the necessary human resources and structural changes that make customer service a priority of WSD.

#### **4.3.2 Public relations**

WSD is responsible for improvements in the quality and supply of the water and sewerage services it provides to its customers. Ageing pumps and distribution systems have meant constant disruptions to water supply; lack of internal governance systems have led to problems in billing mechanisms and customer service follow up has been poor. Furthermore, while a number of programmes are in place to upgrade, refurbish and augment the water supply and sewerage systems, it is clear that information on these activities has not been making its way to the public.

There is currently no media or information officer within the department (or indeed, the Ministry) and media liaison has been ad hoc and dependent on the personalities of a few members of staff. Through the delivery of TA 4270, media awareness has been raised amongst WSD management and there is a general acknowledgement of the need for positive media relations. However, the lack of skilled and dedicated personnel in this area has meant that, despite best intentions, involvement of the media in WSD work is minimal.

In the absence of appropriate personnel, the TA focused on addressing the immediate media relations needs of the WSD by designing and implementing a short-term media plan during the period of the TA. The details and deliverables of this program have been provided in Volume 4 – Appendix 34. Specifically, the TA activities aimed to develop within the WSD motivation for and capacity to compile and disseminate relevant, accurate and timely information to the mass media to ensure accurate and broad coverage of the WSD and its activities.

The key objectives of this TA were:

- the development and implementation of the short-term media plan
- the evaluation of this media plan to provide lessons and identify priority needs of WSD for developing a long-term public relations programme.

The main deliverables and corresponding benefits have been summarised below:

- The development and endorsement of WSD of the Media Policy and Guidelines. This provides a clear objectives, tools and guidelines on how the organisation as whole will interact with the media.

- Training and awareness in the importance of media relations for senior management. This has resulted in Senior Managers, including the Director, utilising media tools and the WSD counterpart to ensure positive stories receive media attention.
- Education and awareness on water systems for media and internal staff. This was identified as one of the key CEAP messages. A successful media tour and conference as well as staff tours were conducted, resulting in some positive coverage as well as honest and accurate reporting by the media that highlighted the importance and need for expenditure on water infrastructure.
- An improvement in relevant skills of the WSD counterpart. This included the use of media monitoring, compiling media releases, organising news conferences and developing relationships with members of the media. The month of October showed some positive articles in the paper that were taken from media releases compiled by the WSD Counterpart;
- Developing a relationship with the Ministry of Information (MOI) to assist in writing media releases for WSD. This relationship also had the benefit in building capacity with the WSD Counterpart;
- Development of an internal public relations tool to educate staff in CEAP key messages as well as provide updates and awareness on messages that are given to the public through the media. This is essential in educating staff so they in turn can promote WSD to their family and friends;
- Development of the framework for the CU and the Public Relations function within this unit. This has been discussed in further detail in the CEAP section of this report;
- The three year implementation plan, including a 14 month detailed timetable.

#### **4.4 IMPLEMENTATION TIMETABLE**

The implementation timetable for both customer relations and public relations is dependent upon the following:

- the reforms within WSD will occur
- interim staffing arrangements will be approved by the Public Service Commission (PSC).

##### **4.4.1 Customer relations**

While many components of customer relations have been developed, full implementation is only appropriate when the necessary higher-level process and structural changes have been completed. These changes are essential, as they will provide the funding, personnel and motivation to drive the necessary changes in the organisation. A customer service component is required in a large proportion of the functions currently carried out by WSD. During this TA it has become apparent that individuals at the 'grass roots level' will need external assistance to make the practical change in their everyday operations to comply with the customer service requirements. I would recommend that further external support be considered once the institutional reforms are in place to conduct a review of all existing procedures and implement the customer service requirements for the frontline staff.

The tables below represent the three-year implementation timetable for the Customer Relations Program. The first 14 months are detailed while the activities in later years are



more general so as to allow for further input once the Reforms have been completed. Many of the activities stem from recommendations in Section 2.1 and will be carried out under the guidance of the PMU reform consultants. The activities are defined in greater detail at the end of each calendar year table.

**Table 4.2 2005 – Interim measures before new staff**

Date	Activity	Responsibility
November	Training carried out by external provider	WSD/Project Liaison Officer
November	Reporting against KPIs	WRO Manager/Water Supply Supervisor/KSTP Manager
November–March	Team updates	Project Liaison Officer
November	Leading Hand workshop on reporting	Project Liaison Officer

### **Activity statements – 2005**

*Carry out training by external provider* – A complete training package on customer service was developed under this TA with the PSC Training Centre for WSD from deficiencies identified in the Interim Phase. The content has been approved and dates for the first three sessions in the Suva-Nausori area have been set. It is anticipated that this will be extended to the north and west early next year.

*Reporting against KPIs* – Reporting and review KPIs have been developed with staff and training sessions have been conducted with all relevant staff members. It is now the responsibility of the relevant managers to ensure this continues.

*Team updates* – These have been identified as the most appropriate method of internal communication. A work instruction, agenda and guideline for carrying these out for all team updates in water supply, WRO and KSTP has been produced and the Project Liaison Officer will carry these out. The aim is to expand this to other areas and the other divisions once the Media Officer is in place.

*Leading Hand workshop on reporting* – To ensure the reporting and review process is accurately carried out a training session is to be carried out for the Leading Hands of Water Supply on filling in Daily Reports. This will be done for the Suva-Nausori Region.

### **2006 – Implementation timetable**

Much of the work for the Customer Officer (CO) will involve the monitoring of reporting against the KPIs. This will develop throughout the year as a result of work carried out by the PMU reform. As such a detailed timetable or description cannot be provided at this time. The other major responsibility of the CO will be to develop and carry out the required training. This has been detailed in Volume 4 – Appendix 8. It is anticipated that guidance will be provided by the PMU Reform Consultants in both of these areas.

*Appoint interim customer relations staff* – As permanent staff will not be in place until the reform is further progressed, WSD has proposed developing an interim position as a ‘Customer Relations Advisor’ and ‘Customer Service Officer’. This position would be

filled on a term basis. It is anticipated that the necessary approvals and appointment will occur by March 2006.

**Table 4.3 2006 implementation timetable**

Date	Activity	Responsibility
March	Appoint interim customer relations staff	WSD/PMU reforms
	Confirm reporting lines	WSD/PMU reforms
	Familiarisation of new staff	WSD/PMU reforms
	Review implementation timetable	WSD/PMU reforms
April	Monitoring and review of reporting	PMU reforms/Customer Relations Advisor (CRA)
June	Review of all standard forms and written procedures in WRO to bring into compliance with Customer Service Policy. Include in training schedule	CO
September	Review Customer Service Policy	WSD/CRA
April to November	Carry out training for WSD staff	PMU Reforms/CRA/CO
Throughout year	Reinforce training messages into team updates	Customer Service Officer (CSO)/Media Officer (MO)
April to November	Evaluation of field and customer service staff according to customer service requirements	WSD/CO
THE FOLLOWING ACTIVITIES WILL BE CARRIED OUT DURING 2006 BUT ARE DEPENDANT UPON THE TIMING OF THE PMU REFORM TEAM SO MONTHS HAVE NOT BEEN INCLUDED		
	Confirm the incorporation of existing functions into the new customer relations area	PMU reform/WSD
	Develop customer contract	PMU reforms/WSD
	Review KPIs for customer service reporting	PMU reforms/CRA
	Develop procedure for prioritising of customer service complaints	Supervisors Water Supply/PMU reforms
	Develop most appropriate option for management of complaints (software and database)	PMU reforms
	Implement procedure including new reporting requirements	PMU reform/CRA/CO
	Develop proposal for centralised call centre (include training, staffing, IT and structural needs)	PMU reform
	Management of meter process to be incorporated into Customer Relations Function	PMU reform
	Develop efficiency monitoring and reporting for meter reading function	PMU reform
	Cost benefit analysis for changing the labelling and installation of water meters	PMU reform/CRA
	Develop proposal and funding to facilitate complete replacement of all seized meters by end of financial year	CRA
	Development of a meter replacement program	WSD/Billing Manager
	Investigate options for alternative payment methods	PMU reform
	Implementation of selected alternative payment method(s)	PMU reform/WSD

Date	Activity	Responsibility
December	Development of business planning process	PMU reform
	Implementation of business planning process	PMU reform/WSD/CRA
	Introduction of Performance Assessment based upon KRA targets for customer relations	PMU reform/WSD
	Review training requirements and incorporate into training timetable	PMU reform/CRA/CO
	Evaluation of Implementation Plan and review of monitoring and performance. Implement changes and incorporate into Implementation Plan for 2007	CRA/CO
	Develop training timetable for 2007	WSD/CO

**Table 4.4 2007 – Implementation timetable**

Date	Activity	Responsibility
February	Identify all position descriptions within organisation with customer service requirement	CRA/WSD
	Identify all current procedures or actions within organisation with customer service requirement	CRA/WSD
March	Appoint permanent staff for customer relations	WSD
	Familiarisation and training of new staff members	WSD/CRA/CO
April	Develop annual customer satisfaction surveys	WSD/CO
	Implement changes for meter labelling and installation	WSD/CRA
May	Carry out annual customer satisfaction surveys	CO
June	Evaluation of selected payment methods	CRA/CO
July	Evaluation of customer satisfaction surveys	CO
March – December	Rewriting of all position descriptions to include customer service focus	WSD/CO
March – December	Development of written procedures for all operations (must be done with staff)	WSD/CO
March – December	Testing and training of new procedures	WSD/CO
December	Evaluation of Implementation Plan and review of monitoring and performance.	CRA/CO
	Conduct business planning and prepare budgets for next financial year. Review and compile detailed implementation plan for 2008	CRA/CO
	Performance assessments of staff	WSD Managers

Date	Activity	Responsibility
Throughout year	Evaluation of field and customer service staff according to customer service requirements	WSD/CO
	Training of staff according to training timetable	WSD/CO
	Reinforce training messages into team updates	Customer Service Officer (CSO)/Media Officer (MO)

**Table 4.5 2008 – Implementation timetable**

Date	Activity	Responsibility
February	Implementation business plan	CRA
March	Develop timetable and program of review for key procedures for customer relations	CRA/CO
June	Carry out review of Customer Service and Complaints Policy	CRA/CO
Throughout year	Carry out annual actions (for dates see 2007)	Various

*Confirm reporting lines* – A new customer relations division will be formed and all activities to be conducted under this area need to be confirmed. Initially, there will be strong links with the operational areas as the complaint centres are situated within this area so reporting lines need to be confirmed. Once these areas move into the customer relations division, reporting and communication lines will need to be confirmed with the operational areas for response to service requests.

*Familiarisation of new staff* – This will include review of the requirements of the customer service policy and guidelines and the documentation developed under TA 4270. The new staff will be expected to carry on with implementation of the policy according to the guidelines and this Implementation Plan.

*Review implementation timetable* – When the interim positions are appointed, more details will be known about the timing of deliverables under the PMU reforms and depending upon the time of appointment, the implementation timetable may need to be altered.

*Monitoring and review of reporting* – An evaluation of the reporting will have to be carried out to determine if the systems implemented during this TA are still in place. Software improvements for complaint reporting have been proposed and these changes will need to be incorporated into the review. Until performance management systems based upon customer service are introduced, it will be the responsibility of the CRA to ensure that the reporting and review is carried out. Activities will include developing work instructions for the process, training and monitoring.

*Review of all standard forms and written procedures in WRO* – Include in training schedule – All written procedures and work instructions that currently exist should be checked against what is actually occurring in practice and then reviewed to incorporate any requirements with the policy. The training is to be incorporated into the timetable.

*Review customer service and complaints policy* – Any relevant institutional reforms are to be incorporated as well as confirming guidelines. Also include new standards of service from customer contract, KPIs.

*Carry out training for WSD staff* – Priority training has been identified and carried as part of this TA and some training modules have been produced. The PMU team will put the complete program together. Individual training sessions have not been included as part of the Implementation Plan so the Training Needs Analysis in Volume 4 – Appendix 8 is to be referred to.

*Develop a customer contract* – This is a document that states the agreed levels of service WSD will provide to the customers as well as formalising the customer requirements of prompt payment. This will need to include a review date to be incorporated into the implementation plan.

*Review KPIs for customer service* – The current KPIs may not be sufficient to adequately measure the KRA of customer service. The KPIs will need to be reviewed and possibly extended to ensure all standards required can be measured.

*Develop guideline for prioritising of complaints* – A basic draft has been produced for service complaint handling (Volume 4 – Appendix 41). This is to be developed further as part of the task force for customer service. The efforts are to be coordinated by the Customer Service Officer. Training and review is to be included as part of this activity.

*Develop most appropriate option for management of complaints* – Decide upon the most appropriate software and database management for customer complaints and hardware requirements.

*Implement new reporting and complaints handling* – Review and rewrite current procedures concerning complaints reporting, training requirements and assessment.

*Develop proposal for centralised call centre* – Location, software and hardware requirements, staffing (skill and numbers), training requirements, communication link with database and operational response area.

*Management of meter process to be incorporated into customer relations function* – Structural reforms to ensure that all meters are under the one area.

*Develop efficiency monitoring and reporting for meter reading function* – Develop and implement reporting for meter readers for number of meters read.

*Cost benefit analysis for changing the labelling and installation of water meters* – A change in labelling of meters along with installing new meters above ground is to be investigated and costed against expected efficiencies in meter reading.

*Develop proposal and funding request to facilitate complete replacement of all seized meters by end of financial year* – Carry out the investigation for each division, cost and put up an implementation timetable including resources for replacement.

*Development of a meter replacement program* – Use average life of meter to set replacement dates. Include in budget requirement.

*Investigate options for alternative payment methods* – Discuss with FEA customer research carried out. Should examine cost of alternative method, whether it meets what the customer expects, how often data can be uploaded to the main database and security concerns.

*Implement option for alternative payment method(s)* – Prepare implementation timetable, staff training, include in public relations program.

*Develop business planning process* – Currently there is only the corporate planning. Successive lower level plans are not produced. This roll down in business plans for each area and to the individual performance agreement needs to be developed. This should also be the basis for forward planning for budget allocations to each area.

*Implement business planning process* – Includes task force on how this will be done and implementation using individuals within WSD. Training for all staff to be incorporated.

*Introduction of performance assessment based upon KRA targets for customer relations* – This requires KRA for customer service in the corporate plan, which is then included as actions in the relevant business plans and translated as targets (linked to KPIs) for individual managers.

*Review training requirements* – in light of the institutional reforms and other technological changes, extensive training and awareness of staff will be required. These need to be identified throughout the process.

*Identify all position descriptions within organisation with customer service requirement* – Each position within the organisation is to be evaluated to determine if there is any customer service focus that needs to be considered. Reference to the policy. A list by priority is to be compiled.

*Identify all current procedures or actions within the organisation with a customer service requirement* – For each of the positions identified above, identify the procedures or tasks carried out that have a customer aspect. A list by priority is to be compiled.

*Appoint permanent staff for customer relations* – Additional positions would have been identified and submitted for approval. These staff should be appointed at about this time.

*Familiarisation and training of new staff members* – This involves review of the plan and positions descriptions and training on the policy.

*Implement changes for meter labelling and installation* – The results of the investigation and proposal for changes in meter labelling is to be implemented.

*Evaluation of selected payment methods* – Use customer satisfaction survey, revenue collected, cost of collection.

*Rewriting position descriptions* – All position descriptions need to be written to incorporate requirements of customer service. Produce a list of all staff that need modifications to their position description and then put together some standard ‘Skills, Knowledge, Experience’. Use workshops to get staff or their managers to determine what this will specifically involve in their position.

*Develop written procedures for all operations* – All current operations carried out that are associated with customer service for any front-line staff should be documented and all customer forms reviewed. This has been completed for some of the common enquiries at the WRO (Volume 4 – Appendix 17, 18, 19, 20, 21).

*Testing and training of all procedures* – Test procedures with actual staff. Include in training needs assessments.

*Develop timetable and program for review of all key customer relations procedures* – These procedures should be reviewed at least every two years to ensure that they are current. Compile a timetable for these to be checked against what is occurring in practice and retrain procedures as necessary.

### **Annual activities**

These activities are carried out on an annual basis. For timing refer to the implementation timetable for 2007:

*Incorporating messages into team updates* – Team updates will be conducted by the Media Officer at all existing team talks. The Customer Service Officer will be responsible for incorporating key messages from relevant training into these updates. Frequency of these talks is included in Volume 4 – Appendix 5.

*Evaluation of field and customer service staff* – Carry out performance assessments of staff using the observations sheets provided in Volume 4 – Appendix 23. These are to be used to provide opportunities for development to individual staff. It is to be coordinated and monitored by Customer Service Officer but carried out by direct managers.

*Evaluation of the implementation plan* – Conduct an evaluation of all activities carried out throughout the year. Include any changes into implementation plan for following year. Review the performance of each section in regards to KPIs. Identify areas of improvement and the specific actions to address these. This is to be done with the individual managers. Where relevant add these actions into the implementation plan for the following year.

*Develop training timetable for following year* – Compile new training timetable based upon evaluation of past year's activities and the review of the training requirements. This is to be provided to relevant managers.

*Conduct business planning and prepare budgets for next financial year* – carry out the implemented business planning process based upon results from customer surveys, evaluation of training, review of performance etc. This is to be detailed in the implementation plan for the following year.

*Performance assessments of staff* – Assess performance of staff and include specific actions from the business planning into the following year individual performance agreements.

*Carry out review of the Customer Service Policy and Guidelines* – (every two years after 2008) this should be done to include anything new in terms of the customer contract, include standards of service and also any modifications to the complaints management procedure.

*Incorporate customer service targets into the performance assessments of staff* – Use the KRA and reporting KPIs for customer service to assess performance of individual staff. This is dependent upon the business planning process and service level agreements in place.

*Develop annual customer satisfaction surveys* – Compile a survey that directly addresses the requirements of KRA of customer service that cannot be measured by current reporting. Also include questions to assess the success of any changes made (for example the introduction of new payment methods).

*Carry out annual customer satisfaction surveys* – Consider target groups, numbers required from each area, method of carrying out surveys.

*Evaluation of annual customer satisfaction surveys* – Results to be used for business planning of the Customer Relations Unit.

#### **4.4.2 Public relations**

The public relations programme has been discussed in the CEAP section in the context of the CU. The following specific objectives will be met through the public relations programme:

- create and maintain a productive relationship with the media
- promote the improved efficiency of WSD to provide water and sewerage services to its customers
- provide the public (and WSD staff) with up-to-date information on WSD activities and projects
- provide support to communication of messages developed under the CEAP.

The public relations programme uses a variety of media tools to engage journalists in promoting WSD activities and utilises several strategies to develop and maintain public confidence and trust in the WSD. This programme has been translated into the following implementation plan. Most activities in the implementation plan are dependent upon the appointment of a Media Officer to coordinate and carry out the activities. Once again, the activities have been described in detail at the end of the table.

**Table 4.6 2006 (14-month Public Relations Activity Plan)**

Date	Activity	Responsibility
March	Appoint Media Liaison Advisor (MO)	WSD/PMU reforms
	Orientation of MO	WSD management
	Coordination meeting with other communication staff and management	MO
	Convene internal briefing meetings with key staff on media policy and the Communication Unit	MO and (Public Information Advisor) PIA
	World Water Day (23 March)	MO, WSD operations
	Trade waste publicity - launch of programme, signing on of first trade waste customer	Trade Waste Advisor (TWA), MO
April	Develop press kit and FAQ sheets on the WSD and current issues	MO
	Convene individual meetings with key journalists and media outlets and update media contact list	MO
	Identify available television, radio and newspaper opportunities for public announcements and delivery of key messages	MO
	Prepare draft press releases on water conservation in dry season	MO, water supply



Date	Activity	Responsibility
May	CEAP campaign publicity and related activities – (radio talkback, press releases, photo opportunity): Theme 1	MO, PIA
	Organise media conference around a completed Suva-Nausori works activity (eg. Lakena area)	MO,
	Management and staff training on media involvement and media policy	WSD, MO
	Develop and set in place a daily briefing system for WSD	MO/PIA
	Develop generic exhibit	MO, PIA
	Preparation for National Environment Week (June 5) – investigate guest speaker opportunity, exhibit stands, special plant tours	MO, PIA, WSD management
	Develop and distribute internal news-sheet based on daily briefs	MO
June	Ongoing CEAP Theme 1 activities	MO, PIA
	National Environment Week (June 5) – oversee exhibit and ensure overall WSD involvement	MO, PIA
	Develop ‘Mr Paniwallah’ concept and establish newspaper schedule	MO, PIA, WSD operations staff
	Conduct Incident Management Workshop	CRA, MO, WSD senior managers
July	Evaluate internal news-sheet	MO, PIA
	Ongoing CEAP Theme 1 activities	PIA, MO
	Write first feature article on a successful WSD community-related activity	MO
	Conduct Incident Management Workshop (continued)	CRA, MO, WSD senior managers
	Develop and publish first ‘Mr Paniwallah’ column	MO, PIA
	Monitor and evaluate public feedback on ‘Mr Paniwallah’	MO, PIA
	Publicity for Environmental Legislation related activities (timing to be confirmed)	MO, Environment Manger
August	Second monthly internal news-sheet (or other staff briefing mechanism)	MO
	CEAP campaign publicity and related activities - (radio talkback, press releases, photo opportunity): theme 2	MO, PIA
	Organise media tour of the sewage treatment facility	MO, WSD
	Develop programme for TV children’s programme (‘Get Set’) and air (based on CEAP campaign theme)	MO, PIA
	Develop and publish second ‘Mr Paniwallah’ column	MO, PIA
	Third monthly internal news-sheet	MO
September	Ongoing CEAP Theme 2 activities	MO, PIA
	Organise regular radio schedule with major radio stations and conduct first program (three languages)	MO
	Conduct Incident Management Workshop (continued)	CRA, MO, WSD senior managers
	Develop and publish third ‘Mr Paniwallah’ column	MO, PIA
	Fourth monthly internal news-sheet	MO

Date	Activity	Responsibility
October	Ongoing CEAP Theme 2 activities	MO, PIA
	Organise second media conference around a successfully completed WSD activity	MO
	Write and publish second feature article	MO
	Second radio programme	MO
	Develop and publish fourth 'Mr Paniwallah' column	MO, PIA
	Fifth monthly news-sheet	MO
November	CEAP campaign publicity and related activities – (radio talkback, press releases, photo opportunity): theme 3	MO, PIA
	Develop programme for TV children's programme ('Get Set') and air (based on CEAP campaign theme)	MO, PIA
	Conduct Incident Management Workshop (continued)	CRA, MO, WSD senior managers
	Third radio programme	MO
	Develop and publish fifth 'Mr Paniwallah' column	MO, PIA
	Sixth monthly internal news-sheet	MO
December	Ongoing CEAP theme 3 activities	MO, PIA
	Review the public relations programme and amend as needed. Develop detailed annual work plan and budget for upcoming year	All communications staff and management
	Fourth radio program	MO
	Develop and publish sixth 'Mr Paniwallah' column	MO
	Seventh monthly internal news-sheet	MO

Table 4.6 details regular activities. These activities are to be continued (subject to evaluation and review) into the following long-term plan. This plan provides more general activities that are to be developed, implemented and evaluated in addition to the regular activities.

**Table 4.7 2007 – January to April**

Date	Activity	Responsibility
January	Ongoing CEAP theme 3 activities	MO, PIA
	Write and publish third feature article	MO
	Fifth radio program	MO
	Conduct Incident Management Workshop (continued)	CRA, MO, WSD senior managers
	Develop and publish seventh 'Mr Paniwallah' column	MO, PIA
	Eighth monthly internal news-sheet	MO
February	CEAP campaign publicity and related activities - (radio talkback, press releases, photo opportunity): theme 4	MO, PIA
	Sixth radio program	MO
	Develop and publish eighth 'Mr Paniwallah' column	MO, PIA
	Conduct Incident Management Workshop (continued)	CRA, MO, WSD senior managers
	Ninth monthly internal news-sheet	MO

Date	Activity	Responsibility
March	Ongoing CEAP theme 4 activities	MO, PIA
	Develop incident debrief procedure and implement and train staff	CRA, MO, WSD senior managers
	Organise third media conference around a successfully completed WSD activity	MO, PIA
	Seventh radio program	MO
	Develop and publish ninth 'Mr Paniwallah' column	MO, PIA
April	tenth monthly internal news-sheet	MO
	Ongoing CEAP theme 4 activities	MO, PIA
	Eighth radio program	MO
	Develop and publish tenth 'Mr Paniwallah' column	MO, PIA
	Eleventh monthly internal news-sheet	MO

**Table 4.8 2007 – May to December**

Date	Activity	Responsibility
May	Evaluate activities in 14 month plan and incorporate into longer term plan	PIM/MO
	Appoint permanent position for Media Officer	WSD
June – August	Research topics for documentary	MO
September	Develop documentary for WSD with MoI	MO
October	Develop corporate image for WSD	PIM/CRA
December	Review the public relations programme and amend as needed. Develop detailed annual work plan and budget for upcoming year	PIM/MO
	Develop and implement internal public relations program for new image	PIM/MO
Throughout year	Activities as detailed in 14 month plan	Various

### Daily activities

A number of activities will need to be conducted under the public relations program on a daily basis. One of the most important is monitoring of media and general public feedback. A media-monitoring sheet has been developed and this needs to be completed at the beginning of each day. The MO will be responsible for screening all news articles and identifying issues of potential interest to the media. Public feedback from customer complaints areas can also help identify imminent issues to be addressed.

The MO must also take a pro-active approach to identifying media opportunities and building good relations with members of the media on a regular basis. This involves setting up photo opportunities, responding in a timely fashion to journalist enquiries and generally ensuring that WSD projects a friendly image to members of the media.

**Table 4.9 2008**

Date	Activity	Responsibility
January	Web site	CRA/PIM/MO
February	Style Guide	PIM/MO
June – August	Research topics for documentary	MO
December	Review the public relations programme and amend as needed. Develop detailed annual work plan and budget for upcoming year	PIM/MO
Throughout year	Activities as detailed in 14 month plan	Various

The Media Officer is also responsible for liaising with the media to effectively manage issues and during incidents. The responsibilities are detailed in the Media Policy and in Roles and Responsibilities in an Incident (Volume 4 – Appendix 31)

### **Specific activities as stated in the 14 month plan**

*Appoint Media Liaison Advisor (MO)* – Recruitment of this position will be essential to the implementation of the overall public relations program. The MO will be recruited on a short-term contract under the Loan project.

*Orientation of MO* – The Public Information Framework (PIF) and WSD’s media policy and guidelines have been developed in consultation with the WSD management and staff. Various approaches to public relations have also been tested during the implementation phase of the technical assistance project. It will be the responsibility of management to ensure that these documents are made available to the MO and other communication staff as part of their orientation to the WSD.

*Coordination meeting with other communication staff and management* – At least one meeting must be convened between the communication staff and management to coordinate activities and agree on implementation dates, campaign themes, etc.

*Convene internal briefing meetings with key staff on media policy and the communication framework* – These briefings will help raise awareness amongst key WSD staff on the content of the media policy and the specific roles and responsibilities of these staff.

*World Water Day (23 March)* – World Water Day presents an opportunity for WSD to show its services in a positive light. An exhibit was displayed at the 2005 WWD and it was agreed that this type of activity was desirable for the WSD. Due to time constraints, it is recommended that for 2006, WSD provide CEAP materials as giveaways and use the various posters for an exhibit. A more specific and permanent exhibit should be developed for future use. The coordinating body for WWD in Fiji is SOPAC.

*Trade waste publicity* – Publicity programme will be developed to highlight the launch of the trade waste programme and signing on of first trade waste customer. Basic strategies such as a media conference, press release, information sheet, radio and television interviews should be part of the programme.

*Develop press kit and FAQ sheets on the WSD and current issues* – Current issues of public and media interest should be identified and a list of frequently asked questions (FAQ) needs to be developed to address these issues. The FAQ sheet can be

handed to the media as and when required. The FAQ sheet will also provide general information for in-house use. A press kit for distribution to the media should be produced and added to as necessary. The press kit should include at least the following: information on the WSD (CEAP materials); correct names and titles of Minister, CEO and Director; information on current projects and activities; and any current press releases. Contact details of the MO should also be provided.

*Convene individual meetings with key journalists and media outlets and update media contact list* – This will be an ongoing task to be conducted at the MO's discretion however an initial set of meetings will help develop positive relationships and identify journalists with particular interest in WSD issues. Links with journalists at the Ministry of Information should be cultivated. The media contact list should be updated regularly to ensure that journalists can be easily contacted when necessary.

*Identify available television, radio and newspaper opportunities for public announcements and delivery of key messages* – There are many opportunities in the media for 'free' advertising. These should be identified at an early stage and efforts made to develop a schedule for utilising such opportunities. Paid media slots will also be necessary and these should be negotiated and purchased in bulk once the public relations programme is well established.

*Prepare draft press releases on water conservation in dry season* – Prepare simple press releases and other public advisories to reduce water use during dry and potential drought period. These should be used as required and well before water levels in the rivers begin to fall. Communication with the water supply engineers is essential.

*CEAP campaign publicity and related activity* – The community education and awareness programme will conduct several campaigns on key issues for WSD. These will include water conservation, health and sanitation, the water system, etc. The public relations programme will help disseminate these messages through an organised series of radio talkbacks, press releases, photo opportunities and other tools.

*Media conferences* – Identify at least two opportunities for a media conference around completed WSD works. The trade waste publicity provides one opportunity, as will other projects nearing completion. Focus should go beyond the Suva-Nausori project and a press conference in the Western Division is suggested.

*Management and staff training on media involvement* – One training workshop was conducted under the TA for management personnel. The MO and PIM will run an in-house professional development programme for key personnel in public speaking, interview skills and media relations.

*Develop and set in place a daily briefing system for WSD* – An effective internal communications system is required to ensure the MO receives daily updates from each division of the WSD. The daily updates will provide an idea of possible stories of interest to the media and will also be used to compile a monthly newssheet for WSD staff. This will be done on a trial basis initially.

*Develop and distribute internal newssheet based on daily briefs* – use the daily briefs to compile a 'news-sheet' of events and issues of interest for WSD staff. The TA found that the most appropriate mechanism for distribution of information was word-of-mouth (briefing meetings, etc). The newssheet provides a written record of events and its usefulness should be evaluated early (and the mechanism revised as appropriate).

*Develop generic exhibit* – The public relations and CEAP staff will develop a generic display of posters and other material to highlight the services of the WSD. Display boards or other display media will be required. An exhibition schedule should be developed to ensure the greatest possible use of the exhibit.

*National Environment Week* – Environment Week is the responsibility of the Department of Environment and is an annual national event. Involvement of the WSD should be early in the process, possibly through the planning committee. WSD will need to identify where it can input to the event as well as ensuring the organisation is ‘seen’ during the event.

*Develop ‘Mr Paniwallah’ concept and establish newspaper schedule* – The ‘Mr Paniwallah’ monthly column concept is a question and answer approach to providing the public with information on the WSD and its activities. Initially, a series of questions (in the form of an open letter) will be developed and answers provided by WSD. The public will be invited to write in their own questions. This should also serve as a simple evaluation mechanism. It is recommended that at least four months worth of material be collated before developing an agreement with the publishing company (Fiji Times or Fiji Sun). The concept can be built on and further developed depending on the feedback received.

*Incident management planning workshops* – These planning workshops will enable WSD to better deal with communications during a crisis situation. Refer to the training modules for these workshops and Volume 4 – Appendix 30 for a work instruction on how to carry out the workshop.

*Feature articles* – At least feature articles should be written for publication in a major national newspaper or journal (eg. Fiji Islands Business). The articles should profile successful projects or other positive stories of the WSD. Effort should be made to identify interested journalists to write these articles and publish under their own name.

*Media tours* – A media tour of the water operations was conducted successfully under the TA 4270. A tour of the sewage treatment plant will help raise awareness on sewage issues. These tours can be timed to coincide with special events (such as national environment week) or the completion of some relevant project.

*Develop program for TV children’s program (‘Get Set’) and air (based on CEAP campaign theme)* – The TV program ‘Get Set’ presents an opportunity to target school aged children and raise awareness on water conservation and sanitation issues. Discussions with the producer will be necessary to establish relationships and develop appropriate programs.

*Radio programs* – Organise monthly radio talk back programme on water and sanitation and provide information on current activities at WSD. Radio programmes should be conducted in the three main languages. Staff at WSD will need to be identified to conduct these programmes. These may be the community liaison officers or the MO or PIM.

*Develop incident debrief procedure and implement and train staff* – Procedures and standard forms have been developed for many of the standard incidents. Develop, document and implement a procedure on how to carry out a debrief of an incident. The aim of the debrief is to analyse an incident, after it has been completed, to look at what improvements could have made in how the incident was managed and incorporate and implement changes to improve the management of future incidents.

### **Long-term activities**

A number of activities will require more long-term input. These include:

- documentary on WSD – Develop a documentary video on the WSD highlighting the services provided and the water supply and sewerage systems
- develop a corporate image for WSD
- develop an appropriate ‘image’ that the WSD intends to present to its clients and other audiences. The image will involve developing a distinctive logo that will assist in branding the WSD as an efficient and customer-focused provider of water and sanitation in the country. The logo will be used on all project communications and educational material produced
- develop and implement internal public relations program for new image- any new image for the organisation will require a detailed internal public relations campaign, particularly in educating about vision and mission statements
- style guide – develop a style guide to provide instructions and directions about the use of the WSD logo, donors’ logos, WSD graphic designs, banners, newsletters and any other materials and style features that will require consistent formatting and instructions for treatment
- web site – develop a web site for WSD. A WSD web site has the potential to reach a range of audiences both within Fiji and beyond. The site will disseminate information relating to WSD activities, advertise employment opportunities and provide access to education and awareness material. The site can also be used to provide links to other national partners and stakeholders. Designing and maintaining a website is an expensive commitment and this should be undertaken only when WSD is confident of personnel and financial support to ensure information on the site is updated at least every two months.

## **4.5 RECOMMENDATIONS FOR EXTERNAL RESOURCES AFTER COMPLETION OF TA 4270**

The need for external resources in addition to the new appointments has been mentioned throughout this report. The following external resources are recommended to assist WSD with the short and long-term implementation of their customer relations and public relations programs.

### **4.5.1 Short term**

Some external assistance is required to train the new appointments (due in March 2006). The training will be to orientate the appointments to the requirements of their new positions, the tasks to be carried out in accordance to the implementation timetable and the customer service and media policies. These staff will be required to implement these policies. The other aim of the training will be to address any gaps in their knowledge and ability to carry out the tasks in their positions description and the implementation timetable. Some time during the training phase and a couple of days during the evaluation week will also be required to work with the PMU Reform Consultant.

### **Training**

- *Media Officer* – three weeks (one week international consultant, two weeks local consultant)
- *Customer Officer* – two weeks (international consultant) It is anticipated that the PMU Reform Consultant will also work closely with this appointment
- *Customer Relations Advisor* – two weeks (one week International, one week PMU Reform Consultant). It is anticipated that the PMU Reform Consultant will work quite closely with this appointment.

### **Evaluation**

- *Public relations* – two weeks (Local)
- *Customer relations* – three weeks (one week International, one week international (in Australia), one week local consultant).

### **Long-term**

Long-term, there are concerns about the implementation of the customer service at the ‘grass-roots’ level. At the completion of the institutional reforms, an evaluation should be made to determine whether individuals within the organisation are able implement the required changes. A complete assessment of all procedures within the organisation is required and changes need to be made in the procedures that require interaction with customers on a day-to-day basis. Currently, there is no one within the organisation with the ability to drive this process. It is anticipated that the Communications Officer would be the individual to coordinate this process but it is likely that external support may be required. This should be considered at the evaluation phase and towards the end of the implementation phase for the institutional reforms.



# 5 Environmental management

## 5.1 REPORT OBJECTIVE

This section of the Final Report:

- describes the work undertaken on the environment legislation/management component since the Interim Report
- summarises the progress made in fulfilling the terms of reference required in the TA
- includes the proposed work programme for the TA extension.

## 5.2 ACTIVITIES SINCE THE INTERIM REPORT

Principal activities since the preparation of the Interim Report have included:

- continuing consultations with the Department of Environment (DoE), Ministry of Health (MoH) on institutional needs of the Environmental Management Act (EMA)
- completion of a Strategy Document on Regulations for Liquid Waste Discharges for the EMA; limited circulation to DoE, peer reviewers and additional government regulatory authorities (CBH, Councils – those implementing the Public Health Act; incorporate comments to third draft)
- drafting of an Implementation Plan for the Liquid Waste Discharges for the Environment Management Act; limited circulation (as for 2 above)
- collation of NWQL data on effluent quality of the principal STPs and some receiving waters
- sampling of the effluent quality of the Tamavua and Waila Water Treatment Plants
- meetings with TA team members and PMU reform team.

### 5.2.1 Strategy for the regulations for liquid waste discharges under the Environmental Management Act

The revised TORs for the Environment Legislation Specialist under the TA determined greater consultation with DoE on the implementation of the EMA. In respect of WSD, development of their environmental management capability is severely limited until such time as:

- personnel are recruited
- the regulations of the EMA are introduced which provides WSD with clear understanding of their compliance requirements.

During the period, TA personnel have participated in the on-going consultation led by DoE on the EMA and its regulations. At the interim report stage of the TA, DoE had not

formulated any clear direction for the regulations of the Act, specifically Part 5, Waste Management. At DoEs request, the TA has taken the lead through the actual preparation of an approach and an implementation plan. The first document prepared was drafted to introduce an approach and an implementation strategy for the control of liquid waste discharges under Part 5 of EMA (refer Attachment 1). Initially, it was circulated internally in DoE and with peer reviewers. After receiving DoEs endorsement for circulation, it was circulated among the other involved regulatory authorities involved in liquid waste management, specifically the Central Board of Health (CBH) and the Councils. Final comments have yet to be received from DoE, when these are received, a brief will be prepared for the Legal Draftsperson of the regulations.

This document deals only with liquid waste discharges, however, the approach adopted would enable the other components of Part 5 of EMA (solid waste, landfill management, air emissions, storage and/or generation of hazardous materials) to be included in a wider brief.

### **5.2.2 Implementation plan for the regulations for liquid waste discharges under the Environmental Management Act**

Following endorsement by DoE of the approach adopted in the strategy paper, a draft Implementation Plan for the regulations for liquid waste discharges under the EMA has been prepared (refer Attachment 2).

The Implementation Plan acknowledges that DoE will not receive sufficient resources from the Government to implement fully the EMA by itself, rather the field administration will be undertaken by the 87 Environmental Health Inspectors (EHI) in local authorities and municipal councils who come under the Ministry of Health's Central Board of Health. Government has made it clear it wishes to downsize, not increase, the Civil Service and so it is no real surprise that DoE has recently received only five new positions based on a request of a minimum of 15 positions of the 59 positions it believes it requires to implement fully the EMA.

The EHIs currently administer all development control at the field level under the Town Planning Act as well as several other pieces of legislation, they have the academic background to perform the EMA duties (with some additional training) and they are very well spread throughout the country.

Resources required to implement the plan are not great because all local personnel costs are already provided for and the EHIs do not require significant training as the activities to be performed are similar to those they already perform. There will be a need for additional training, additional transport, communications, some field analytical equipment and IT. DoE requires significant capacity rising in regulatory implementation of effluent discharges/pollution control. This is best achieved through on-the-job training with a specialist recruited to work with DoE for a minimum of two years. If possible this should be done through a partner arrangement with a regulatory authority in Australia or New Zealand which should enable DoE officer(s) to spend some time in the host country as well. The less preferred option would be the recruitment of consultant assistance on a management services contract.

DoE and the CBH, and councils, will need to draw up service agreements to ensure that the administrative and communication arrangements are clearly understood.

### **5.2.3 Draft codes of environmental practice**

Draft codes of environmental practice for WSD were completed and presented to WSD during the Interim Phase. Further discussion with the Director, WSD was undertaken and it was confirmed that WSD would prefer that the Draft COEPs are completed with the active involvement of their Environment Manager, when recruited.

## **5.3 PROGRESS TOWARDS FULFILLING TOR REQUIREMENTS**

The TOR for the environmental legislation/management component of the TA were revised after the Inception Report as follows:

- review the Environmental Management Act and identify any weaknesses, and if required, develop a legislative brief or briefs and consult with key decision makers
- assist the WSD/WSC in developing conformance with the Environmental Management Act through the drawing up of a Code of Environmental Practice
- review the Public Health Bill in relation to the Environmental Management Act; and identify areas of overlap
- review other relevant legislation including the Water Supply Act, Sewerage Act (and amendments), Mining Bill, Water Bill and others as identified, and, if appropriate, prepare legislative briefs to amend weaknesses
- undertake an assessment and make recommendation in regard to the institutional capacity (technical, financial and human resources) of the agencies with primary responsibilities for environmental regulation and administration (DoE, DTCP, MoH rural authorities)
- consult with the involved agencies including MoH, MLGHSSE, and the Public Services Commission and develop a consensus for short-to medium term solutions and potential long-term solutions for appropriate institutional arrangement/staffing for the effective implementation of the Environmental Management Act
- provide advice and assistance to PWD, as required, in developing the TOR for the environmental monitoring of the loan project.

Table 5.1 demonstrates progress against these outcomes.

## **5.4 PRELIMINARY WATER QUALITY ANALYSES OF SEWAGE TREATMENT PLANT EFFLUENT, WATER TREATMENT PLANT EFFLUENT AND RECEIVING WATERS**

### **5.4.1 Background**

Two priorities identified as part of an assessment of WSDs obligations under the Environmental Management Act<sup>2</sup> were to monitor WSD's effluent discharges to the environment and to determine their environmental effects. WSDs principal discharges are:

- effluent discharges from the sewage treatment plants
- sewerage overflows
- effluents and sludges from the water treatment plants.

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<sup>2</sup> Appendix to Environment section of TA 4270-Fiji [Interim Report](#)

**Table 5.1 Project achievement and outcomes summary – environment legislation component**

TOR	Level of achievement	Outcomes	Challenges
Review the Environmental Management Act and identify any weaknesses, and if required, develop a legislative brief or briefs and consult with key decision makers	Complete	Review brief Participated in all DoE and other agency consultations on introduction of Environmental Management Act Determined WSD's priority needs DoE endorsed approach for liquid waste regulations – Strategy Paper (Attachment 1) Environmental Management Act Regulations Implementation Plan (Attachment 2)	DoE finding resources for legal draftsmen to prepare regulations
Assist the WSD/WSC in developing conformance with the Environmental Management Act through the drawing up of a Code of Environmental Practice	Complete	Draft COEPs completed and accepted by DoE	WSD unable to appoint staff with trade waste responsibility until at least March 2006
Review the Public Health Bill in relation to the Environmental Management Act; and identify areas of overlap	Complete	Review brief Further consultation with CBH – no current plans to pursue enactment of Public Health Bill 2004	
Review other relevant legislation including the Water Supply Act, Sewerage Act (and amendments), Mining Bill, Water Bill and others as identified, and, if appropriate, prepare legislative briefs to amend weaknesses	Complete (except for Mining Bill and Water Bill – not released)	Water Supply Act, Sewerage Act, Public Health Act, Town Planning Act, Local Government Act reviewed (incorporated in Interim Report) Legislative brief for Sewerage Act prepared	
Undertake an assessment and make recommendation in regard to the institutional capacity (technical, financial and human resources) of the agencies with primary responsibilities for environmental regulation and administration (DoE, DTCP, MoH-Rural Authorities)	Complete	Preliminary assessment incorporated in Interim Report Final assessment and derived requirements in 'Regulations Implementation Plan'	Harmonious DoE and CBH relationship. Appropriate service agreement drawn up.
Consult with the involved agencies including MoH, MLGHSSE, and the Public Services Commission and develop a consensus for short-to medium term solutions and potential long-term solutions for appropriate institutional arrangement/staffing for the effective implementation of the EMA	Complete	Consultations undertaken PSC has provided five positions to DoE for 2006. (DoE request was for a minimum of 15 of the 59 required). EMA Regulation Implementation Plan	Harmonious DoE and CBH relationship to use the EHIs to administer the EMA at the field level

TOR	Level of achievement	Outcomes	Challenges
Provide advice and assistance to PWD, as required, in developing the TOR for the environmental monitoring of the loan project	Not required by PWD		

Compilation of existing data, augmented by a credible monitoring programme are the minimum data requirements needed to determine:

- operating performance of the STPs and WTPs
- compliance with the EMA (when the regulations are promulgated)
- for inclusion in the State of the Environment Report (an EMA requirement).

Currently, the Kinoya NWQL irregularly monitors the quality of effluent being discharged from the various sewage treatment plants (STPs) as well as the receiving waters of the major ones. They do not, however, monitor wastewater being discharged from the WTPs although they have been planning to start this.

As part of the environmental management component of TA 4270, some of this data was collated as a preliminary assessment of the effluent quality (refer Attachment 3). In addition, samples were collected from the Tamavua and Waila WTPs and analysed at the NWQL. These data will be useful in the formulation of a full monitoring programme for the WSTs, WTPs and receiving waters.

#### 5.4.2 Summary of results

##### STPs

The results indicate that for most of Fiji's STPs, the standard of effluent being discharged into the environment is poor:

- for the old Kinoya STP, effluent is significantly above the recommended guidelines for six of the nine parameters assessed (BOD, TN, ammonia, sulphide, oil and grease and faecal coliforms)
- for the new Kinoya STP, effluent is significantly above recommended guidelines for three of the nine parameters assessed (TN, sulphide and faecal coliforms)
- for the old Nadi STP, effluent is significantly above the recommended guidelines for seven of the nine parameters assessed (BOD, TSS, TN, ammonia, sulphide, oil and grease, faecal coliforms)
- for the new Nadi STP, effluent is significantly above the recommended guidelines for six of the nine parameters assessed (BOD, TN, ammonia, sulphide, oil, grease and faecal coliforms)
- for Lautoka STP, effluent is significantly above the recommended guidelines for four of the nine parameters assessed (BOD, ammonia, oil and grease and faecal coliforms)
- for Sigatoka STP, effluent is significantly above the recommended guidelines for four of the nine parameters assessed (TSS, sulphide, oil, grease and faecal coliforms)

- for Ba STP, effluent is significantly above the recommended guidelines for three of the nine parameters assessed (ammonia, oil, grease and faecal coliforms)
- for Nausori STP, effluent is significantly above the recommended guidelines for four of the nine parameters assessed (TN, sulphide, oil, grease and faecal coliforms)
- for Wailada STP, effluent is significantly above the recommended guidelines for three of the nine parameters assessed (sulphide, oil, grease and faecal coliforms)
- for Labasa STP, effluent is significantly above the recommended guidelines for three of the nine parameters assessed (sulphide, oil and grease and faecal coliforms).

STPs with the worst effluent quality appear to be those that are running close or above maximum capacity and which are servicing large urban populations and industrial areas such as Kinoya STP (specifically the old trickling filter plant), and/or fast growing service areas, the Nadi STP.

Lautoka, Sigatoka and Nausori STP are producing effluent of better quality, though still not complying with appropriate guidelines. The Ba and Labasa STPs seem to be producing the best effluent quality at present however they are servicing small populations and little industry. For all STPs the parameters which were most commonly above guidelines were sulphide, oil and grease, and faecal coliforms.

### **STP receiving waters**

Considerably more analysis of the receiving waters is required before an accurate determination can be made of the impact of STP discharges on the environment. The data available indicate that discharges are diluted at relatively short distances away from the discharge point. This appears to be the case at Kinoya, Fiji's largest STP where good circulation in Laucala Bay and the dominant SE tradewinds probably assist. The situation is similar at Natabua (Lautoka). Similarly, water quality quite close to the Rewa River and Sigatoka outfalls are fairly good and improve rapidly with distance away. In contrast, where the discharge is into small rivers with little water movement such as the Nadi and Lami Rivers, effluent concentrations remain high for some distance.

### **Water treatment plants**

All water treatment plants effluents are discharged directly to the environment either as liquid sludges or liquid discharges. They are very high in Total Suspended Solids (3000–7000 mg/L), especially from the clarifier drawoff. These levels are clearly having an impact on the receiving water body; though more work needs to be done on the receiving waters to determine the level of impact.

Copper was also found to be present in both the clarifier drawoff and filter backwash although higher in the clarifier sludge, this probably reflects continued use of Copper Sulphate as an algicide<sup>3</sup> (as observed during the TA at Tamavua). Iron was also present in the clarifier drawoff. Lead and oil and grease were also present in the clarifier drawoff effluent from Waila.

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<sup>3</sup> *The use of copper sulphate for this purpose is banned in most developed countries and should be discontinued by WSD. It will certainly have to be when the EMA comes into force.*

## 5.5 IMPLEMENTATION TIMETABLE

### 5.5.1 Work programme for TA 4270 project extension

Two activities have been recommended for the extension of the environment legislation/management component of TA 3270 in 2006, they are:

- preparation of a Draft Permit for the discharges of WSD as a Significant Discharger, under the proposed regulations of the EMA
- on the job training for WSD's newly appointed Environment Manager.

The activities during the extension, as summarised in Table 5.2, will be largely determined by the appointment or not, of WSD's Environment Manager and the promulgation of regulations for the EMA, or at least the very clear indication from DoE of the detailed nature of the regulations. At this stage DoE have accepted the approach for the regulations, as outlined in Volume 5 – Appendix 1, but this may be modified during the period of consultation.

In the absence of an appointment of a WSD Environment Manager it would be possible to draw up Environment Management Plans for WSD's STPs and WTPs but in the absence of the on-the-job training component. They would then act solely as examples of what would be required.

Originally, these activities were estimated to require approximately four months of international expert input, however, only one and a half months of international expertise and three months of local expert input have been allocated. As a result of this not all can be accomplished.

**Table 5.2 Project extension activities – environment legislation component**

Subject	Activities and outcome	Conditions or prerequisites
Preparation of a Draft Permit for the discharges of WSD as a Significant Discharger, under the EMA Regulations	Determine permit structure for a 'Significant Discharger'	Following consultation, promulgation of EMA Regulations by DoE as currently envisaged with WSD becoming a Significant Discharger; or, at least clear indication of intent or similar alternative
	Determine DoE requirements for Significant Discharger with multiple discharge points	
	Draw up draft waste reduction programme for WSD for Greater Suva	
On the job training for WSD Environment Manager	Develop standard operating procedures and guidelines for COEPs with WSD Environment Manager based on field training	Appointment of WSD Environment Manager
	Prepare EMPs for major WSD's STPs and WTPs	Best following appointment of WSD Environment Manager, but could be undertaken in his/her absence

### 5.5.2 WSD's Environment Management Implementation Programme for 2006–07

The tables below represent the timetable for WSD's environment implementation programme. The activities are defined in greater detail at the end of each calendar year table.

**Table 5.3 2006**

Date	2006 activities	Responsibility
February	Preparation of a Draft Permit for the discharges of WSD as a Significant Discharger	Technical resource/DoE
	NWQL to initiate comprehensive monitoring programme of WSD effluent discharges	WSD/TA 4270 Receiving Water Monitoring Programme
March	Appoint Environment Manager	WSD/PMU reforms
	Confirm reporting lines	WSD/PMU reforms
	Determine administrative procedures	Technical resource/WSD
April – May	Initiate on-the-job training for Environment Manager: COEP	Technical resource/WSD
	Environment Management Plans (EMPs) – STP; WTP	
June-August	Environment Manager completes Draft COEP compilation and EMPs for all Viti Levu STPs and WTPs	WSD
September	Finalisation of COEPs and EMPs	
	Confirm EIA arrangements with Department of Environment and Department of Town and Country Planning	Technical resource/WSD
October–December	Implementation-familiarisation of COEPs throughout WSD plants	
	Establishment of environment committees	WSD
	Initiate monitoring programme of WSD facilities discharging effluent to the environment	

### Activity statements

*Preparation of a Draft Permit* – The preparation of a Draft Permit under the EMA as a Significant Discharger, will be undertaken by the international expert in consultation with DoE. The potential to do this will depend on the EMA Regulations being promulgated and/or DoE confirming that the current (or an alternative approach) is endorsed. The timing of this input can be variable and so, the status of the Regulations will need to be reviewed at the end of January to see if this component should proceed.

*Appoint interim trade waste staff* – As permanent staff will not be in place until the reform is further progressed, WSD has proposed developing an interim position as an ‘Environment Management Advisor’. This position would be filled on a term basis. It is anticipated that the necessary approvals and appointment will occur by March 2006.

*Confirm reporting lines* – The Environment Management Unit will ultimately be within the Directorate of Policy, Planning and Development function, but the new institutional arrangement may not be operating at this time and so reporting lines and administrative linkages will need to be made.

*Determine administrative procedures* – Work is required to develop a consistent administrative system to ensure that the work of the Environment Manager and his unit is fully supported by the upper management to enable an environmental management culture to be adopted by WSD.

*Initiate on-the-job training for Environment Manager* – TA 4270 will assist the Environment Manager take ownership of the COEPs and work with him to develop them



fully for finalisation. Two EMPs should also be undertaken by the Environment Manager together with TA 4270 staff as a training exercise. It is recommended that two of the larger facilities be chosen, probably Kinoya and Waila.

*NWQL to initiate a comprehensive monitoring programme* – NWQL will review the results of existing data on STP and WTP discharges and the receiving waters, and develop a full monitoring programme to determine the impacts of WSDs discharges. The receiving waters programme will be undertaken by TA 4270 in conjunction with NWQL.

*Develop draft COEPs for finalisation* – This will require half day workshops in various localities to introduce the COEP to WSD staff and gather information on the necessary standard procedures which should be incorporated into the COEPs. This will be followed up by adapting existing standard procedures or drawing up new ones to develop the COEP. Project expertise will assist at the beginning of the COEP work, it will then be carried on by the Environment Manager himself and the TA will assist at the end to review the Draft Final and assist in its finalisation.

*Establish environment committees* – WSD is required to establish environment committees in each of its major facilities under the EMA. This should be undertaken as a part of finalising the COEPs and then COEP training thereafter. The committees would be charged with ensuring adequate feedback is generated on COEP implementation, especially problems encountered.

*Confirm EIA arrangements with Department of Environment and Department of Town and Country Planning* – Without guidelines, the EMA can be interpreted as requiring an EIA for almost any physical works. WSD will need to liaise with DoE and come to an understanding on which of its works will require a full EIA and which can be managed through an EMP. Resolution of this will be assisted by the fact that WSD is developing COEPs. In turn, the agreement will need to be incorporated into the COEPs.

*Conduct training for WSD staff* – Once the COEPs have been finalised and endorsed by WSD, it will be essential to conduct a series of training workshop with all WSD staff. This training will cover all aspects of the COEPs with the objective of integrating the COEPS into ‘core’ WSD management. This training will be a key part of WSD assuming ownership and responsibility for the COEPs and their implementation.

**Table 5.4 2007 activities**

Date	2007 activities	Responsibility
January	Appoint permanent environment management staff	WSD/PMU reforms
	Conduct COEP implementation audits and training	WSD
	NWQL continue STP and WTP effluent discharge monitoring programme with TA4270 Receiving Waters Programme	WSD/TA 4270 Receiving Water Monitoring Programme
July	Initiate EIA programme of gazetted sewerage areas in respect of impacts of overflows and discharges to develop WSD's Overflow Management Plan	WSD/will require twinning/partner assistance or, alternatively consultant support

### **Activity statements**

*Appoint permanent trade waste staff* – The reform process should be finalised to the point where the permanent staff recommended under TA 4270 can be deployed. The Environment Management Unit is comprised of a Manager and one Environment Officer.

*Conduct COEP implementation audits and training* – The Environment Manager will conduct internal audits of COEP implementation and follow it up with ‘pocket’ training workshops where necessary.

*Initiate operational EIAs of each sewerage area* – Once the STP and WTP effluent discharge Monitoring Programme has been running for a year, the Environment Manager will use the collected data to undertake an ‘operational’ EIA of all the sewerage areas to characterise WSD’s current impacts on the environments from discharges and overflows. These EIAs will be the basis of drawing up a capital improvement, and Overflow Management Plan which will be central to WSD’s Discharge Permit from DoE. WSD will need consultant assistance with the EIAs and the formulation of the Overflow Management Plan. This assistance could come from the same twinning arrangement as may be arranged under the trade waste programme.

#### **5.5.3 Implementation programme for DoE – Environment Management Act regulations: 2006–08**

A two and a half year period is envisaged before the regulations come fully into force with the Interim National Effluent Standards effective. This incorporates a two year phase-in or grace period during which time; facilities have time to comply with the effluent standards. Figure 5.1 provides a timeline illustrating major activities and milestones.

A detailed implementation plan is appended as Volume 5 – Appendix 2.

	2005		2006												2007												2008											
	N	D	J	F	M	A	M	J	J	A	S	O	M	D	J	F	M	A	M	J	J	A	S	O	M	D	J	F	M	A	M	J	J	A				
REGULATIONS																																						
Finalise Draft	X	X																																				
Legal Drafting					X	X																																
Minister Signs Part 5 of EMA into force								X																														
Minister Signs Regulations into Force								X																														
Phase-in Period - Permit Application Period									X	X	X	X	X	X	X	X	X	X	X	X																		
Facilities in sewerage areas to discharge to sewer									X	X	X	X	X	X	X	X	X	X	X	X																		
Discharging Facilities without Permit IN BREACH																					X	X	X	X	X	X	X	X	X	X	X	X	X	X				
National Effluent Standards Grace Period									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
National Effluent Standards In Force																																				X	X	
CONSULTATION																																						
Government & Councils	X	X																																				
Public			X	X	X																																	
DEPARTMENT OF ENVIRONMENT																																						
Appoint WPC Administrator			X																																			
Appoint WPC Environment Officer			X																																			
Establishment of Environment Tribunal								X																														
Appoint EHIs to administer EMA								X																														
Locate Management Services Partner or Contractor			X	X	X	X	X	X																														
Appoint Management Services Partner or Contractor									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
DoE to negotiate Service Agreement with CBH & Councils			X	X	X	X	X	X																														
Service Agreements in place									X																													
Process Permit Applications received from EHIs										X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Undertake Spot Audits of Facilities															X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Identify all Significant & Livestock Dischargers									X	X	X	X	X	X	X	X	X	X	X	X																		
Negotiate Effluent Management Plans - SD & LD															X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
SD & LD without Approved EMP In BREACH																																				X	X	
Preparation of Standard Procedures									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															
CENTRAL BOARD OF HEALTH - EHIs																																						
Service Agreement Negotiations with DoE			X	X	X	X	X	X																														
Undertake internal organisation review for EMA					X	X	X	X																														
Outreach to Facilities in respect of Pemits and EMA									X	X	X	X	X	X																								
Receive and Process Permit Applications for DoE									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Facility Inspections, Compliance Audits, Annual Inspections															X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
TRAINING																																						
Doe & CBH Familiarisation of Facilities with Discharges				X																																		
Four EMA Training Workshops for EHIs							X	X																														
DoE Env. Officer & CBH SHI - Formal Effluent Mgmt Course																																						

**Figure 5.1**  
**Timeline for the implementation of Environment Management Act Liquid Discharge Regulations**

# 6 Occupational health and safety

## 6.1 REPORT OBJECTIVE

As part of the capacity building requirements of TA 4270, a new occupational health and safety (OHS) policy and OHS management system, have been proposed for the Fiji WSD.

The purpose of this report is to:

- demonstrate the progress made in fulfilling the terms of reference required in the TA
- provide WSD and the associated parties a plan for the implementation of a sustainable OHS Policy and management system.

Given the timing of the document, a number of assumptions have been made:

- The reforms within WSD will occur
- interim staffing arrangements will be approved by the Public Service Commission (PSC).

A very large number of procedures have been presented to WSD for consideration and endorsement. Not surprisingly, this review process will take a considerable time and although there appears strong informal support for the outputs produced, formal endorsement is still awaited – a delay compounded by the lack of counterpart staff.

The OHS policy and OHS management system have been developed at a ‘high level’ to provide WSD with the beginnings of a sustainable framework for managing OHS performance. There are a number of activities required to finalise the OHS policy and OHS management system and to ensure smooth implementation which will require this formal endorsement and counterpart staff engagement. These activities have therefore been included within the proposed implementation timetable for future activities.

## 6.2 PROGRESS TO FULFILLING TOR REQUIREMENTS

The amended TOR listed the following specific outcomes of the OHS component:

- in consultation with WSD develop an appropriate OHS management system strategy to support a sustainable OHS capacity in WSD
- in consultation with WSD develop procedures appropriate to a water and wastewater utility in support of the OHS management system strategy
- identify areas of current operations that present a significant or immediate risk for health and safety and develop appropriate procedures, responses and actions to manage this risk.

To achieve the outcomes of the TOR a work plan was outlined in the interim report and the Table 6.1 details progress against the TOR and work plan.

In meeting the requirements of the TOR several reports outlining the existing OHS performance at WSD have been produced. These reports have been included with the OHS management system documentation in Volume 6 – Appendix 1 as a comprehensive report to provide the rationale and context for the OHS Policy and OHS management system corporate procedures.

In the absence of existing dedicated OHS resources and an OHS counterpart at WSD, the focus of the OHS TA has been on the development of framework tools and procedures. These framework documents set the direction and commitment for OHS management in WSD and provide the tools for achieving OHS compliance.

### **6.3 IMPLEMENTATION TIMETABLE**

The OHS policy, management system and procedures provide the overall framework for establishing a sustainable culture for OHS. A key to establishing the desired behavioural and culture changes will be ownership of the systems in WSD and time. From the outset the intention has been to provide the broad framework for improvement in OHS performance and establish changes in a structured and planned way over a period of three to five years. In order for the OHS programmes to be established therefore a number of activities must occur both over the short and long term.

Initial actions include endorsement and support of the system by WSD, and appointing resources to support and champion implementation throughout WSD. Training and awareness programmes utilising both printed materials, formal training and on the job training will form key components of the implementation plans for individual procedures that make up the OHS management system.

The tables below represent the timetable for the OHS programme. The activities are defined in greater detail at the end of each calendar year table.

**Table 6.1 Progress against the TOR and work plan**

Area of technical analysis	Level of achievement	Outcomes	Challenges
In consultation with WSD develop an appropriate OHS management system strategy to support a sustainable OHS capacity in WSD	Complete	<p>Baseline OHS reviews of various WSD sites, operations, remote locations and traffic management arrangements in the Eastern Central Division (refer to Volume 6 – Appendix 1)</p> <p>Review of OHS legislation in Fiji and assessment of WSD compliance. Legislative compliance report with priorities for recommended actions (refer to Volume 6 – Appendix 1)</p> <p>Review of OHS policy and management system requirements with recommendations for new OHS policy and management system structure</p> <p>OHS policy for WSD (refer to Volume 6 – Appendix 1)</p> <p>OHS management system manual for WSD (refer to Volume 6 – Appendix 1)</p> <p>Workshops and consultation on OHS Policy and OHS management system manual held in all divisions</p>	<p>OHS policy and management system manual not yet formally endorsed by WSD</p> <p>Workshops and consultation process not completed until end of October 2005</p> <p>WSD unable to appoint staff with OHS responsibility until March 2006</p>
In consultation with WSD develop procedures appropriate to a water and wastewater utility in support of the OHS management system strategy	Complete (Corporate OHS Procedures included in Volume 6 – Appendix 1)	<p>Hazard Identification and Risk Assessment Procedure</p> <p>Incident Management, Investigation And Reporting Procedure</p> <p>Personal Protective Equipment Procedure</p> <p>Safe Working in a Confined Space Procedure</p> <p>Isolation and Lockout Procedure</p> <p>Hot Work Procedure</p> <p>OHS Training And Induction Procedure</p> <p>Safe Systems of Work Procedure</p> <p>Emergency Response Planning Procedure</p> <p>Health Monitoring and Surveillance Procedure</p>	<p>OHS management system corporate procedures not yet formally endorsed by WSD</p> <p>Workshops and consultation process not completed until end of October 2005</p> <p>No OHS function currently in WSD</p> <p>Budget constraints may impact ability to implement procedures</p> <p>Significant training (management and supervisors) required</p>

Area of technical analysis	Level of achievement	Outcomes	Challenges
Identify areas of current operations that present a significant or immediate risk for health and safety and develop appropriate procedures, responses and actions to manage this risk	Complete	<p>OHS Consultation and Communication Procedure</p> <p>OHS Representatives and Committees Procedure</p> <p>OHS Performance Monitoring and Review Procedure</p> <p>Safe Working at Height Procedure</p> <p>Chemical Management Procedure</p> <p>First Aid Procedure</p> <p>Traffic Management and Vehicle Safety Procedure</p> <p>Workshops and consultation on OHS corporate management system procedures held in all divisions.</p> <p>Budget plans developed for implementation of minimum standards contained in corporate management system procedures.</p> <p>IT specification for OHS data requirements.</p>	
		<p>Procedures developed for significant risk areas: safe working in a confined space, working at height and chemical management (refer to Volume 6 – Appendix 1)</p> <p>Implementation plans for individual procedures can not be developed until endorsement of procedures</p>	<p>OHS management system corporate procedures not yet formally endorsed by WSD</p> <p>No OHS function currently in WSD</p> <p>Implementation plans for specific procedures to be developed</p>

**Table 6.2 Year 1 – 2006**

Date	Activity	Responsibility
January	Endorsement of WSD OHS Policy	WSD/TA 4270
	Endorsement of WSD OHS management system manual	WSD/TA 4270
	Endorsement of WSD corporate OHS procedures	WSD/TA 4270
	Management Awareness Training Session 1	WSD/TA 4270
February	Printed materials	WSD/TA 4270
March	Appoint interim OHS staff	WSD/PMU reforms
	Confirm reporting lines	WSD/PMU reforms
	Determine administrative procedures	Technical resource/WSD
	Conduct training for WSD OHS staff	Technical resource/WSD
	Launch OHS Policy	Technical resource/WSD
	Management Awareness Training Session 2	Technical resource/WSD
	WSD staff awareness training	Technical resource/WSD
	Trial key corporate OHS procedures:	Technical resource/WSD
	Hazard Identification Risk Assessment	
April	Working in a Confined Space	
	Safe Systems of Work	
	Incident Management, Investigation & Reporting	
September	Apply key corporate OHS procedures throughout WSD	WSD

### Activity statements

*Printed materials* – The following table details the type of general information printed materials that will be required for the initial implementation of the OHS programme. In addition to these general information materials there will be a need for other materials associated with individual corporate OHS procedures as detailed elsewhere in this report.

**Table 6.3 Printed materials that will be required for the initial implementation of the OHS programme**

Type of printed material	Title	Availability	Print run
Document (1 page)	OHS policy	WSD staff notice boards	150
Document (approx 250 pages)	OHS management system manual and corporate OHS procedures	WSD offices	40
Leaflet	OHS Policy and management system	WSD staff and noticeboards	1500
Poster	‘Establishing a new OHS culture’	WSD sites and staff notice boards	150



*Endorsement of WSD OHS policy* – Following receipt of comments from WSD (expected in December 2005) the draft OHS Policy will be amended and presented to the WSD Director for signature and endorsement.

*Endorsement of WSD OHS management system manual* – Following receipt of comments from WSD (expected in December 2005) the draft OHS management system manual will be amended and presented to the WSD Director for signature and endorsement.

*Endorsement of WSD corporate OHS procedures* – Following receipt of comments from WSD (expected in December 2005) the draft corporate OHS procedures will be amended and presented to the WSD Director for signature and endorsement.

*Management Awareness Training Sessions 1* – Following endorsement of the OHS policy, management system and corporate procedures a one day management awareness training session will be held to highlight the key components and responsibilities.

*Appoint interim OHS staff* – As permanent staff will not be in place until the reform is further progressed, WSD has proposed developing an interim position as an ‘OHS Officer’. This position would be filled on a term basis. It is anticipated that the necessary approvals and appointment will occur by March 2006.

*Confirm reporting lines* – The OHS staff will ultimately be within the Human Resources function and formal reporting lines will need to be confirmed, especially regarding direct report to the WSD Director as required by certain of the corporate OHS procedures (i.e. emergency response and incident management).

*Determine administrative procedures* – The OHS management system manual and corporate OHS procedures outline various administrative processes and procedures for OHS including monitoring and reporting. However further work is required to develop a consistent administrative system to ensure that processes and procedures are consistently applied. This work can only proceed when staff is appointed to positions and procedures are trialled and implemented.

*Conduct training for WSD OHS staff* – Once the OHS policy, management system and corporate OHS procedures have been endorsed it will be essential to conduct training with the WSD OHS staff that will have a key role in leading and championing the system. This training will cover the OHS Policy and management system procedures, as well as developing administrative procedures and reporting lines. The training will be provided by a technical resource primarily ‘on-the-job’ and by conducting workshops.

*Launch OHS policy* – The OHS is to be formally launched throughout WSD during March. Posters and leaflets will be distributed through WSD and copies of the Policy will be placed on all site staff noticeboards.

*Management Awareness Training Sessions 2* – As part of the OHS Policy Launch a second management awareness training session will be delivered. Session 2 will provide more detail regarding the implementation of the OHS programme and will focus on appropriate management behaviours to effect cultural change.

*WSD Staff Awareness Training* – to coincide with the OHS policy launch awareness training sessions will be delivered to WSD staff. These sessions will focus on general

awareness of the policy and systems, as well as key behaviours to effect cultural change.

*Trial of key corporate OHS procedures (refer to Volume 6 – Appendix 1)* – The endorsed corporate OHS procedures should be trialled and evaluated prior to implementation throughout WSD. The trial will enable appropriate modifications to the procedure where appropriate, as well as generate real ownership of the procedures by WSD. Key corporate OHS procedures included in the trial have been chosen based on ‘significant risk’ criteria or importance in establishing a sound foundation for a proactive OHS culture. In order to engender ownership and ensure exposure throughout WSD following the launch of the OHS policy it is proposed that different procedures are trialled in different divisions. The trials will occur over a five month period to thoroughly evaluate the practicality of each procedure and to enable modification as appropriate. The actual details for each trial will be determined once the interim OHS staff are in place but the actions in Table 6.4 will be necessary for trialling the key OHS procedures.

**Table 6.4 Necessary actions for trialling the OHS procedures**

Key procedure number	Key procedure title	Required actions
CP-WSD-OHS-001	Hazard identification and risk assessment	<p>Print copies of HIDRA Form (FO-WSD-OHS-001) – initial print run of 200</p> <p>Develop HIDRA training package for Supervisors</p> <p>Conduct Supervisor’s HIDRA training workshops</p> <p>Complete HIDRA for operations and activities in trial area</p> <p>Review and assess HIDRA’s for consistency and applicability to operations</p> <p>Update, modify procedures as appropriate</p> <p>Develop plans for implementation throughout WSD</p>
<p><i>Notes: HIDRA trial to take place in one division and to cover both water and sewerage sections. Expenditure will be required to implement likely control strategies identified as part of HIDRA and therefore successful implementation during and beyond the trial will require allocated budgets. Priority should also be given to conducting HIDRA on activities involving chemicals and working at height (reference should be made to corporate procedures relevant to these activities).</i></p>		
CP-WSD-OHS-004	Safe Working in a Confined Space	<p>Print copies of Confined Space Permit to Work (FO-WSD-OHS-009) – carbon forms, initial print run of 200</p> <p>Identify external confined space training organisation</p> <p>Identify company to supply required equipment for confined space entry e.g. gas monitors and rescue equipment (harnesses, tripods etc)</p> <p>Develop procedures for maintenance of confined space equipment</p> <p>Conduct training programmes based on training requirements identified in procedure – awareness and entry requirements (note confined spaced entry staff require a five day training course)</p> <p>Identify all confined spaces and sign appropriately</p> <p>Review trial implementation and modify process accordingly</p> <p>Update, modify procedures as appropriate</p>

Key procedure number	Key procedure title	Required actions
Develop plans for implementation throughout WSD		
<i>Notes: It is proposed to trial the Safe Working in a Confined Space procedure in the Sewerage Section of the Western Division. The implementation of this procedure will require expenditure on various equipment items and provision of external training. Purchasing agreements should be sought with external providers to provide training, equipment and maintenance. In particular maintenance and test requirements for safety critical items such as gas detectors and rescue equipment should be include in any purchasing agreement.</i>		
CP-WSD-OHS-008	Safe Systems of Work	<p>Print copies of JSA Form (FO-WSD-OHS-013) – initial print run of 200</p> <p>Develop Safe Systems of Work training package for Supervisors</p> <p>Conduct Supervisor’s Safe Systems of Work training workshops</p> <p>Complete JSA for operations and activities in trial area</p> <p>Review and assess JSA’s for consistency and applicability to operations</p> <p>Update, modify procedures as appropriate</p> <p>Develop plans for implementation throughout WSD</p>
<i>Notes: Safe systems of work trial to take place in one division and to cover both water and sewerage sections. Expenditure may be required to implement likely control strategies identified as part of JSA and therefore successful implementation during and beyond the trial will require allocated budgets.</i>		
CP-WSD-OHS-002	Incident management, investigation and reporting	<p>Print copies of incident forms (FO-WSD-OHS-003 and 4 and 5) – initial print run of 50</p> <p>Develop incident management training package for managers and supervisors (reporting and investigation)</p> <p>Conduct managers and supervisors training workshops</p> <p>Conduct WSD staff awareness sessions</p> <p>Establish data recording proforma and spreadsheet (database?)</p> <p>Review and assess implementation of procedure and applicability to WSD</p> <p>Update, modify procedures as appropriate</p> <p>Develop plans for implementation throughout WSD</p>
<i>Notes: Incident management, investigation and reporting procedure trial to take place Central Eastern Division.</i>		

*Apply key corporate OHS procedures throughout WSD* – Following the trial of key OHS procedures as described above, the procedures will be amended as appropriate and implemented throughout WSD. Similar activities to those undertaken in the trial will apply to implementation throughout WSD. Individual work plans will be developed following each trial. Some issues identified during trial of key procedures may apply to all other corporate OHS procedures, and therefore global changes/modifications should be made as appropriate.

**Table 6.5 Year 2 – 2007**

Date	Activity	Responsibility
January	Appoint permanent WSD OHS staff	WSD/PMU reforms
	Conduct training for WSD OHS staff	WSD
	Progressive implementation of corporate OHS procedures	WSD

**Activity statements**

*Appointment of permanent WSD OHS staff* – The reform process should be finalised to the point where the permanent staff recommended under TA 4270 can be deployed. The OHS staff will comprise a Manager and two OHS divisional coordinators. Position descriptions were included as part of the interim report.

*Conduct training for WSD OHS staff* – It will be essential to conduct training for the WSD OHS staff that will have a key role in leading and championing the OHS system. This training will cover the OHS policy and management system procedures.

*Progressive implementation of all corporate OHS procedures throughout WSD* – There will need to be a progressive implementation of procedures throughout 2007 and beyond (for details on procedures refer to Volume 6 – Appendix 1). Table 6.6 provides details of the required actions for each corporate OHS procedure.

**Table 6.6 Required actions for each corporate OHS procedure**

Key procedure number	Key procedure title	Required actions
CP-WSD-OHS-003	Personal protective equipment (PPE)	<p>Conduct basic PPE needs assessment for a site/location/activity (HIDRA to be completed when conducting assessment)</p> <p>Ensure PPE is available on site (purchasing, storage, maintenance and testing requirements to be considered)</p> <p>Sign areas indicating PPE requirements (appropriate signs to be purchased)</p> <p>Conduct awareness and specialist training for PPE use on a site/location/activity</p> <p>Develop and distribute leaflet on PPE</p> <p>Establish records for PPE issue and training, to include testing, replacement and re-training frequencies</p> <p><i>Note: Purchasing agreements to be established that ensure appropriate quality and standard (AS/NZS) for PPE – include in agreements maintenance and training contracts as appropriate</i></p>

Key procedure number	Key procedure title	Required actions
CP-WSD-OHS-005	Isolation and lockout	<p>Print copies of Permit to Work (FO-WSD-OHS-010) – carbon forms, initial print run of 200</p> <p>Purchase lock out and isolation equipment for an individual site (locks, out of service tags, personal danger tags, lockout devices and boards)</p> <p>Develop training package for lockout tagout procedures</p> <p>Develop and distribute leaflet on procedure</p> <p>Identify all equipment, processes and systems to be included in isolation and lockout procedures</p> <p>Conduct training programmes for responsible persons, supervisors and maintenance/operations personnel</p>
CP-WSD-OHS-006	Hot work	<p>Print copies of Hot Work permit (FO-WSD-OHS-012) – carbon forms, initial print run of 200</p> <p>Develop training package for Hot Work procedures</p> <p>Identify all hot work that is to be exempt from procedure (record exempt activities)</p> <p>Develop and distribute leaflet on procedure</p> <p>Conduct training programmes for responsible persons, supervisors, stand-by persons and persons involved in hot work</p>
CP-WSD-OHS-007	Training and induction	<p>Conduct Training Needs Analysis to include OHS requirements</p> <p>Develop employee induction training to include OHS requirements</p> <p>Provide input for the development of individual training needs and plans for OHS</p> <p>Develop and distribute leaflet on procedure</p>
CP-WSD-OHS-009	Emergency response planning (ERP)	<p>Develop and conduct training workshops for the development of ERP</p> <p>Prepare ERP for all sites/facilities</p> <p>Ensure appropriate alarm systems and emergency signage are established, maintained and operable</p> <p>Establish emergency shower and eye wash facilities for sites where corrosive chemicals are handled</p> <p>Establish appropriate fire fighting equipment and facilities at each site</p> <p>Develop and conduct training on emergency response arrangements at all facilities</p> <p>Develop and distribute leaflet on procedure</p>
CP-WSD-OHS-010	Health monitoring and assessment	<p>Identify appropriate medical health provider (possibly Ministry of Health)</p> <p>Conduct health assessment and monitoring assessment</p> <p>Establish health assessment programmes including vaccinations and medicals for key work activities (including confined space, sewerage workers, laboratory workers, chemical handlers etc)</p> <p>Develop and distribute leaflet on procedure</p>

Key procedure number	Key procedure title	Required actions
CP-WSD-OHS-011	OHS consultation and communication	<p>Print hazard and issues form (FO-WSD-OHS-014), pre-job start meeting forms (FO-WSD-OHS-016) and tool box meeting records (FO-WSD-OHS-017 – initial print runs 2,000 of each</p> <p>Produce OHS Communication Plan for 2007</p> <p>Develop tool box meeting topics from key messages identified in communications plan</p> <p>Develop and deliver training to supervisors and employees</p> <p>Develop and distribute leaflet on procedure</p>
CP-WSD-OHS-012	OHS representatives and committees	<p>Ensure arrangements for OHS representatives and Committees are in accordance with procedure</p> <p>Ensure all OHS representatives attend accredited training</p> <p>Develop and distribute leaflet on procedure</p>
CP-WSD-OHS-013	OHS performance monitoring and review	<p>Establish corporate WSD OHS plan for 2007</p> <p>Identify and establish OHS objectives and targets for 2007</p> <p>Establish OHS audit schedule</p> <p>Collect and analyse OHS performance data</p> <p>Develop and distribute monthly OHS performance report and trend analysis</p> <p>Develop and distribute leaflet on procedure</p>
CP-WSD-OHS-014	Safe working at height	<p>Ensure HIDRA conducted on work activities and sites take account of minimum standards for working at height – hierarchy of controls</p> <p>Safe systems of work to incorporate minimum standards for fall protection and fall prevention</p> <p>Develop and conduct training package for working at height</p> <p>Identify options for providing work platforms, guard rail systems, scaffolding, harnesses etc</p> <p>Develop arrangements with hire companies and suppliers where impractical to purchase own equipment</p> <p>Establish procedures for testing and inspecting equipment (including recording of details)</p> <p>Develop and distribute leaflet on procedure</p>
CP-WSD-OHS-015	Chemical management	<p>Complete HIDRA and safe systems of work for all chemical storage and handling activities</p> <p>Obtain MSDS for all chemicals used on site and ensure required precautions are implemented</p> <p>Develop chemical register for each site</p> <p>Establish chemical emergency arrangements including safety showers, eye wash facilities etc</p> <p>Ensure all PPE identified as part of HIDRA is available and worn at all times when working with chemicals</p> <p>Assess current storage arrangements and ensure appropriate segregation and storage to prevent spillage, rupture of container or accidental loss of product</p> <p>Assess handling arrangements and identify manual handling risk – develop appropriate control strategies</p> <p>Develop and distribute leaflet on procedure</p>

Key procedure number	Key procedure title	Required actions
CP-WSD-OHS-016	First Aid	<p>Identify First Aid Coordinator and first aiders</p> <p>Develop procedures for prevention of transmission of infectious diseases</p> <p>Purchase appropriate first aid supplies for each suite/location (purchase agreements should be established for replacement, maintenance and training)</p> <p>Identify first aid training supplier and deliver training to first aiders</p> <p>Develop and distribute leaflet on procedure</p>
CP-WSD-OHS-017	Traffic management and vehicle safety	<p>Establish local procedures to ensure only licensed and trained personnel are employed as drivers</p> <p>Establish local procedure for daily vehicle checks and inspections</p> <p>Establish local site rules for traffic movements – clearly sign restrictions</p> <p>Establish/purchase sufficient quantities of traffic management signs and devices to comply with minimum standards of procedure</p> <p>Develop and conduct training package for people working on or adjacent to public highways and public areas</p> <p>Develop and distribute leaflet on procedure</p>
General	Signage and information	<p>There is a need for signage throughout WSD sites and facilities. This signage includes requirements for PPE, restricted areas, emergency routes etc</p> <p>Information should be used to promote OHS throughout WSD including posters, leaflets and brochures</p> <p>General awareness training will be an on-going requirement</p>
All	Ministry of Labour (H&S Inspector) consultation	<p>Throughout 2007, the OHS staff should consult with the H&amp;S inspectors at the Ministry of Labour and obtain comment/feedback on the WSD OHS policy and corporate OHS procedures</p>

**Table 6.7 Year 3 – 2008**

Date	Activity	Responsibility
January	Review OHS policy and management system	WSD

### Activity statements

*Review of OHS policy and management system* –The OHS policy and management system will be current for two years. By 2008, the policy will require a comprehensive review. This review should be based on the following parameters:

- feedback received from the organisation based on implementation of OHS policy and management system
- progress towards meeting the objectives and targets of the OHS policy

- review of the applicability of the corporate OHS procedures to the WSD organisation
- progress of implementation
- any relevant changes to legislation and any feed back from the H&S Inspector at the Ministry of Labour.

#### **6.4 ADDITIONAL TECHNICAL RESOURCE REQUIREMENTS**

There is a need to identify additional requirements to ensure the thorough implementation of the program. A major issue with the timing of the TA has been the lack of a WSD counterpart or a dedicated resource that will assume responsibility for the ongoing management of the OHS program. Therefore the timing of the TA has not allowed any opportunity for a review of any implementation or provided opportunities for a skills transfer to WSD staff.

In order for these two critical components of implementation to occur, there is a requirement for the following additional consultant inputs:

- there is an additional requirement of one week full time in January to facilitate the final endorsement of the OHS policy and management system procedures.
- additional requirement of approximately 40 days full time during March/April 2006 to provide on-the-job training for the interim OHS staff and to provide technical assistance for the implementation of the key OHS corporate procedures.

#### **6.5 OHS, VOLUME 6 – APPENDIX 1 – REFERENCE DOCUMENTS**

In meeting the requirements of the TOR several reports outlining the existing OHS performance at WSD have been produced. These reports have been included with the OHS management system documentation as a comprehensive reference guide to provide the rationale and context for the OHS Policy and OHS management system corporate procedures. The following documents are included in the OHS, Volume 6 – Appendix 1:

- PO-WSD-OHS-001 WSD OHS policy
- MA-WSD-OHS-001 WSD OHS Management System Manual.

##### *Corporate procedures*

- CP-WSD-OHS-001 Hazard identification and risk assessment
- CP-WSD-OHS-002 Injury management, investigation and reporting
- CP-WSD-OHS-003 Personal protective equipment
- CP-WSD-OHS-004 Safe working in a confined space
- CP-WSD-OHS-005 Isolation and lockout
- CP-WSD-OHS-006 Hot work
- CP-WSD-OHS-007 Training and induction



- CP-WSD-OHS-008 Safe systems of work
- CP-WSD-OHS-009 Emergency planning
- CP-WSD-OHS-010 Health monitoring and surveillance
- CP-WSD-OHS-011 OHS consultation and communication
- CP-WSD-OHS-012 OHS representatives and committees
- CP-WSD-OHS-013 OHS performance monitoring and review
- CP-WSD-OHS-014 Safe Working at Height
- CP-WSD-OHS-015 Chemical management
- CP-WSD-OHS-016 First Aid
- CP-WSD-OHS-017 Traffic management and vehicle safety.

#### *Forms*

- FO-WSD-OHS-001 Hazard identification and risk assessment form
- FO-WSD-OHS-002 Workplace injury and disease notification form
- FO-WSD-OHS-003 Incident report form
- FO-WSD-OHS-004 Causal factor and corrective action checklist
- FO-WSD-OHS-005 Incident investigation report
- FO-WSD-OHS-006 Confined space entry design checklist
- FO-WSD-OHS-007 Confined space register
- FO-WSD-OHS-008 Confined space hazard identification checklist
- FO-WSD-OHS-009 Confined space entry permit
- FO-WSD-OHS-010 Permit to work certificate
- FO-WSD-OHS-011 Tag removal form
- FO-WSD-OHS-012 Hot work permit
- FO-WSD-OHS-013 Job safety analysis
- FO-WSD-OHS-014 Hazard and H&S issue form
- FO-WSD-OHS-015 Hazard and H&S issue register
- FO-WSD-OHS-016 Pre-job safety start meeting record
- FO-WSD-OHS-017 Toolbox talk meeting record
- FO-WSD-OHS-018 OHS audit checklist (template)
- FO-WSD-OHS-019 OHS audit report
- FO-WSD-OHS-020 OHS corrective action request (CAR)
- FO-WSD-OHS-021 OHS audit register.

#### *Supporting information*

- Review of Legislative Compliance at WSD

- OHS Management System Assessment at WSD
- Cost Estimate for OHS – cost of compliance
- Functional requirements for IT Solution – OHS.

*OHS position statements*

- Tamavua Water Treatment Plant – OHS assessment
- Waila Water Treatment Plant – OHS assessment
- Naboro Water Treatment Plant – OHS assessment
- Korovou Water Treatment Plant – OHS assessment
- Kinoya Waste Water Treatment Plant – OHS assessment
- Water and Sewerage Network, Pump Stations and Pump Workshops– OHS assessment
- National Laboratory Kinoya – OHS assessment.

# 7 Tariff review

## 7.1 INTRODUCTION

This section comprises the tariff review component of the Final Report of TA 4270: Capacity Building in the Water and Sewerage Sector in Fiji that was first prepared and submitted to the ADB and the Government of Fiji in December 2005. At that time, finalisation of the tariff review (the subject of this volume) was pending completion of work by the PMU for reform to corporatise the WSD and the putting into effect the capacity building recommendations of TA 4270.

In the third quarter of 2007, the work of the PMU and the new institutional capacity recommended by the TA have not been fully implemented, though it is understood that corporatisation of the WSD remains a high government priority. At the end of 2006, the PMU submitted its outputs to the government and was then disbanded. In these circumstances, and in hopes of furthering the corporatisation process, it has been judged in the best interests of all parties that the tariff review component of the TA be updated and finalised based on the final outputs of the PMU to reflect the considerable work that was accomplished during 2006, in particular the further analysis of the capital and operating costs of a corporatised WSD. For the purposes of the tariff review, the final outputs of the PMU consist of the December 2006 version of the financial model that was originally prepared under TA 4270 and extensively updated by the PMU during 2006.

The ADB loan-financed Suva-Nausori Upgrade Project, which commenced in 2005, has experienced delays in implementation and disbursements have fallen behind schedule. It is understood that the delays have been caused by government financing issues and also by capacity constraints within the WSD. The Upgrade Project is closely associated with the reform process and has particular importance to the tariff review as institutional reform, physical system improvements (through both higher investment and improvements in capacity and procedures) and tariff adjustments need to proceed in tandem. The timing and outcomes of the reform process, investment program and tariff adjustment remain, as of the third quarter of 2007, highly uncertain.

In what follows, the December 2005 draft of Volume 7 of the Final Report of the TA is updated to reflect the estimated costs of a corporatised WSD as prepared by the PMU at the end of 2006. The estimates are extracted from the detailed financial spreadsheet model originally developed under the TA and subsequently taken over and updated by the PMU in the course of its work through 2006.

All dollar values (\$) in this chapter refer to Fiji Dollars unless otherwise noted.

## 7.2 OBJECTIVES

The ultimate purpose of the ADB-assisted investment and institutional reform of the water supply and sewerage sector in Fiji is to reduce poverty by addressing one of poverty's prime contributing factors: inadequate provision of a safe and reliable water supply and effective sanitation services. TA 4270, to support institutional development and capacity building in the sector and carried out in concert with the PMU for institutional reform, is a key component of this effort. The overall objectives of the tariff review component of the TA are to support the institutional reform process by:

- estimating the full costs of providing water supply and sewerage services in Fiji, taking into account the operating and capital requirements of an efficient and quality service
- allocating costs to users and other stakeholders including poor households, non-poor households, the private sector, and the Government. This will result in a draft proposal for increasing the tariff to support the ongoing reform process, while safeguarding the financial interests of the poor.

In detail, the objectives of the tariff review component are to:

- develop cost recovery objectives and targets
- update financial projections for the WSD and assess ability of tariffs to meet cost recovery objectives
- identify average costs in major and minor systems
- determine financial tariffs necessary to meet O&M costs, debt service, and full cost recovery
- assess affordability by the poor and develop tariff structures that take this into account
- identify subsidies as necessary to sustain services to the poor
- consider separate tariffs for different sizes of systems, level of service and affordability
- help develop a public awareness campaign to support introduction of a new tariff.

It is generally well recognised, at least by the Government and the donor community if not yet by all users, that a reliable and safe water supply and effective sanitation services are costly for any country to provide. This is especially so for Fiji, where the population is widely dispersed and economic integration is far less than in more developed countries, due to formidable geographic barriers. If, from a cursory comparison of water tariffs around the world, water appears to be relatively cheap in Fiji, it is manifestly not so: many costs are hidden, uncontrolled, non-monetary, and are far higher than they need to be because of historic inefficiencies that are growing gradually worse as infrastructure degrades and asset performance declines. Prominent examples of costs which are generally hidden from the community at large include poor performance and shortened life of assets because of under expenditure in maintenance, operating costs that are higher than need be, losses higher than need be, non-transparent and uncontrolled subsidies (including, for example, a prevalence of illegal connections to the water supply) and, not least, consumer costs related to

supply interruptions. This last item may be the most difficult to appreciate, especially in a society that has grown accustomed to years of poor service. When a water supply interruption occurs to a single household or to a community, alternatives usually involving substantial physical labour and/or much higher cash outlays have to be found to supply basic needs and psychological/emotional adjustments have to be made to varying degrees of deprivation. Taken in aggregate, these represent heavy economic costs to any community that suffers interruptions frequently or for lengthy periods, and contribute significantly to the extent and depth of poverty in the country.

The tariff review process is essentially one of drawing together all ‘expensed’ costs and hidden costs, making them all explicit and allocating them deliberately to stakeholders (users and Government). When all costs are explicit and properly allocated and the management reform processes are completed, the total costs of the sector should be lower than before, reflecting higher efficiency, improved service to all users (lowering user costs, including non-monetary costs) and better support from the sector to the economic development of the country.

No ambitious undertaking is complete without a caveat and the tariff review is no exception. Fundamentally, the tariff review at present is constrained because it is being conducted for an entity which doesn’t yet exist: the corporatisation process progressed by the PMU in 2006 hasn’t been completed in the third quarter of 2007, while the capacity building recommended under TA 4270 awaits recruitment of needed new personnel (though the procedures, policies, manpower requirements and costs of the new capacity are now identified). Before disbanding, the PMU recommended the creation of a commercial statutory authority for water supply and sewerage, endorsed by senior WSD management and the multi-departmental Reforms Coordinating Committee, but the practical steps for this are still underway. Notwithstanding the progress made in 2006, a heavy workload of activities remains to achieve implementation, including:

- a comprehensive review of customer meters to identify the presently unknown but large number of illegal connections and faulty meters
- determination of raw water acquisition and sludge disposal costs
- a review of overall manpower, training, and salary requirements
- the implementation of new accrual-based accounts and financial management systems, with appropriate IT support
- adoption of a new asset management system
- development and adoption of a ten year capital investment budget.

The results of each of which will have a large impact on the tariff proposal that will be adopted at the end of these processes. What follows, then, is not presented as a tariff proposal as such, but is intended rather as a framework for developing a formal tariff proposal in step with the remaining reform activities. The framework identifies the quantities (such as those indicated above) that are on the ‘critical path’ for tariff determination with initial estimates of their values as of December 2006 (based on the work of the PMU during that year).

### 7.3 THE EFFECTS OF INSTITUTIONAL REFORM

The institutional reform process represents a break from the past practice of service provision – in particular, the priority is no longer simply to meet a supply target within the constraints of an externally-approved budget, but rather the provider must now to ensure that adequate resources are available to supply the services demanded by customers. The resources available to the provider will be a combination of user fees, external grants and loans and explicit Government subsidies, all of which the provider will have to justify prior to expenditure. The reform process introduces incentives to improve efficiency and lower costs, a new emphasis on customers and demand management and a risk that poor performance will result in a shortfall of resources and a threat to the viability of the organisation, for which the managers will be held materially accountable.

It is in this context that the tariff review is carried out. In particular, it is assumed that costs will be determined in a commercial environment with key changes from present practices including the following:

- revenues collected from customers are retained by the organisation for use in operations and investment, apart from taxes or dividends that may be payable
- the organisation has authority to contract for external capital resources for investment, including loans and grants from any source including the private sector
- the organisation enjoys autonomy from the Government budget and Government budget processes except where explicit subsidies are concerned
- the organisation is autonomously responsible for personnel recruitment, management and training, and establishes a wage and salary structure appropriate to its long term needs
- the organisation adopts accrual-based financial management and accounting systems based on accepted international commercial practices.

As mentioned, such changes imply a new focus by the organisation on its revenue base and on its relationship with customers. The organisation will accordingly be vitally concerned with the following, including relatively intense set-up efforts during the initial few years as the reform process proceeds:

- discovering illegal connections in all supply areas and converting them to legitimate connections
- correcting faulty metering
- eliminating ‘rebates’ for water losses on the customers’ side of the meter
- improving revenue collection rates against invoices nationally from the current 70% to above 90%
- improving customer service and customer relations and increasing the effectiveness of response to customer complaints
- raising public awareness of water supply, conservation, and sanitation issues
- maintaining an accurate, flexible, and accessible customer database

- implementing a program to handle high-volume and/or high-strength liquid waste from commercial and industrial customers in order to recover costs associated with such wastes and minimise risks to the collection and treatment systems
- securing legally-enforceable access to adequate raw water supplies
- meeting applicable water quality and effluent standards
- detecting and repairing leakages in the water supply and sewage collection systems and eliminating avoidable losses
- making all subsidies paid by the government or external agencies transparent, explicit and controllable.

The tariff review process assumes that these steps are undertaken by the corporatised service provider to secure its revenue base. In addition, it is assumed that the organisation meets the cost of effectively implementing capacity to fulfil the organisation's requirements under legislation to safeguard the environment from overflows and improper disposal of effluent and sludge and to protect the health and safety of all personnel and the public at large.

#### **7.4 ACTIVITIES TO DATE**

To meet the above objectives, the following steps have been carried out under the tariff review component of the TA:

- collection of cost data by service sector, region, and a sample of treatment plants through consultation with plant managers and administration officials
- review of assets and estimation of asset-related costs (depreciation, repairs and maintenance)
- compilation of costs associated with capacity-building and institutional reform
- preparation of a detailed financial model of the water supply and sewerage sector in Fiji to be used as a tool to specify financial objectives, analyse tariff implications and justify a tariff recommendation
- review, in 2007, of available outputs of the PMU's work in 2006 in regard to preparing the WSD for corporatisation; in particular, the new estimated operational costs and investment plan with which the PMU updated the financial model that was originally developed under TA 4270
- conduct of numerous workshops with senior WSD managers and engineers, and consultations with representatives of the Ministry of Public Enterprise and the Ministry of Finance and Economic Development on unaccounted for water and WSD future growth in services and costs, reform priorities affecting costs and tariff implications
- a final workshop for WSD management and government officials on the PMU's updated costs and investment plan, with tariff implications, delivered by the TA Consultant in June 2007
- updating and finalising of the tariff component (this volume) of the TA 4270 Final Report.

The results are discussed in detail below.

## **7.5 THE TARIFF REVIEW MODEL**

A detailed Excel™-based financial spreadsheet model of the Water and Sewerage Department has been prepared as a flexible tool to estimate, inter alia, present and future water and sewerage volumes, numbers of customers in different categories, physical input costs, personnel and training costs, capital costs and financing charges, and costs associated with capacity building in the reformed organisation from 2004 through 2015. The model has been developed in order to form a comprehensive picture of the costs that will have to be met by the sector and to calculate revenue requirements under different tariff and subsidy scenarios and to test the sensitivity of results to changes in key assumptions. No picture of the future over ten years is perfect and uncertainty in some of the basic parameters is acute in view of the reform process currently underway in the WSD, as discussed further below. The model in its present stage of development represents a consistent set of assumptions and estimates that should be further refined as the reform process continues. The model was developed in close coordination with the financial management and asset management work of the PMU Reform Project.

Key portions of the model are reproduced in the Appendix to the Tariff Review Volume. Briefly, the model contains the projected financial performance of the WSD as measured by standard financial statements including a profit and loss statement, a balance sheet, and a statement of cash flows, employing accrual accounting methods similar to those developed for the WSD under the financial management component of the PMU Reform Project. At the core of the analysis are detailed calculations of customer and demand growth and associated volume requirements; projections of personnel and training costs; expected repair and maintenance requirements; costs of physical inputs such as electricity; chemicals; and fuel; other recurrent costs; and future capital requirements. Start-up and annual costs of new institutional capacity supported by this TA (environmental management, trade waste, customer relations, public relations, community awareness and occupational health and safety programs) as well as new areas supported by the PMU Reform Project (e.g., information technology, asset management, financial management and human resource development) are included in the cost estimates.

## **7.6 GROWTH ESTIMATES, LOSS REDUCTIONS, AND BASIC COSTS**

### **7.6.1 Water supply**

#### **Demand projections**

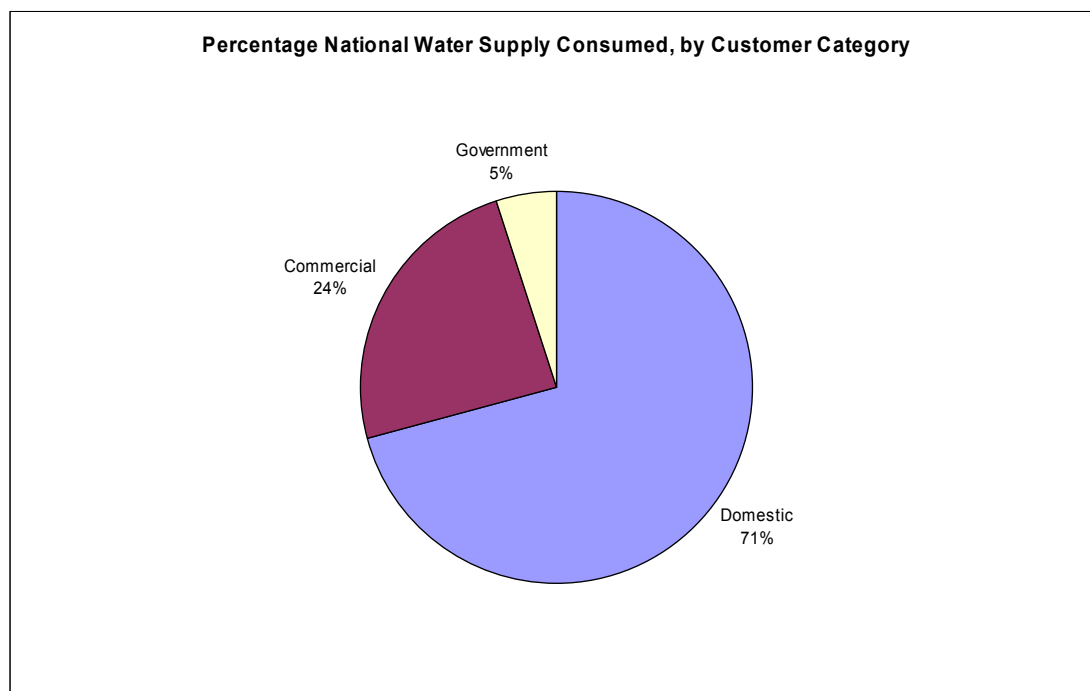
Using 2005 as the base year, the WSD presently has about 127,000 legitimate water supply connections plus a large number – roughly estimated at around 40,000<sup>4</sup> – of illegal connections. Nationally, about 92% of all connections are domestic, 7% are commercial/industrial, and 1% are government. An estimated total of

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<sup>4</sup> Anecdotal evidence indicates that the actual number of illegal connections could be far higher; an extensive metering survey to discover illegal connections and to correct faulty meters is urgently needed.



110,000 million litres (ML) of potable water will be produced by the WSD in 2007, of which about 53,000 ML will be consumed by customers legitimately connected to the water supply and a further 35,000 ML will be consumed through illegal connections. Of the water volume taken through legitimate connections about 71% is consumed by domestic customers, 24% by commercial/industrial customers and the balance of 5% by government. About 54% of potable water will be produced in the Central/Eastern Division, 39% in the Western Division and 7% in the Northern Division. These percentage distributions are depicted graphically in Figure 7.1.



**Figure 7.1**  
**Percentage national water supply consumed by customer category**

It is assumed that a campaign has commenced as part of the reform process to discover illegal connections and convert them to legitimate connections and that meter testing is resulting in replacement of inaccurate meters, to continue through about 2012, throughout the WSD's service territories. If present estimates of illegal connections and illegal water consumption are reasonably accurate, the effect of such a campaign will have a dramatic effect of reduction in the volume of UFW nationally.

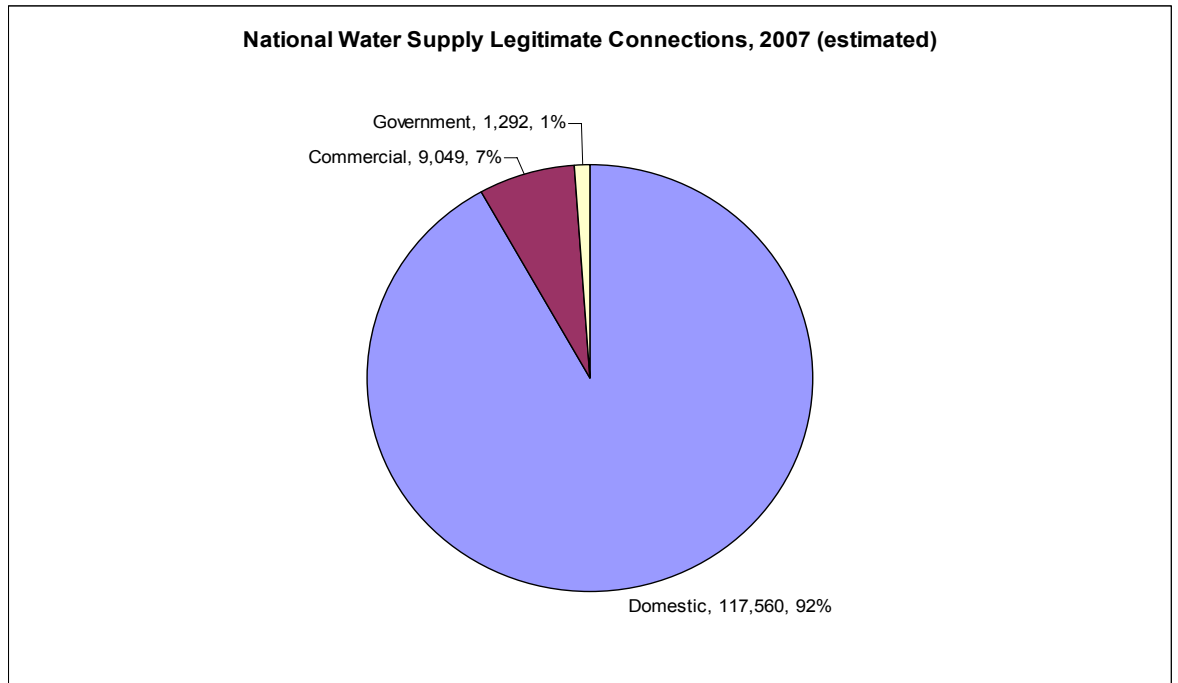
As shown in Figure 7.5, the total volume of the potable water production requirement rises from about 107,000 ML in 2005 to about 124,000 ML by the end of the period (2015), at an average annual growth rate of 1.5%.

Based on the latest Census<sup>5</sup>, a comparison of the number of legitimate domestic water supply connections with the number of potentially connectable households in each division shows that the Western Division leads with 84.1%, followed by the Central/Eastern Division at 73.9%, and 58.8% in the Northern Division. The weighted

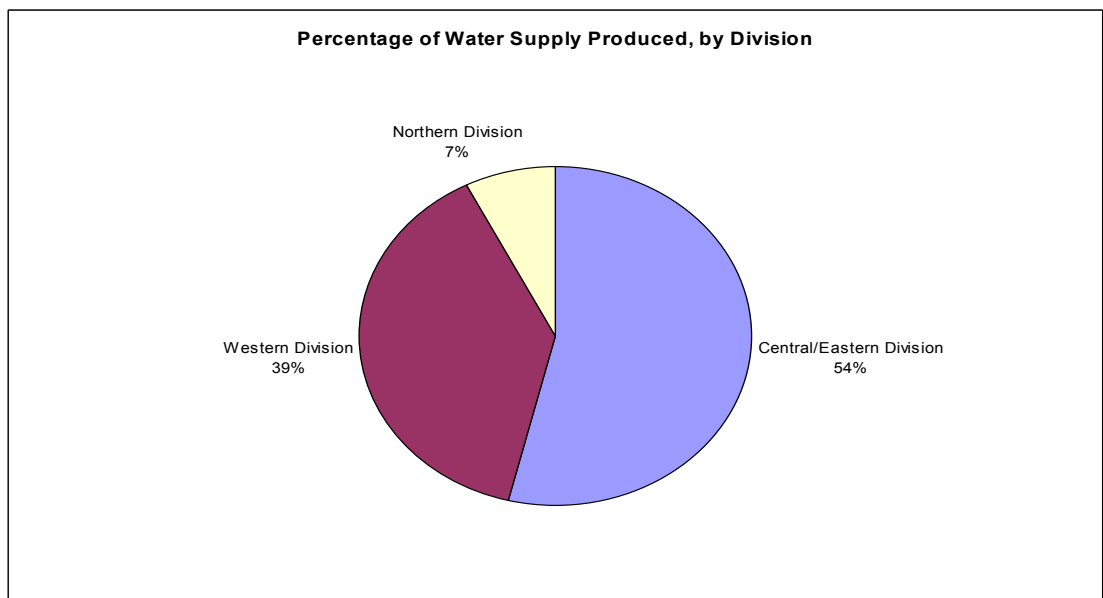
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<sup>5</sup> Last done in 1996, with some updated analysis since then. A new census has begun in September 2007 but its results will not be available until 2008.

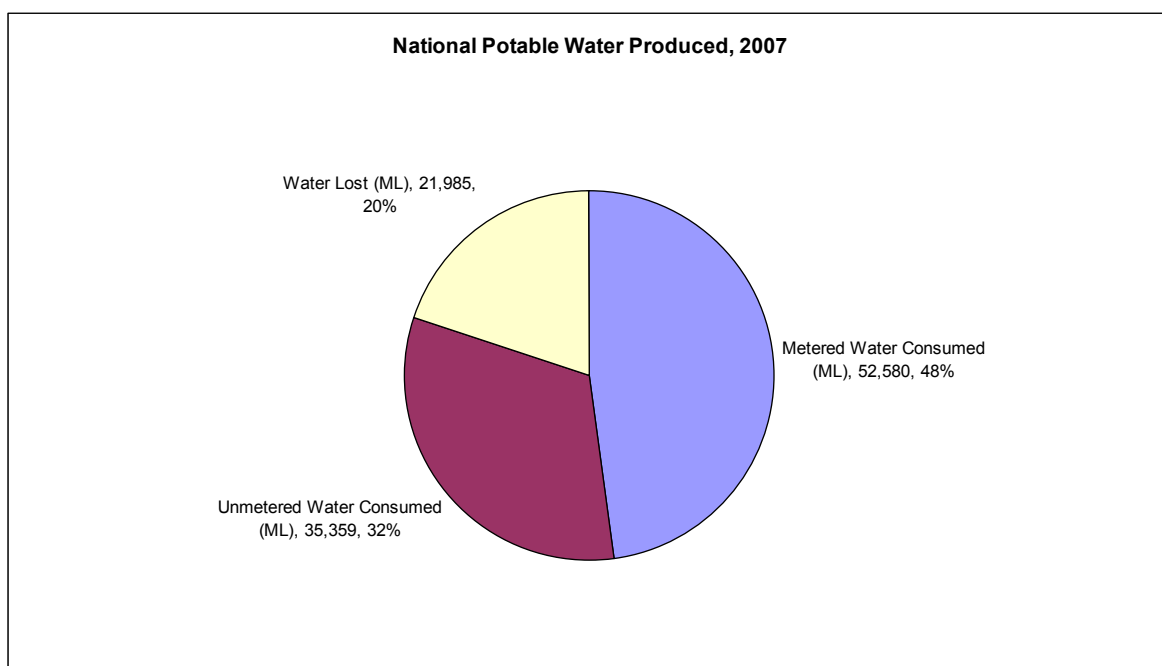
national average is thus 75.3%. However, due to the presumed but likely prevalence of illegal connections, actual connections are much closer to 100% of potentially connectable households. Thus when the present estimates of illegal connections by division are added in, the percentage of connections-to-connectable-households rises to 97% in the Western Division, 100% in Central/Eastern, and 79% in the North, producing an overall national weighted average of 97%.



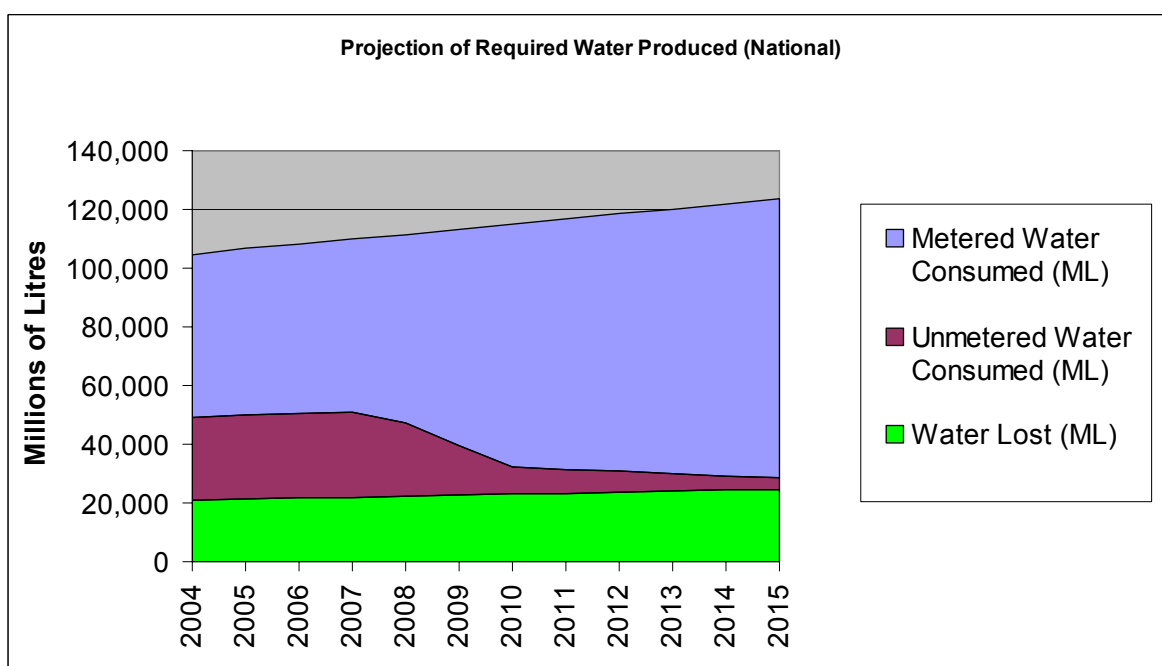
**Figure 7.2**  
National water supply legitimate connections, 2007 (est)



**Figure 7.3**  
Percentage of water supply produced by division, 2007 (est)

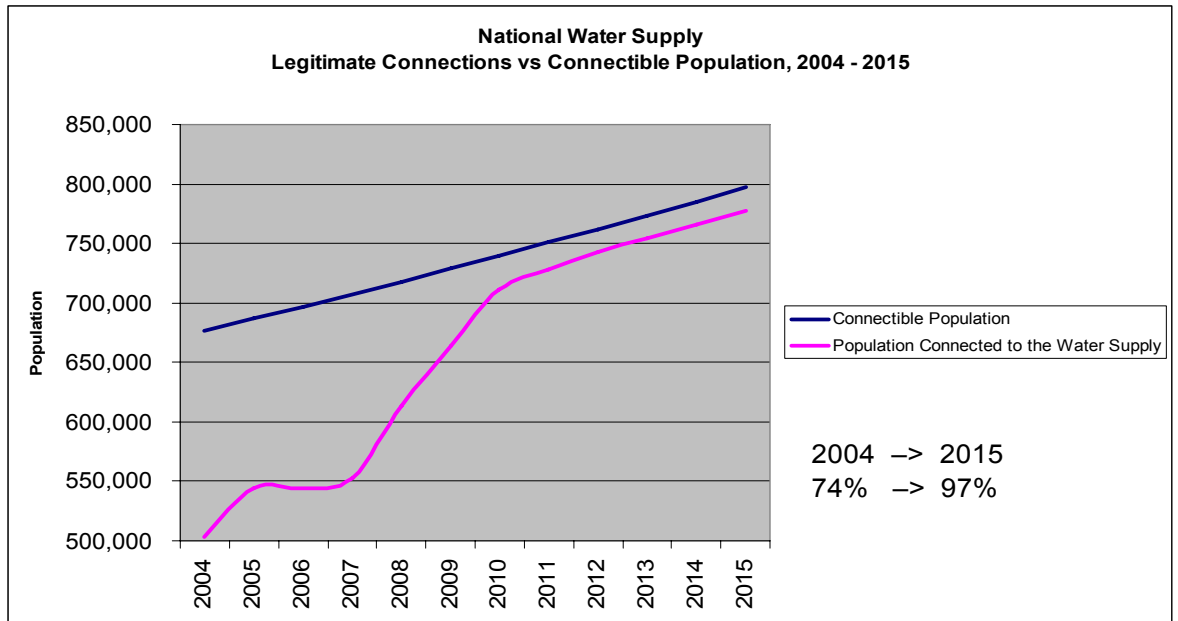


**Figure 7.4**  
National potable water produced 2007 (est)

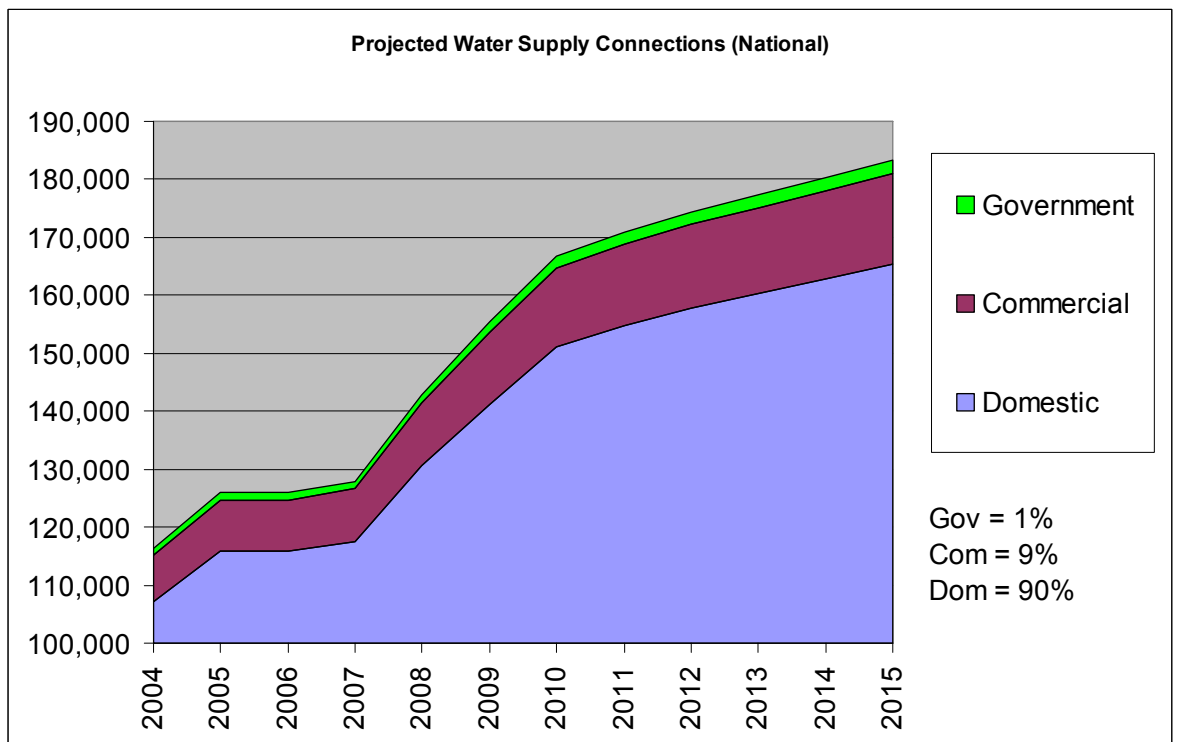


**Figure 7.5**  
Projection of national potable water produced, showing the effects of a comprehensive meter correction program

The process of converting illegal connections to legitimate connections will cause a steep rise in the number of connections that are ‘apparent’ to the billing system (which records only legitimate connections), as shown in Figure 7.6 and Figure 7.7.

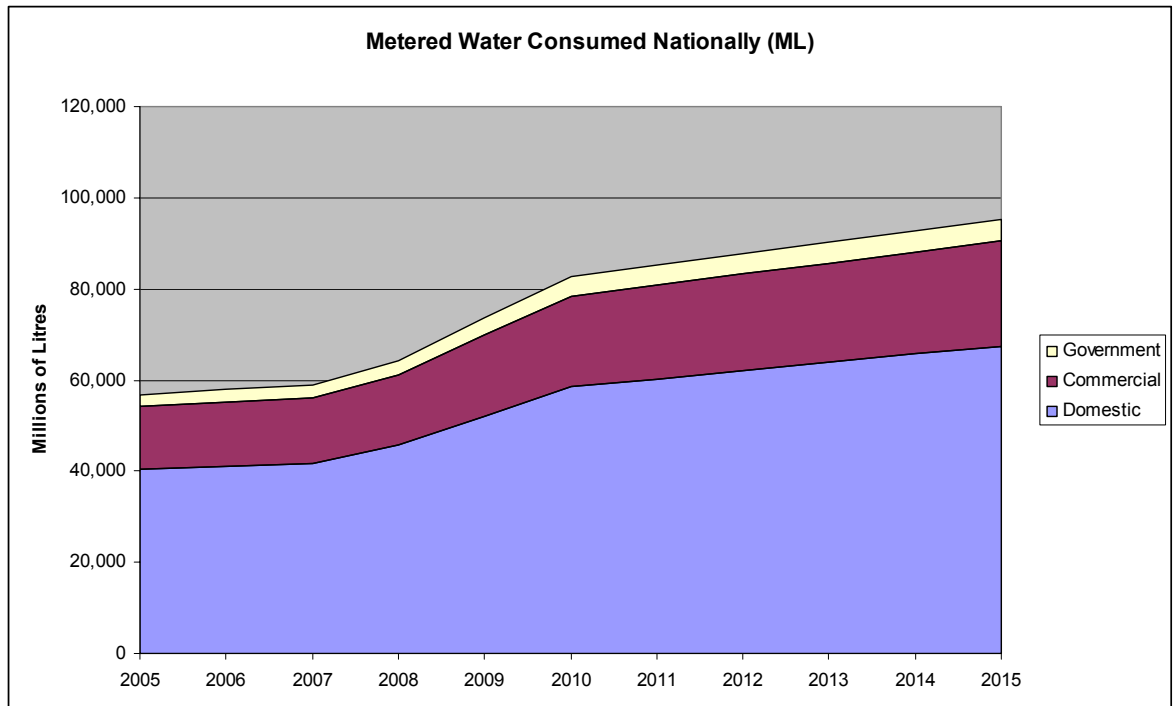


**Figure 7.6**  
National water supply legitimate connections vs connectible population 2004–15



**Figure 7.7**  
Increase in number of legitimate water supply customers

Based on the above, the estimated volume of metered water consumed rises nationally from about 57,000 ML in 2005 to about 95,000 ML in 2015 at an average annual growth rate of 5.3%, as depicted in Figure 7.8.



**Figure 7.8**  
**Metered water consumed**

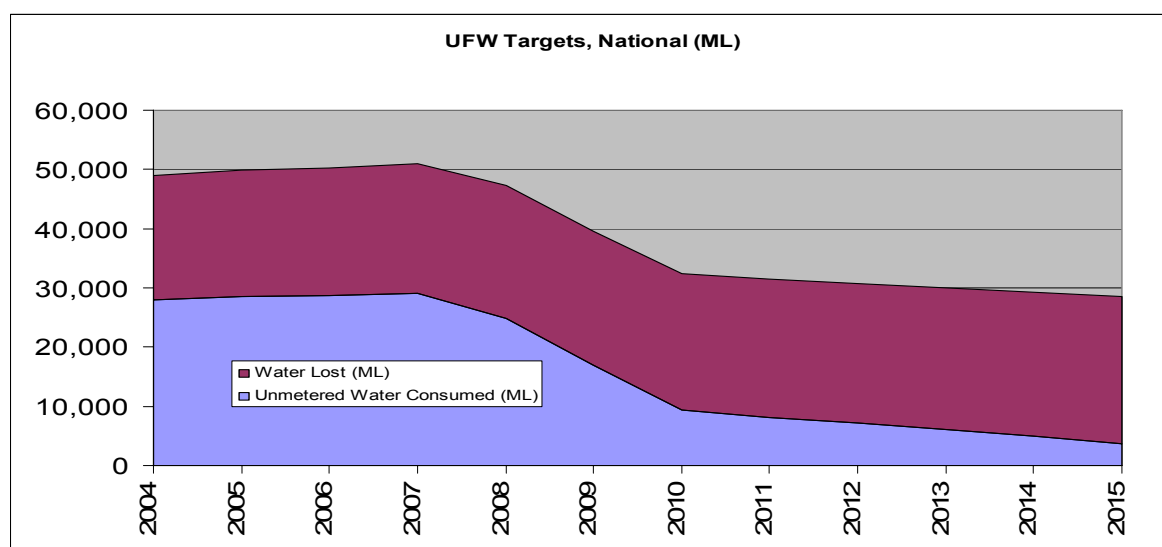
However, as indicated in Figure 7.5, the treated water volume and raw water intake requirement rises over the same period at the more modest rate of 1.5% per annum (consistent with the rate of urban population growth) rather than the 5.3% increase in ‘apparent’ water consumption, because much of the additional consumption is already being consumed, through illegal connections.

### UFW

UFW, defined here as the simple difference between the total volume of water delivered to the transmission mains from the treatment plants and the volume that is metered and invoiced by the billing system, averages an estimated 47% nationally in 2005 (about 50,000 ML) with 53% (31,000 ML) in the Central/Eastern Division, 38% (15,000 ML) in the Western Division and 50% (4,000 ML) in the Northern Division. The accuracy of UFW volume estimates suffer from a lack of metering at the transmission mains of most water treatment plants and apparent errors in customer metering and reporting of data by the billing system, but are believed to be reasonably accurate as they are consistent with known indicators such as annual chemical and electricity usage.

WSD plant and metering managers report anecdotally that there is a high prevalence of illegal connections in most urban areas, reaching as high as 50% of all connections in some areas. In addition to illegal connections, it is widely agreed that many of WSD’s customer meters are old and inaccurate and that legitimate connections are commonly under-billed. It is emphasised that the actual incidence of illegal connections and faulty metering has not been specifically determined and a detailed survey of meters to measure this is urgently required. There is however general agreement within the WSD that illegal connections and faulty meters are responsible

for the majority of UFW and that leaks from the transmission and distribution systems are therefore not the main source. For the present analysis, a consensus estimate has emerged among plant managers across the three divisions, developed during a series of workshops on the tariff, that water lost through leaks in the transmission and distribution mains is about 20% of the total volume delivered by the treatment plants and that 20% UFW overall is a reasonable target for WSD to attain over the next ten years. (The estimate of the volume lost due to leaks will be improved once the recommended metering survey is completed.) This implies that the balance of UFW at present, 27% of treated water nation-wide, is accounted by illegal connections and faulty meters. In principle, these losses can be reduced close to zero well within the ten year period. These targets are depicted graphically in the Figure 7.9.



**Figure 7.9**  
**UFW targets**

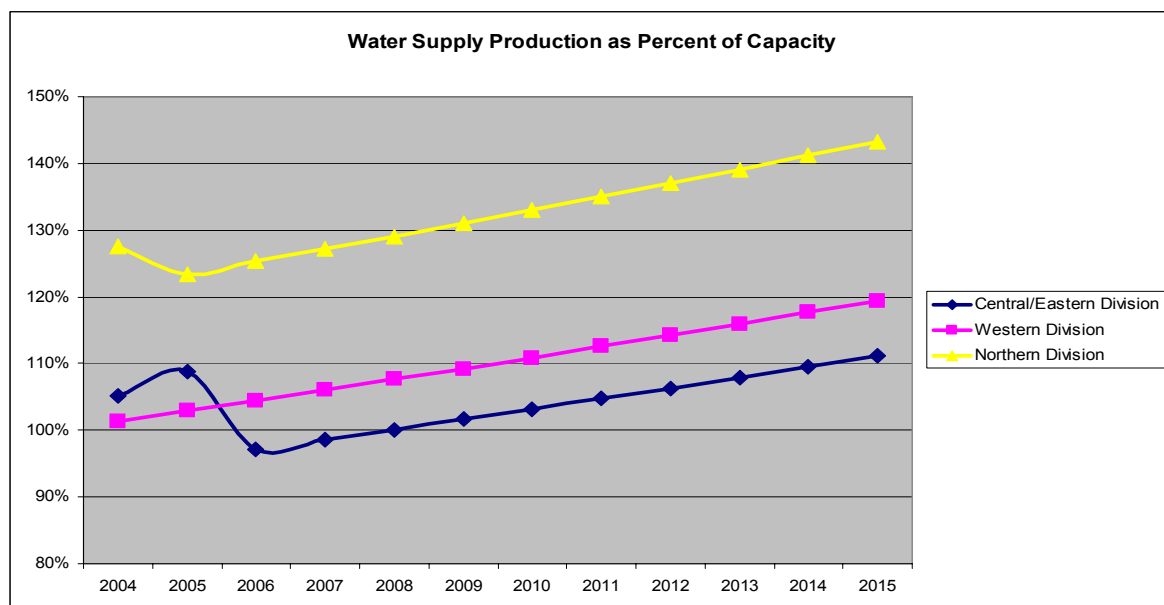
### **Water supply production versus capacity**

Nationally and especially within the Western and Northern Divisions, it appears that, barring new investments in treatment plant capacity expansion, existing water treatment capacity which is near or above full-utilisation even now will become increasingly strained over the ten year period at new-customer connection and consumption rates of approximately 1.5% growth per annum, as shown in Figure 7.10.

## **7.7 SYSTEM UNIT COSTS: LARGE SYSTEMS VS. SMALL SYSTEMS**

The estimates of costs of operating the water treatment and supply systems throughout Fiji for tariff review purposes are based on the objectives of the reform process, which include higher overall performance (reliability and efficiency), improved asset reliability through improved asset protection (repairs and maintenance), better protection of the health and safety of workers and higher water quality standards, among others. An examination and comparison of average costs of water supply (and sewerage service, discussed below) across large and small systems (Nadi-Lautoka regional and Sigatoka water supply systems; the Suva-Nausori and the Northern Division water supply systems) indicate that apparent differences in unit costs are

largely due to differences in quality of service and output rather than to differences in volumes and that applying consistent quality and operating standards across all such systems homogenises unit costs. In this light, the following principle is adopted for the purpose of tariff analysis: wherever the WSD assumes responsibility for commercial operations in water supply (and, as required in recent legislation, sewerage), consistent standards in regard to water quality, delivery reliability, asset management and protection, worker health and safety and all other significant parameters will apply. Where different quality standards exist (in small systems compared to large systems), such differences will be addressed and necessary expenditure will be made to rectify them.



**Figure 7.10**  
**Water supply production**

The same principle does not apply, however, to rural water supply systems, because rural systems are not and, in the foreseeable future will not be, incorporated into WSD's commercial operations. Rural water supply investments are wholly funded by the Government as a social service; the water produced is not treated and delivery standards are not consistent. The WSD is involved in such systems essentially as contractors to the Government for the purpose of initial installation and occasional maintenance services but the facilities belong to and are the responsibility of the beneficiary communities.

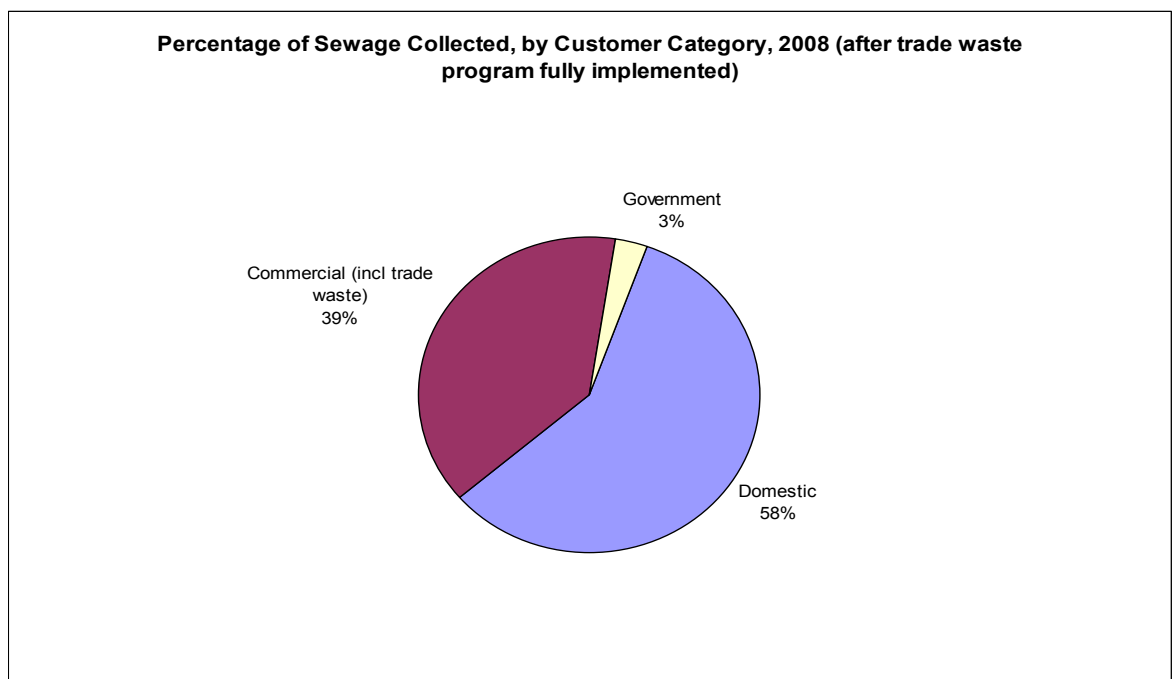
In summary, as consistent quality, operational and reliability standards are defined and implemented through the reform process for all of WSD's commercial operations in large and small urban areas, unit-cost differences among isolated systems under WSD's responsibility will diminish. However, there will remain a significant and widening divide between the WSD's (urban) operations and the government-funded and community-operated rural water supply projects.

## 7.8 SEWERAGE SERVICE

A similar analysis of projected connections and treatment requirements as presented above for the water supply in Section 4.1 is presented below for the sewerage service.

### 7.8.1 Connections and volume projections

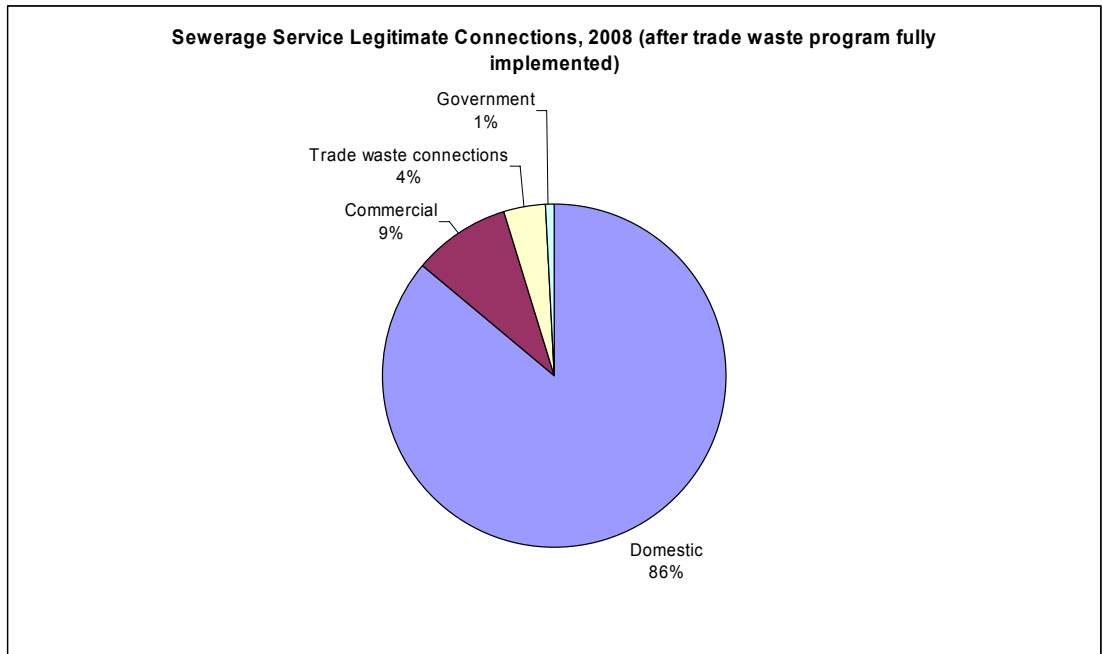
As the trade waste component of the TA is intended to make far-reaching impacts on the sewerage service system, we present a picture of the sewerage services in 2008, the first year in which it is expected that the trade waste component will be fully implemented. Using 2005 as the base year, there will be an estimated 28,000 legitimate sewer connections in 2008 and an unknown number of illegal sewer connections (assumed to be few). In 2008 nationally, about 86% of sewer connections will be domestic, 13% will be commercial including trade waste connections<sup>6</sup> and 1% will be government. Approximately 16,700 ML of sewage will be treated nationally in 2008, of which about 12,700 ML will be produced by WSD customers connected to the sewage systems and the balance, 4,000 ML, is due to inflow and infiltration. Of the total volume of sewage produced by WSD customers, about 58% will be due to the domestic sector, 39% to the commercial/industrial sector including trade waste connections and 3% to government. Across divisions, about 43% of the total sewage volume will be treated in the Central/Eastern Division, 53% in the Western Division and 4% in the Northern Division. These percentage distributions are depicted graphically in Figure 7.11 through to Figure 7.13.



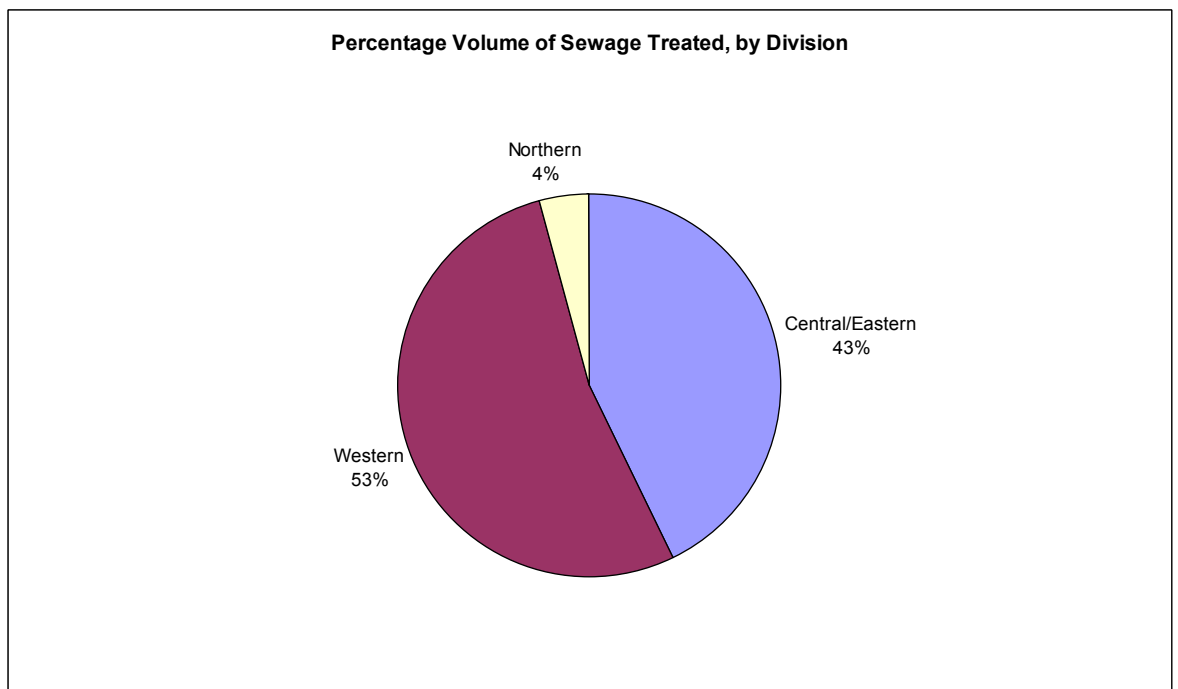
**Figure 7.11**  
**Percentage of sewage collected**

<sup>6</sup> About 30% of commercial and government connections are expected to be converted to trade waste connections once the trade waste program becomes fully operational in 2008.





**Figure 7.12**  
**Sewerage service legitimate connections**



**Figure 7.13**  
**Percentage volume of sewage treated**

The number of sewer service connections in all divisions is far less than the number of water supply connections. Based on the 1996 census data, the number of households connected to the sewer system as a proportion of connectable households in 2008 is greatest in the Western Division at about 23%, followed by the Central/Eastern Division at about 15% and the Northern Division at about 9%. Nationally, the average

proportion of sewer-connected households to connectable households in 2008 is about 17%.

All customers connected to WSD's sewerage service are also WSD water supply customers, but only a fraction of water supply customers are sewerage service customers. A conceivable, but distant, goal is to bring the ratio of sewerage customers to water supply customers equal or close to 100%, leading with the customer categories who pose the greatest environmental risks. In Fiji, as in most countries, these are the commercial/industrial customers and this is what justifies a focus on trade waste programs. In this context, the Western Division leads the rest of the country with 26% of domestic water supply customers connected to sewer and 56% of commercial/industrial. The corresponding percentages are 17% and 27% in Central/Eastern and 10% and 35% in the Northern Division, respectively. As seen, the commercial/industrial sector leads the domestic sector overall by a wide margin, in accord with sensible environmental practice.

However, there is a long way to go. There is strong awareness in Government of the environmental benefits of well-functioning and extensive sewerage systems and a high priority has been placed on expansion of the systems in Fiji. In accordance with the *Strategic Development Plan 2003 – 2005*<sup>7</sup>, in 2002 the Government planned that '60% of the urban population (should have a) sewerage connection by 2005' – a goal that, while unattainable, provides a clear signal to the WSD that the Government expects concerted action in this area.

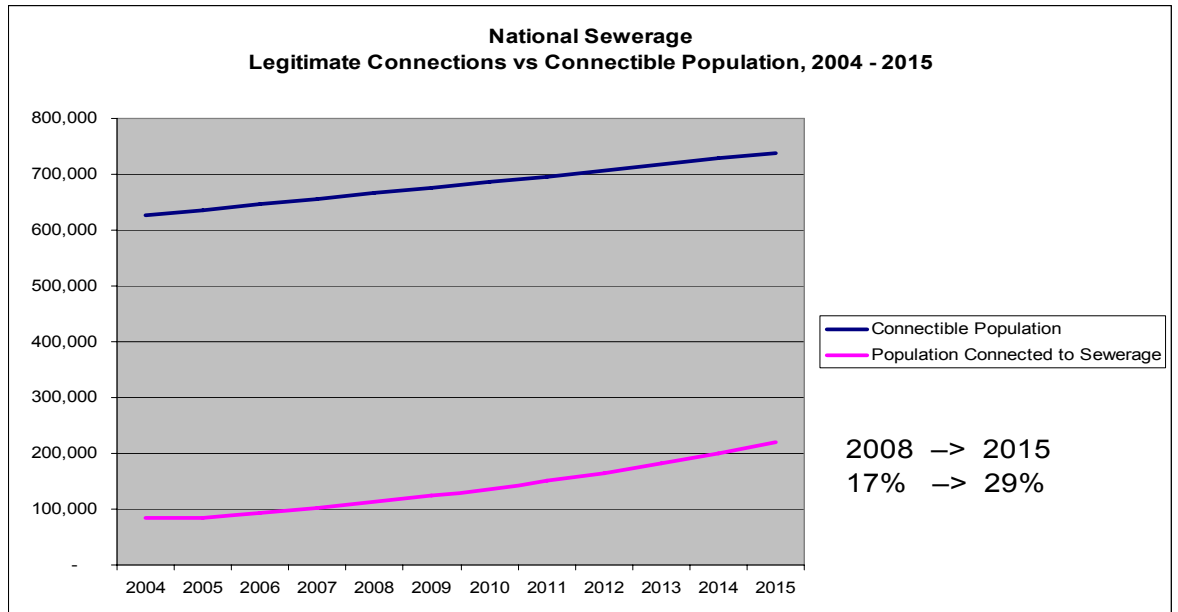
For present purposes, it is assumed that an accelerated rate of increase in sewerage connections might be sustained at 10 percent per year, equivalent to slightly more than 2,000 new connections in all Divisions annually in the near term, increasing to about 4,500 new connections annually by 2015. Factors that constrain the rate of new sewer connections are chiefly the availability of capital finance and manpower to survey new routes, liaise with households and proprietors, and install the connections; and the geographical extent of new connections which is likely to increase over time. An allowance has been included in the estimated capital budget for meeting the infrastructure costs of this rate of new sewer connections, but the required expenditure level nationally can be reliably estimated only after a detailed long term sewerage master plan has been prepared. Accordingly, the present estimates of population connected to the sewerage systems and the number of sewerage connections by customer category are shown in the Figure 7.14 to Figure 7.17.

As shown in Figure 7.14, given present assumptions, the percent of connectable (urban) population that is connected to sewer rises from 17% in 2008 to 29% by 2015. Under the constraints discussed above this is assumed to be a practical target for WSD to achieve.<sup>8</sup>

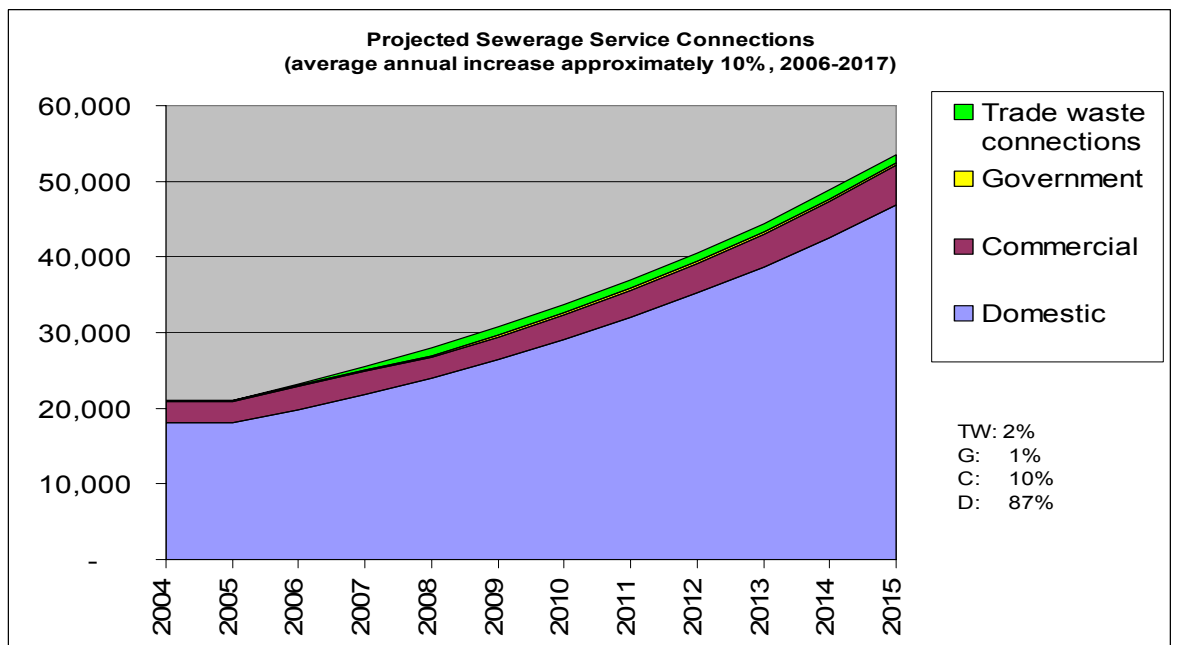
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<sup>7</sup> 'Rebuilding Confidence for Stability and Growth for a Peaceful, Prosperous Fiji', *Strategic Development Plan 2003 – 2005*, Parliamentary Paper No 72 of 2002, November 2002.

<sup>8</sup> though still well below the target indicated in the Strategic Development Plan 2003 – 2005.

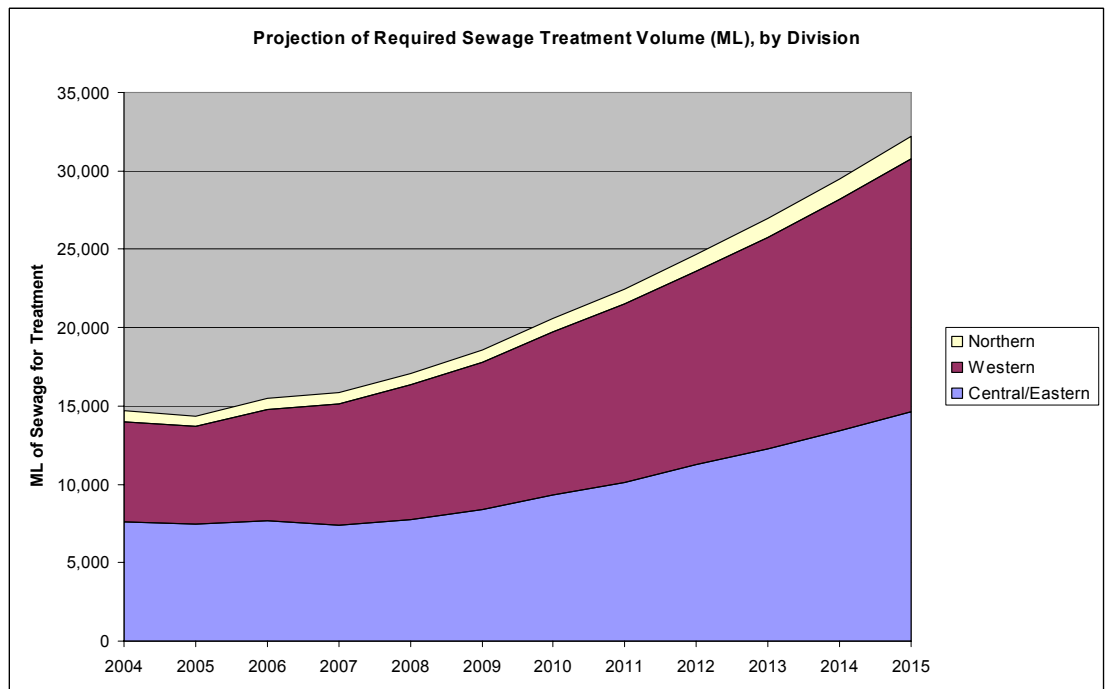


**Figure 7.14**  
**National sewerage legitimate connections**



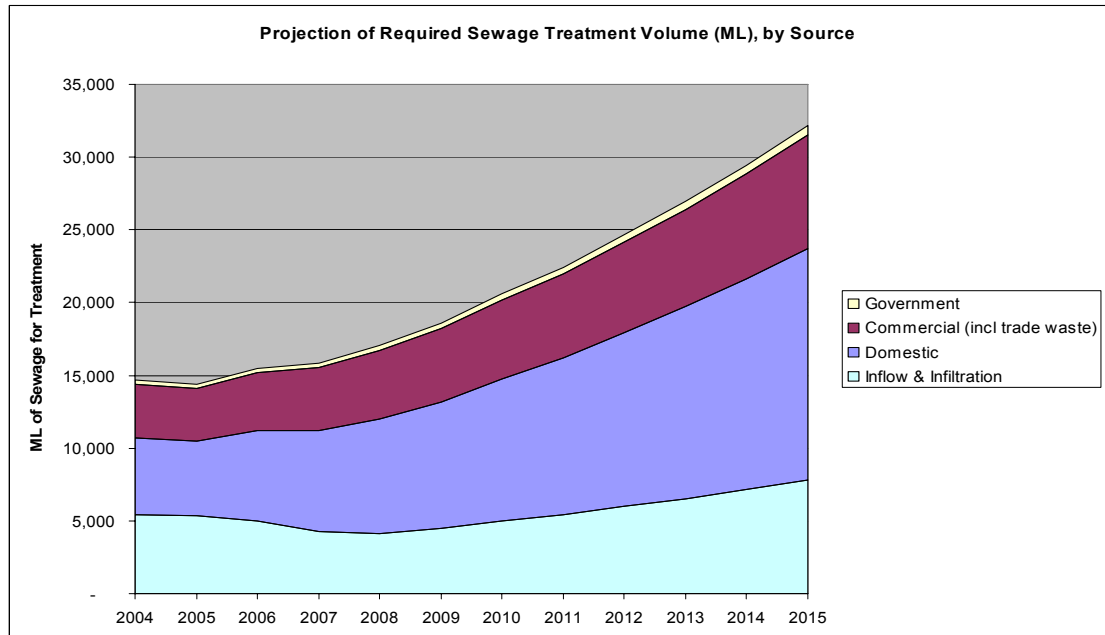
**Figure 7.15**  
**Growth in sewerage legitimate connections**

As indicated, the total number of sewerage connections rises from about 28,000 in 2008 to about 54,000 by 2015. Based on the above rate of new connections, the required volume of sewage to be treated by division is estimated to increase annually as shown in Figure 7.16.



**Figure 7.16**  
**Projection of required sewage treatment**

As indicated, total sewage treatment volumes (including inflows and infiltration) rise from slightly less than 16,700 ML in 2008 to about 33,000 ML in 2015.



**Figure 7.17**  
**Projection of required sewage treatment**

### **7.8.2 Inflow and infiltration**

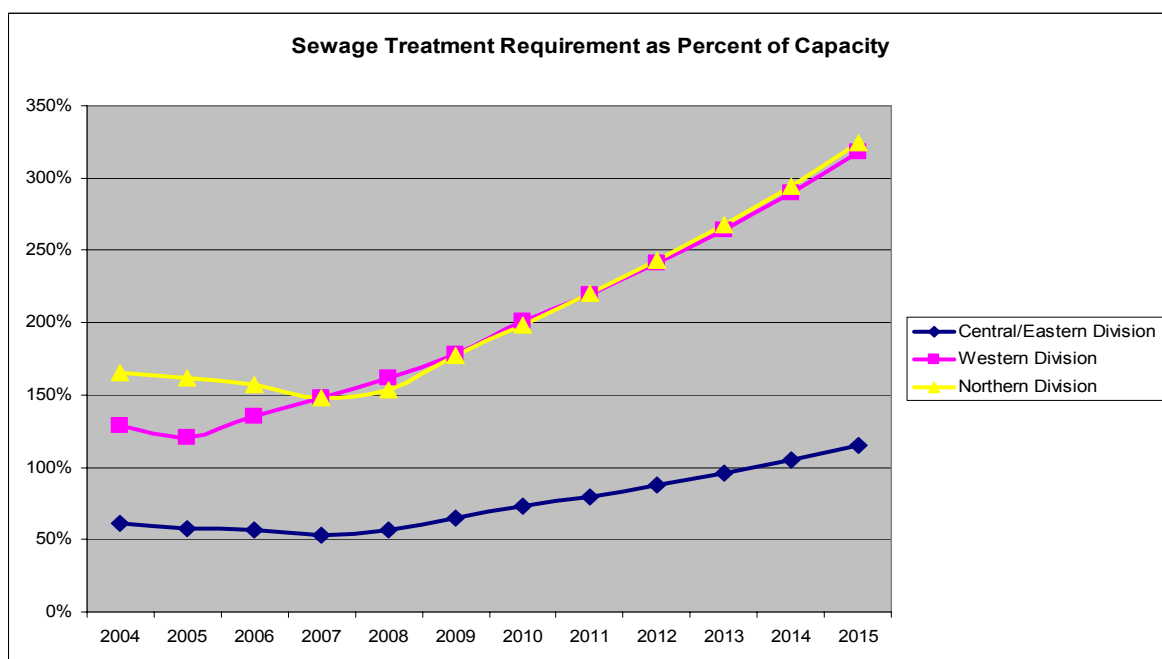
Inflow and infiltration (I&I), defined as the volume of wastewater entering the sewage treatment plants which is not produced by sewerage customers (is largely storm water leaking into the collection system at various points), has not been measured for WSD's sewer collection and treatment systems. Sewage treatment plant managers, however, have informally estimated this volume for the Central/Eastern and Western Divisions and these estimates are used for present purposes. I&I is not known for the Northern Division, but the rate estimated for the Central/Eastern Division is for present purposes applied there, until I&I studies to alter or confirm the estimate have been carried out.

It is estimated that, for the Central/Eastern Division, I&I is currently about 100% of produced sewage volume that is each unit of produced sewage is matched by a unit of I&I which results in the observed dilution of flows into the sewage treatment plants in Central/Eastern. It is further assumed; however, that as work continues under the Suva-Nausori Upgrade Project (and maintenance works extending beyond completion of the project) the I&I rate will gradually diminish towards 40%, reaching that level by 2008. This will have the effect of reducing the total sewage volume that would otherwise have to be treated by existing capacity, thus helping to contain costs. However, as a consequence of the accelerated rate of new sewer connections and extension of the collection systems as discussed above, the total I&I volume begins to climb after 2008. A similar pattern is assumed for the Northern Division.

The current I&I rate estimated by STP managers in the Western Division is markedly less, however, at 25%, because of the drier conditions there, and possibly because the sewage collection system is in better shape (though that is not confirmed). It is assumed that the rate of 25% is maintained in the Western Division throughout the planning period.

### **7.8.3 Sewage treatment requirement vs. capacity**

Existing sewage treatment capacity in the Central/Eastern Division appears to be adequate to handle increasing flows virtually throughout the ten-year planning period (though expenditure will be required to restore capacity that is not currently functioning properly if effluent standards are to be raised and sustained as required under current legislation). In the Western and Northern Divisions, however, it appears that, barring new investments in sewage treatment plant capacity expansion, existing capacity which is currently above full-utilisation will become increasingly strained over the ten year period (resulting in increasingly inadequate treatment services), as shown in Figure 7.18.



**Figure 7.18**  
**Sewage treatment requirement**

## 7.9 PROJECTED OPERATING COSTS

Under institutional reform, the cost structure of the WSD will change with respect to the cost structure that applied up to the end of 2004 as a Government department, for two fundamental reasons:

- *‘Hidden’ costs that were distributed widely among government stakeholders become explicit and focused within the WSD:* some costs that were implicit or hidden under the old structure and shared to varying degrees across a number of Government entities including the Ministry of Works and Energy (MWE), the Ministry of Finance (MoF), the Lands Department, and Native Land Trust Board among others, now become explicit and transferred to the new service provider, the Water and Sewerage Department (WSD). These costs chiefly relate to:
  - the transfer of responsibility for water supply and sewerage assets from the MWE and central government to the WSD, with explicit absorption by the WSD of capital costs, asset management costs, asset financing costs, and asset depreciation
  - the transfer of environmental and raw water resource costs from the MWE, the Department of Environment, the city councils and health authorities and the Lands Department to the WSD, including the costs of inspections and sound disposal of sludge and effluent and payments to landowners of catchment areas for raw water.
- *Performance standards increase, entailing higher expenditures in both capital investment and operations:* other costs relate to functions which have long been recognised as responsibilities of water supply and sewerage operations but which were generally not performed to an adequate standard under the Government

department structure. These include environmental management, sustaining quality and reliability of the urban water supply, protection of assets and protection of the health and safety of personnel working in the sector and of the public at large. As part of the institutional reform of the water supply and sewerage sector, performance in these areas must increase and the higher standards will be enforced under existing and new legislation.

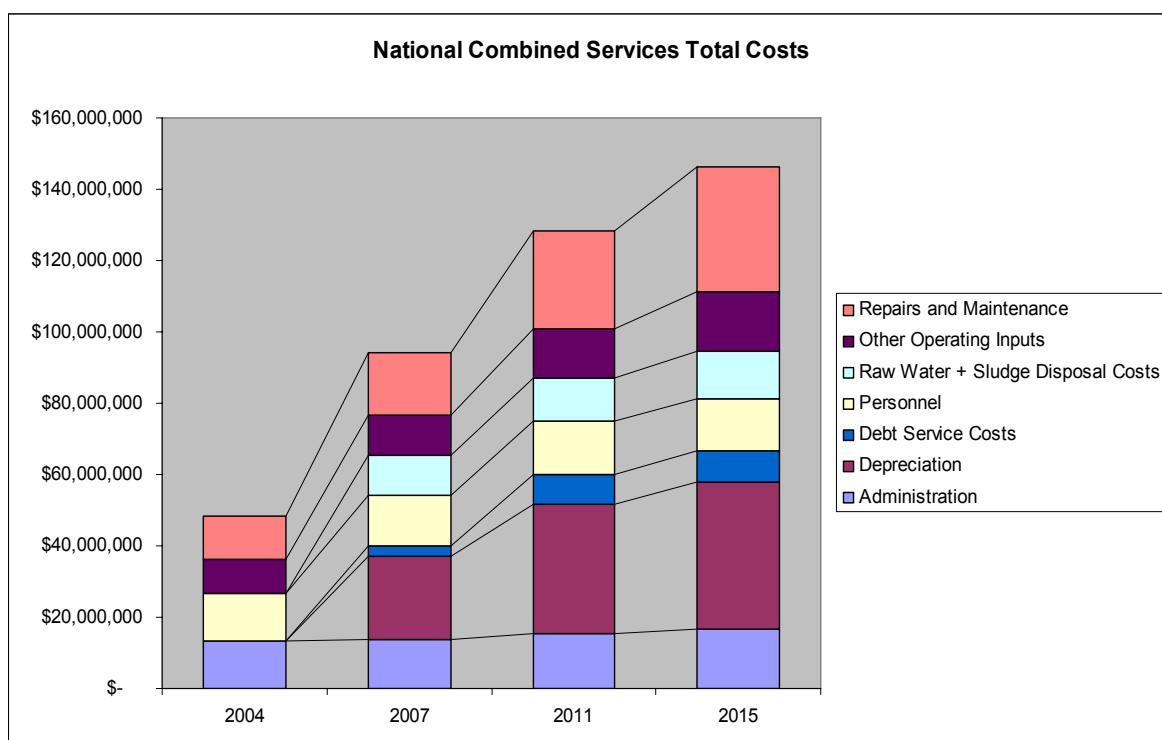
‘Hidden’ costs are made explicit by transforming the WSD’s cost accounting from the previous cash-based system to a cost-accrual based system typical of commercial and semi-commercial entities. The tariff review represents a first step towards this transformation and is based upon a core set of financial statements and projections consistent with accrual-based accounting (which, for example, explicitly recognises asset depreciation as a key component of operating costs). The transformation to accrual-based accounting has been carried forward through 2006 by the financial management component of the PMU Reform Project. The tariff review has therefore been conducted in close coordination with the PMU reform processes (and indeed was under their direction during 2006). However, in 2007, reform is still in process. Key components of the tariff that are essentially assumptions now still need to be confirmed or altered when the reform processes, particularly in regard to financial management and asset management, are complete.

In the discussion of costs and the accompanying figures that follow, it will appear as if the costs of operating the water supply and sewerage sector following institutional reform are substantially higher than the costs were in the years up to 2004, when the sector was operated under a Government department. However, a direct comparison of costs before and after institutional reform is a false comparison, in the sense that the financial accounts prior to reform fail to reflect certain costs that, even though ‘hidden’, did in fact always exist they are now explicitly recognised in the accounts after the reform process. Making such a comparison in the present context is nevertheless desirable, if only to help the Government and other stakeholders to understand the implications of coming to grips with the water supply and sewerage performance and reliability issues and their costs.

In a comparison, then, between recognised costs in 2004 (prior to reform) and 2007 (after reform is implemented) the major differences will relate to the following cost components:

- asset depreciation
- debt service costs
- raw water purchase and sludge disposal costs
- ‘other’ operating costs including occupational health and safety
- repairs and maintenance.

Overhead costs such as personnel and administration will differ by a far lesser degree than the above items. After 2007, overall costs will continue to rise, but mainly in response to demand-driven system investment requirements, asset accumulation and staffing. These changes are shown graphically (for WSD’s combined water supply and sewerage services) in Figure 7.19.



**Figure 7.19**  
**National combined services total costs by major component**

As indicated, overall costs of the sector which under the pre-reform accounting system were measured at about F\$48 million annually<sup>9</sup> increase to about \$94 million as measured in 2007. Apart from annual debt service cost increasing from about \$3 million to about \$9 million between 2007 and 2011, costs rising to about \$128 million in 2011 and \$146 million in 2015 are primarily growth-related. Though there are some growth-related effects between 2004 and 2007, the great majority of the difference is due to explicit recognition of costs that were not accounted for previously, as discussed below.

### 7.9.1 Depreciation

Each year that the WSD uses assets to produce and distribute potable water and to collect and treat sewage, the assets progress one year further to the end of their useful lives. The value of the assets ‘used up’ in one year is that year’s depreciation charge and is one of the prime asset-related operating costs (the other being repairs and maintenance, discussed below). This cost did not appear in WSD’s predecessor’s accounts, but is assumed to be included in the WSD’s accounts for 2008.

The value of depreciation in any year depends on the assets in service, their initial cost and the design life and the life remaining of each major component of the assets. Each major asset component has to be assessed separately, as each will have a different

<sup>9</sup> The actual accounts reflect a somewhat lesser figure due to a large number of staff vacancies then (which persist to the present). The above figure, for comparison purposes, assumes full staffing in 2004 onwards.



design life; for example, civil works are usually designed to last 50 years, whereas a truck with adequate maintenance will last five years.

For the tariff review, in consultation with the PMU Reform Project, assets were valued first with reference to the replacement-value estimates in the department's Asset Register which was completed in 1999, the 1999 assets were revalued to 2004 prices using an inflation factor; then assets built since 1999 (initially from the Nadi-Lautoka and Suva-Nausori upgrade projects, then from continuing investments over the ten year period to 2015) were added; and design-life and remaining-life assumptions for each asset component were employed to estimate an annual depreciation charge through the period. The detailed calculations of this are tabulated in the Tariff Appendix under the Table labelled 'Capital Expenditures and Depreciation.'

In 2006, the PMU Reform Project engaged specialist expertise to update the asset register. The Asset Management and Financial Management Specialists re-estimated the WSD's depreciation costs based on the new asset register, taking into account additional work in parallel on preparation of the WSD's capital development program. The following estimates are extracted from the detailed tabulation in the Tariff Appendix.

The replacement value of water supply assets in 2004 is about \$508 million, increasing to about \$1.3 billion in 2015<sup>10</sup>. The value of net fixed assets in the water supply sector from which accumulated depreciation has been deducted is about \$167 million in 2004 increasing to \$545 million in 2015. The corresponding depreciation charges beginning in 2007 for the water supply sector are \$16.2 million increasing to \$29.6 million in 2015.

The replacement value of sewer service assets in 2004 is about \$184 million, increasing to \$454 million in 2015. The value of net fixed assets in the sewer sector is about \$60.8 million in 2004 increasing to \$176.1 million in 2015. The corresponding depreciation charges in 2007 for the water supply sector are \$6.8 million increasing to \$11.5 million in 2015.

WSD's total depreciation charges for the combined services are thus \$23.1 million in 2007 increasing to \$41.1 million in 2015.

## **7.9.2 Debt service**

Foreseeable debt service arises from the two external loans that the Government has taken on behalf of the WSD that will be transferred to WSD's responsibility once the reform process is complete. These are:

- The JBIC loan to finance the Nadi-Lautoka Upgrade Project which commenced disbursements in 2000 and was completed in 2005. The loan amount was F\$39.4 million with a total Government counterpart contribution of about \$34 million<sup>11</sup>. The repayment period is 25 years, with an annual interest rate of 2.5%. The grace period, during which no repayments are made to the JBIC but

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<sup>10</sup> All values in financial terms, i.e., inflation-adjusted dollars.

<sup>11</sup> Actual, necessitated by project cost over-runs. The planned counterpart contribution was less.

interest is accrued, is seven years from the commencement of disbursements. First payments will thus be due in 2007. Total debt service on the loan under these conditions, including repayments of interest and principal, will be approximately \$3.1 per annum from 2007.

- The ADB loan to finance the Suva-Nausori Upgrade Project which commenced disbursements in 2005<sup>12</sup> and will be completed in 2008<sup>13</sup>. The loan amount was US\$42.3 million with a Government counterpart contribution of about US\$25.4 million. The repayment period is 25 years with an annual interest rate of 3.29%. The grace period is five years from the commencement of disbursements, thus first payments will be due in 2010. Total debt service on the loan under these conditions, including repayments of interest and principal, will be approximately F\$5.5 per annum from 2010.

Total debt service payments are thus \$3.1 per annum in 2007 rising to \$8.6 million per annum from 2010 through the balance of the ten year period.

### **7.9.3 Raw water and sludge disposal costs**

The costs of raw water acquisition have not been included in the WSD's predecessor accounts as they have been borne by the Lands Department, the agency responsible for making lease payments to the landowners of the water catchment areas throughout the country. This responsibility will be transferred to WSD once institutional reform is complete. Since the WSD will be a quasi-commercial organisation it is assumed that the value of raw water acquired for public consumption will be re-assessed. For analytic convenience the payment for raw water is calculated on a water volume basis rather than as a lease payment for land<sup>14</sup>. There is no precedent in Fiji for valuing the water (in large volume) extracted from customary land; the eventual value will be based on negotiations with landowners. For present purposes, an initial estimate of this value has been made of F\$100 per ML<sup>15</sup>.

The disposal of sludge as a by-product of sewage treatment has not been a cost item to date because sludge has not, until recently, been disposed of or used away from the treatment plants. However, there is a recognition that sludge will have to be transported to properly designed and operated land fill sites and the present estimate

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<sup>12</sup> With some government counterpart funds disbursed in 2004.

<sup>13</sup> As mentioned in the Note at the beginning of this report, implementation of the Suva-Nausori upgrade project has been seriously delayed, and it now seems unlikely that the Project will be completed by 2008. It is not clear, however, what specific effect this will have on the schedule of disbursements or (in particular) on the repayment schedule. For present purposes, the repayment schedule has not been altered from what it was understood to be in 2005. Subsequent adjustments to the disbursement and repayment schedules that may become necessary will have only a minor effect on the total costs of the WSD.

<sup>14</sup> This approach is justified under the assumption that an agreement for fixed lease payments would have to be periodically re-negotiated with landowners anyway, as the total uptake of raw water increases through time. Thus lease payments are ultimately related to water volumes.

<sup>15</sup> Based on the price paid in Sydney, Australia.

by STP managers is that this will cost F\$20/tonne. Sludge production is based on total sewage inflows at the rate of one tonne of sludge per ML of sewage.

The estimated cost of disposing of treated effluent is currently zero, implicitly assuming that effluent quality from now on is within standard and that disposal works have been approved by the Department of Environment. The estimate will have to be revised if capital and recurrent costs to achieve this compliance are incurred, an issue is still to be resolved in the context of the reform process.

Under these assumptions the cost of raw water acquisition will be about \$11.0 million per annum in 2007 rising to \$12.4 million per annum in 2015. Sludge disposal will cost \$0.3 million in 2007 rising to \$0.7 million in 2015.

#### **7.9.4 Other operating inputs**

‘Other’ operating inputs include the costs of electricity and treatment chemicals, fuel and oil and the non-salary costs of new-capacity functions that will be taken up by the WSD when institutional reform is complete, such as fully-compliant occupational health and safety programs and customer services. These costs rise from about \$11.2 million in 2007 to \$16.9 million per annum in 2015.

#### **7.9.5 Repairs and maintenance**

Repairs and maintenance costs comprise the second of two major asset-related operating costs (the first is depreciation, as discussed above). Repairs and maintenance expenditure is directly related to the stock of assets employed in operations and the age of the assets (the older they are, the greater the annual expenditure required to keep them operating at full capacity).

It is clear that the WSD’s predecessor organisation has substantially under-spent on Repairs and maintenance in the past (some F\$12 million in 2004), as evidenced by the advanced state of disrepair of many of the assets for which there is (or should be) a significant remaining life. New assets that have been or are being installed under the two upgrade projects on Viti Levu will suffer this fate unless repairs and maintenance activities are strengthened and annual expenditures increased. That said, it is not possible at present to estimate with confidence what an ‘adequate’ repairs and maintenance budget for WSD should be, in the absence of a detailed review of assets, the establishment of an asset management system and reasonable estimates at the ground level, stemming from such a review, of what needs to be done to restore assets to peak performance and to keep them in that condition through the rest of their useful lives. Some progress with the asset management system and other issues related to maintenance was made by the PMU during 2006<sup>16</sup>. The estimates now in the financial model need to be validated and adapted as necessary to actual operating experience once the WSD is fully established as an autonomous and corporatised entity. For present purposes, a repairs and maintenance budget that is assumed sufficient to

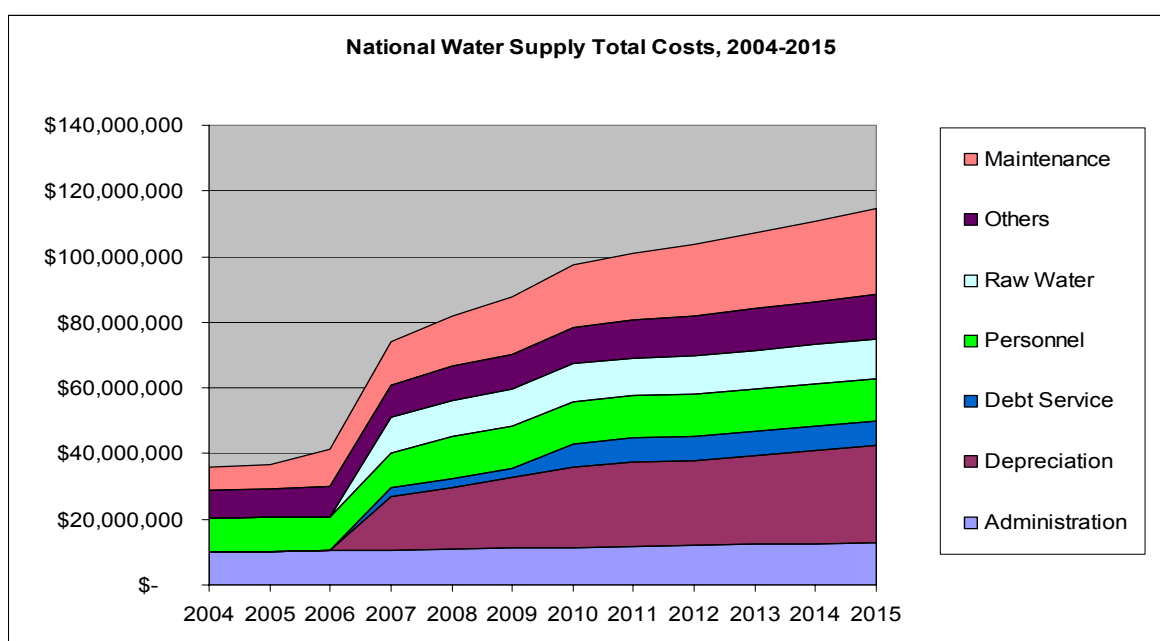
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<sup>16</sup> However, no changes were made by the PMU to the underlying parameters of the repairs and maintenance estimate in the 2005 version of the financial model.

maintain assets at peak performance (after restoration works are completed<sup>17</sup>) is calculated as two% per annum of the replacement value of assets in service, a value that has been determined in consultation with the PMU Reform Project and is referenced upon reported values of such expenditure by utilities in Europe and Australia<sup>18</sup>.

Under these assumptions, the amount budgeted for repairs and maintenance for the combined services is \$17.8 million in 2007, rising to about \$35.1 million per annum in 2015.

The following figures show graphically how costs are projected to change through time for the water supply sector, the sewer service sector and for the combined WSD services, based on the above approach and assumptions. A detailed tabulation of projected WSD costs is provided in the Tariff Appendix under the tables labelled 'Market data' and 'Recurrent costs'.



**Figure 7.20**  
**National water supply costs**

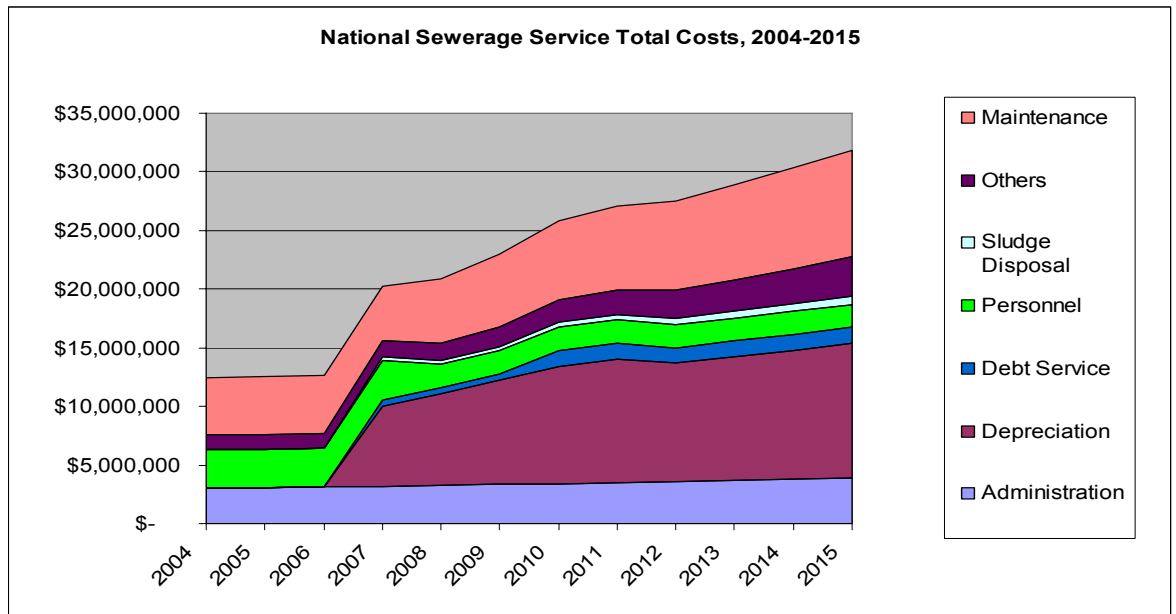
For the national water supply, total costs rise from \$74.1 million in 2007 to \$114.6 million in 2015, chiefly due to increases in depreciation, repairs and maintenance and debt service (all asset related, driven by system growth).

<sup>17</sup> Restoration works, the costs of which over several years have been roughly estimated for present purposes, are included in the capital budget. Repairs and maintenance is, in contrast, an operating cost item.

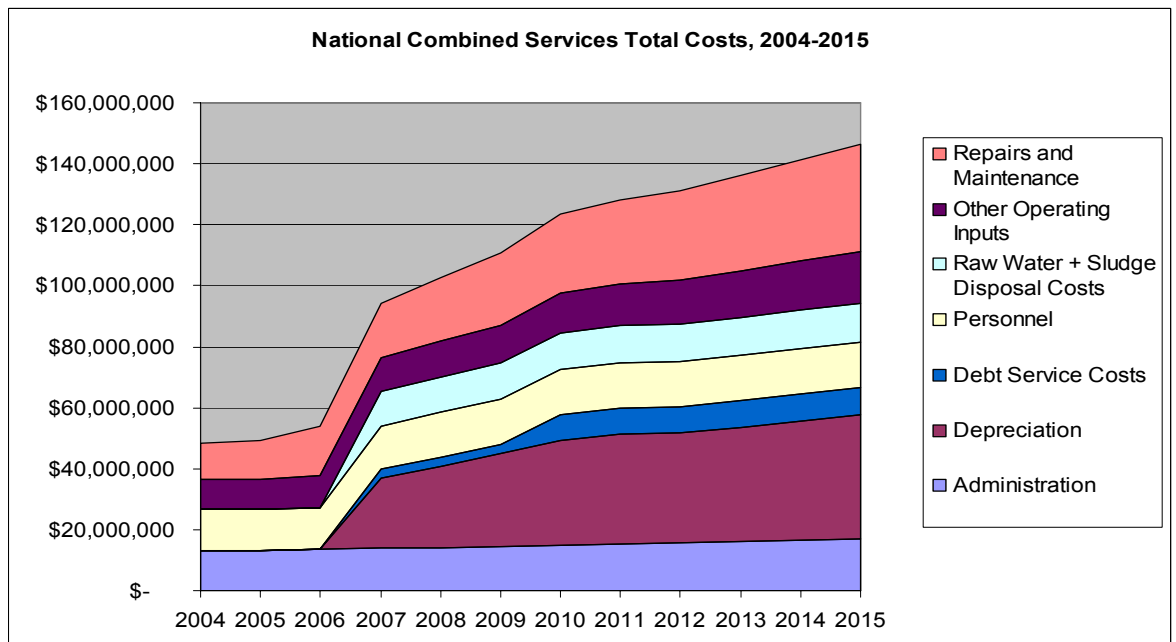
<sup>18</sup> GHD's Approach to Assisting Clients to Develop Accurate Future Maintenance Budgets When Constructing AMPs [Asset Management Plans], GHD Asset Management Group, Life Cycle Group (Melbourne), January 2001

For the national sewerage service, total costs rise from \$20.3 million in 2007 to \$31.8 million in 2015. As for the water supply sector, cost increases are chiefly due to increases in depreciation, repairs and maintenance and debt service (all asset related, driven by system growth).

For the national combined services, annual operating costs rise from \$94.3 million in 2007 to \$146.4 million in 2015.



**Figure 7.21**  
**National sewerage service**



**Figure 7.22**  
**National combined services**

## 7.10 PROJECTED CAPITAL COSTS

The PMU Reform Project team has developed a draft capital development program for the WSD to 2015, to reflect the costs of ongoing investments in system upgrades, replacement of assets, backlog maintenance and certain costs (example consulting costs, metering inspection and correction) associated establishment of the corporatised entity. The capital program developed by the PMU in 2006 is summarised overleaf as Table 7.1.

The sum of capital expenditures expected over the period 2007–15 include:

- \$316 million to complete water supply upgrade projects, including the ongoing multilateral financed projects on Viti Levu and a provision for \$30 million per annum between 2010 and 2015 to permit continued investment in upgrades of the system nationally
- \$176 million to complete expansion and improvement of sewage collection and treatment plant capacity, including an allowance of \$10 million per annum between 2011 and 2015 to continue expansion of systems nationally
- a provision for \$91 million and \$30 million respectively to allow for replacement of water supply and sewerage assets (treatment plant equipment, pipes and pumps) as they wear out
- a provision for \$29 million and \$10 million for ongoing work to improve quality standards for the water supply and sewerage services across all divisions
- \$11 million for capital expenditures related to institutional reform, including office relocation, consultancy services, call centre set-up and branding activities and information technology development
- \$29 million for ‘backlog’ maintenance of existing assets to restore performance
- \$11 million for meter inspection, testing, and replacements to convert illegal water supply connections to legitimate connections and to correct faulty meters; and a further \$5.3 million for provision of new meters as required to meet demand for new connections.

Many of the sums indicated above are estimated, especially the investment requirements for expanding and improving treatment facilities; the ‘backlog’ maintenance requirements to meet environmental and occupational health and safety regulations, and the cost of asset replacements (including meters). These estimates need to be validated by detailed engineering assessment and costing, to be carried out over the first several years of operation of the corporatised entity. Periodic reviews of the capital budget (and its tariff implications) will be needed as operations proceed.

**Table 7.1 Projected capital expenditures**

Financial Years	2007	2008	2009	2010	2011	2012	2013	2014	2015	Totals
<b>Capital Expenditures</b>										
Consultancy Services	\$ 1,600,000	\$ 1,100,000								\$ 2,700,000
Updating Infrastructure Asset Register	\$ 400,000									\$ 400,000
Offices Relocation / New Buildings	\$ 1,000,000	\$ 2,000,000	\$ 1,000,000							\$ 4,000,000
Customer Services & Call Center Set-up	\$ 500,000	\$ 1,000,000								\$ 1,500,000
Information Technology (hardware & software)	\$ 1,200,000	\$ 1,200,000								\$ 2,400,000
Water Supply Investment Program	\$ 44,750,000	\$ 43,350,000	\$ 47,550,000	\$ 30,000,000	\$ 30,000,000	\$ 30,000,000	\$ 30,000,000	\$ 30,000,000	\$ 30,000,000	\$ 315,650,000
Sewerage Investment Program	\$ 32,500,000	\$ 38,300,000	\$ 39,675,000	\$ 14,850,000	\$ 10,400,000	\$ 10,000,000	\$ 10,000,000	\$ 10,000,000	\$ 10,000,000	\$ 175,725,000
Asset Replacement - Water										
Northern	\$ 2,938,025	\$ 67,500	\$ 71,400	\$ 57,120	\$ 49,651	\$ -	\$ 72,822	\$ -	\$ 99,960	\$ 3,356,479
Central Eastern	\$ 4,758,000	\$ 5,561,037	\$ 6,659,920	\$ 6,746,845	\$ 6,183,352	\$ 4,935,120	\$ 7,487,890	\$ 6,943,205	\$ 5,284,080	\$ 54,559,450
Western	\$ 2,714,253	\$ 5,605,730	\$ 2,829,153	\$ 4,077,736	\$ 3,061,194	\$ 3,194,491	\$ 4,035,975	\$ 4,253,618	\$ 2,873,668	\$ 32,645,817
Asset Replacement - Sewerage										
Northern	\$ 1,159,604	\$ 33,073	\$ -	\$ -	\$ -	\$ 64,029	\$ -	\$ -	\$ -	\$ 1,256,706
Central Eastern	\$ 1,408,829	\$ 1,408,829	\$ 4,272,210	\$ 1,465,521	\$ 1,736,574	\$ 1,551,298	\$ 1,449,326	\$ 1,408,829	\$ 1,408,829	\$ 16,110,246
Western	\$ 769,542	\$ 4,553,435	\$ 803,872	\$ 879,345	\$ 1,653,642	\$ 1,198,609	\$ 803,751	\$ 769,542	\$ 769,542	\$ 12,201,277
Asset Upgrade (Meet Quality Standards) - Water										
Northern	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000							\$ 9,000,000
Central Eastern	\$ 5,400,000	\$ 5,400,000	\$ 5,400,000							\$ 16,200,000
Western	\$ 1,133,333	\$ 1,133,333	\$ 1,133,333							\$ 3,400,000
Asset Upgrade (Meet Quality Standards) - Sewerage										
Northern			\$ 285,714	\$ 285,714	\$ 285,714	\$ 285,714	\$ 285,714	\$ 285,714	\$ 285,714	\$ 2,000,000
Central Eastern			\$ 821,429	\$ 821,429	\$ 821,429	\$ 821,429	\$ 821,429	\$ 821,429	\$ 821,429	\$ 5,750,000
Western			\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000	\$ 1,750,000
Backlog Remediation										
Environmental Remediation	\$ 100,000	\$ 100,000	\$ 100,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 300,000
OHS Remediation	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6,000,000
Backlog Connection Remediation	\$ 7,509,600	\$ 7,509,600	\$ 7,509,600	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 22,528,800
Routine Meter Testing/Repair/Replacement	\$ 1,247,570	\$ 1,247,570	\$ 1,247,570	\$ 1,247,570	\$ 1,247,570	\$ 1,247,570	\$ 1,247,570	\$ 1,247,570	\$ 1,247,570	\$ 11,228,130
New Meter Connections	\$ 189,016	\$ 780,428	\$ 1,235,810	\$ 1,132,083	\$ 405,349	\$ 383,439	\$ 391,265	\$ 399,239	\$ 357,351	\$ 5,273,982
<b>Total Capital Expenditures</b>	<b>\$ 116,277,773</b>	<b>\$ 125,350,534</b>	<b>\$ 125,845,011</b>	<b>\$ 61,813,363</b>	<b>\$ 56,094,475</b>	<b>\$ 53,931,699</b>	<b>\$ 56,845,743</b>	<b>\$ 56,379,146</b>	<b>\$ 53,398,142</b>	<b>\$ 705,935,886</b>

## 7.11 REVENUES AND TARIFF ISSUES

It has been widely recognised, since before the TA and institutional reform processes began, that there is a large gap between the revenues that are collected for water supply and sewerage services from customers and the cost of operating the services, even the costs as measured under the Government's cash-based accounting system which, as discussed, ignore large components of true costs such as depreciation. For example, in 2004, invoices issued for water and sewerage in all divisions totalled \$22.3 million<sup>19</sup>, of which \$15.7 million was collected in revenues, in a year when total costs measured by the Government accounting system were about \$46 million. Part of the gap is due to a poor rate of revenue collection against invoices, which in 2004 was about 70% nationally. The tariff review assumes that the revenue collection rate will improve to 95% by 2010 through reform of customer service and revenue collection procedures and will be maintained at that level thereafter.

### 7.11.1 The 'financial gap'

The true financial gap at the existing tariff, once all major cost items as discussed above have been included, is much higher than indicated by the Government accounts. Figure 7.23 shows projections of the operating revenues, operating expenditures and net losses of the WSD over the ten year period under an assumption that the current tariffs for WSD services are not changed, but all other assumptions regarding institutional reform and growth are maintained. This is done to demonstrate the full extent of the gap and how it is affected by future system growth.

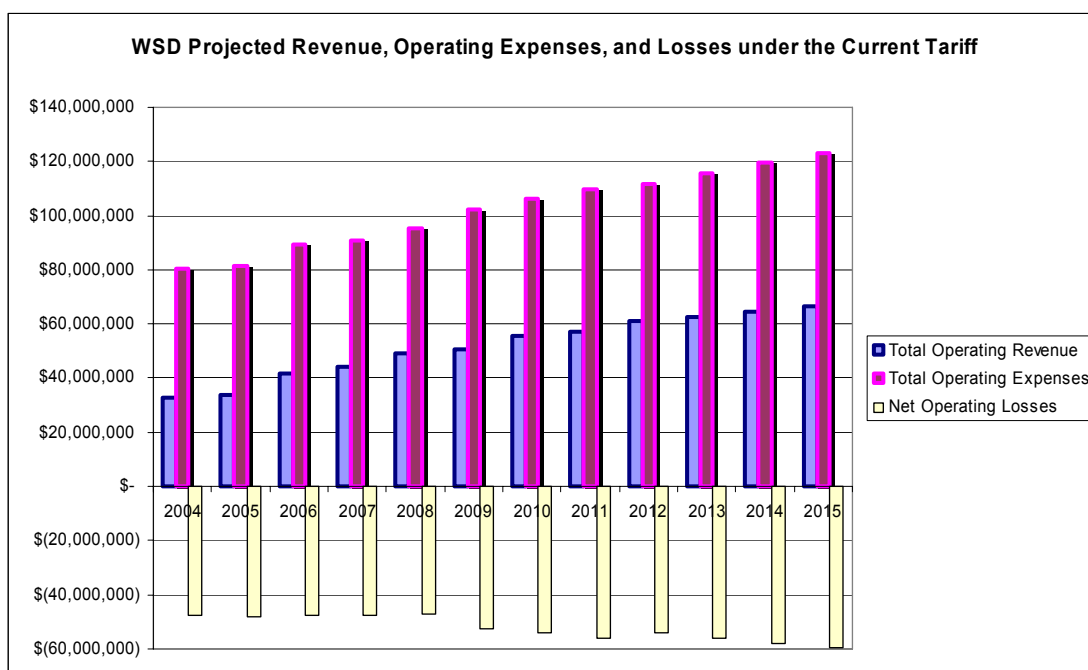
As indicated, net operating losses gradually increase as growth proceeds through the period and are cumulatively more than 100% of revenues, despite improvements in efficiency and reductions in unmetered consumption that are built into the assumptions on the cost side.

Depreciation charges as discussed above make up about 27% of operating expenses and account for about 46% of operating losses in 2005. When depreciation is deducted from operating costs, the result measures the 'cash costs' of operations, or 'operations, maintenance, and management' (OMM) costs, which include wages and salaries, inputs such as electricity, chemicals, and fuel, outside services and all other inputs for which cash must be paid to keep operations going. When OMM costs are used for expenditures instead of the full operating costs, the cash loss under the current tariff averages about \$24 million per year.

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<sup>19</sup> This figure represents an apparent considerable under-billing of metered consumption that year, as the true invoices for water and sewerage in 2004 based on reported volumes equate to a calculated \$33 million. The difference is partly explained by (i) rebates to consumers for on-premises leakages; and (ii) a legal allowance for an amount of 'social obligation' or free water consumed by churches, schools, and hospitals. The total volume of 'social obligation' water under present arrangements is not known but is estimated for present purposes at about 500 ML/year.





**Figure 7.23**  
**WSD projected revenue**

The gap shown here highlights two issues of immediate interest:

- Operations at the existing tariff cannot be sustained without an annual cash subsidy from the government of at least \$24 million per year and a further implicit subsidy of about \$22 million in 2005 rising to about \$35 million in 2015 to cover depreciation.
- There are no internal funds to generate cash reserves and support investment (or contingencies), resulting in a need to subsidise 100% of capital financing costs. It is instructive at this point to consider the scale of overall water supply tariff increase<sup>20</sup> that would be required to achieve OMM cost recovery 85% eliminating reliance on the government to sustain recurrent operations, but without generating cash reserves and 165% higher than cost tariff board. Full cost recovery, thus eliminating reliance on the government for recurrent operations, depreciation, and financing costs, and accumulating cash reserves.

Table 7.2 details the cost recovery scenarios.

<sup>20</sup> Assuming no adjustment to the sewerage charge, currently set as a surcharge of \$0.20 per cubic meter of water consumed.

**Table 7.2 Cost recovery scenarios**

	Current Tariff		OMM-Recovery Tariff			Full-Cost-Recovery Tariff		
	Tariff Levels	Weighted Average Tariff per m3	Required Percent Increase from Current Levels	Increased Tariff Levels	Weighted Average Tariff per m3	Required Percent Increase from Current Levels	Increased Tariff Levels	Weighted Average Tariff per m3
<b>Water Supply (per m3 per quarter)</b>								
<i>Domestic</i>		\$ 0.553			\$ 1.127			\$ 1.520
Basic Charge	\$ -		\$ -	\$ -		\$ -	\$ -	
0-50 m3	\$ 0.153		85%	\$ 0.283		165%	\$ 0.405	
51-100 m3	\$ 0.439		85%	\$ 0.812		165%	\$ 1.163	
>100 m3	\$ 0.838		85%	\$ 1.550		165%	\$ 2.221	
Water Connection Fee	\$ 21.95		85%	\$ 40.61		165%	\$ 58.17	
Water Re-Connection Fee	\$ 10.00		85%	\$ 18.50		165%	\$ 26.50	
<i>Commercial</i>		\$ 0.529			\$ 1.079			\$ 1.455
Basic Charge	\$ -		\$ -	\$ -		\$ -	\$ -	
All Usage m3	\$ 0.529		85%	\$ 0.979		165%	\$ 1.402	
Water Connection Fee	\$ 100.98		85%	\$ 186.81		165%	\$ 267.60	
Water Re-Connection Fee	\$ 10.00		85%	\$ 18.50		165%	\$ 26.50	
<i>Government</i>		\$ 0.529			\$ 1.079			\$ 1.455
Basic Charge	\$ -		\$ -	\$ -		\$ -	\$ -	
All Usage m3	\$ 0.529		85%	\$ 0.979		165%	\$ 1.402	
Water Connection Fee	\$ 100.98		85%	\$ 186.81		165%	\$ 267.60	
Water Re-Connection Fee	\$ 10.00		85%	\$ 18.50		165%	\$ 26.50	
<b>Sewer Service (per m3 water supplied per quarter)</b>								
<i>Domestic</i>		\$ 0.20			\$ 0.408			\$ 0.55
All Usage m3	\$ 0.200		0%	\$ 0.200		0%	\$ 0.200	
Sewer Connection Fee	\$ 15.25		0%	\$ 15.25		0%	\$ 15.25	
<i>Commercial</i>		\$ 0.20			\$ 0.408			\$ 0.55
All Usage m3	\$ 0.200		0%	\$ 0.200		0%	\$ 0.200	
Sewer Connection Fee	\$ 15.25		0%	\$ 15.25		0%	\$ 15.25	
<i>Government</i>		\$ 0.20			\$ 0.408			\$ 0.55
All Usage m3	\$ 0.200		0%	\$ 0.200		0%	\$ 0.200	
Sewer Connection Fee	\$ 15.25		0%	\$ 15.25		0%	\$ 15.25	
Net Profit/(Loss) in 2010	\$ (71,010,849) with depreciation \$ (36,644,901) without depreciation		\$ (33,124,307) with depreciation \$ 1,241,642 without depreciation			\$ 2,533,616 with depreciation \$ 36,899,565 without depreciation		
Cash Accumulation Greater than Zero from 2010?	No		Yes			Yes		

For illustrative purposes, typical monthly bills for domestic customers are calculated as shown below for different levels of consumption at the notional tariff levels shown in Table 7.3.

**Table 7.3 Typical monthly bills, domestic customers**

	Existing tariff	OMM recovery	Full cost recovery
25 m <sup>3</sup> per month	\$6.21	\$11.49	\$16.45
50 m <sup>3</sup> per month	\$23.83	\$44.09	\$63.16
100 m <sup>3</sup> per month	\$65.73	\$121.61	\$174.19
150 m <sup>3</sup> per month	\$107.63	\$199.12	\$285.23

The above tables are intended merely to show the estimated scale of the across the board tariff increases required to meet two types of financial objective and (broadly) their impact on domestic consumers' bills, based on the cost assumptions previously discussed. They do not reflect any consideration of how the tariff should be structured across different customer classes to meet socioeconomic objectives.

## 7.11.2 Proposed tariff setting considerations

### Poverty and willingness to pay

A customer survey and statistical analysis of customer willingness to pay for water was carried out as a Master's Thesis<sup>21</sup> in Lautoka, in early 2004. The survey by interview of 250 randomly-selected water supply customers sought information on each respondent's socioeconomic background, occupation, education level and other parameters and included, statistically quantifiable and testable questions indicating the respondents' degree of willingness to pay for water, under hypothetical increases in the quality and reliability of water supply service in the Lautoka area. Although the majority of respondents were low income, the study found a small but positive and significant willingness to pay more for water than the respondents pay at present, approximately 25% more than a bill based on the minimum-block rate. It was also found that expressed willingness to pay is highly constrained by a lack of credibility of the hypothetical improvements in supply that the respondents generally shared, no doubt borne of long experience with frequent and lengthy supply interruptions and the widely perceived ineffectiveness of the water supply department to address such problems.

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<sup>21</sup> Mirti, Anumitra V., *Estimating Lautoka (Fiji) Residents' Willingness to Pay for Improvement in Water Supply – (An Application of Contingent Valuation Method)*, Master's Thesis prepared for the Asia-Pacific School of Economics and Governance, Australian National University, June 2004.

The Lautoka study's results support the assumptions employed for present purposes that:

- there is a significant willingness to pay a higher tariff for water than the present tariff, in exchange for credible improvements in service quality and reliability
- that such willingness to pay will increase as real improvements in supply become effective and are recognised.

It is observed in this connection that the role of investment and institutional reform in the water supply and sewerage sector in reducing poverty in Fiji does not consist solely, or even mainly, in keeping rates to poor households as low as they are now (an average of F\$6.21 per month for consumption of 25 m<sup>3</sup> by a family of five). As has been documented elsewhere<sup>22</sup>, a prime indicator of poverty or 'hardship' in Fiji is deprivation of reliable access to basic services, including most importantly, a potable water supply. The chronically insufficient performance of the Government provider of the water supply in many urban areas in the past has contributed to hardship in those areas; alleviating such hardship through lasting improvements in supply will directly improve such indicators. As the above Lautoka study shows a small but significant willingness to pay for water in exchange for better supply, it supports the conclusion that poverty will be alleviated, in the view of poor households, even if monthly bills increase. To confirm this, it is recommended that additional willingness to pay studies be conducted in other urban areas of Fiji (including where reliability standards differ from Lautoka's), including an attempt to estimate the monetised costs that poor households face to secure alternative sources of water when the piped supply is interrupted, as an indicator of 'revealed' willingness to pay for a minimum reliable supply.

### **Proposed tariff structure criteria**

Under the cost assumptions discussed previously, the average cost of treating raw water and delivering a potable water supply to consumers in Fiji is approximately F\$1.50 per m<sup>3</sup>. Since all consumers pay rates that are well below the average cost of supply under the present tariff structure, *all* water supply consumers are effectively subsidised by funds from the Government's consolidated revenues, including even large businesses and industries, relatively well-off households and government consumers themselves. Given that there is no poverty-related justification for subsidising consumers who can afford to pay and that mis-targeted subsidies promote wasteful consumption (consumption that costs economic resources but provides little or no benefit), the current tariff is inefficient in the sense that it is ultimately leading the country to expend more resources on the water supply than the minimum necessary to provide the sector's aggregate economic benefit. A new tariff is therefore in order, one which focuses subsidy narrowly on the poor, but which ensures that all others pay rates that meet the costs of supplying them.

A survey of several urban communities that was conducted under the CEAP component of this TA found that wasteful consumption patterns are prevalent with

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<sup>22</sup> See, for example, *Priorities of the People: Hardship in Fiji*, ADB, 2005, and other country reports in the ADB's series on poverty in the Pacific.

little grassroots understanding of water issues or conservation benefits, even among poor households<sup>23</sup>. This indicates that the effect of a higher tariff on household budgets will be partly offset by reductions in wasteful consumption in all households. Also, as mentioned previously, there appears to be a high incidence throughout the country of illegal water supply connections<sup>24</sup> and the provision of rebates on customers' water bills for leakages on the customers' premises is a common WSD practice, thus reducing or removing incentive to track down and fix such leaks. Prior to and in conjunction with introducing a new tariff, therefore, it will be necessary to conduct an awareness campaign on water conservation and billing issues, eliminate the practice of rebating customers for after-the-meter leakages and track down all illegal connections and convert them to legitimate connections.

A number of basic 'structural' criteria for setting a new tariff for water supply and sewerage services in Fiji are proposed as follows:

- The tariff structure should be simple to administer and easy for customers to understand. In general, the new tariff structure should deviate from the current structure by the minimum necessary to achieve the WSD's financial goals and pro-poor objectives.
- No new tariff structure will make sense or have the desired efficiency effects without eliminating rebates and rigorously correcting all illegal connections, supported by an effective public awareness campaign.
- Non-poor consumers, which include commercial and industrial users, government users and non-poor households, should be charged a full cost recovery tariff for water supply.
- The present approach to cross-subsidising poor households, which relies on a 'rising block' structure under which an initial quantity of water consumed per period is charged at a lower rate than subsequent units, should be maintained, as it is simple to administer and is familiar to consumers. The initial block should, however, be sized to ensure that poor households are the main beneficiaries. Non-poor households habitually consume more water than poor households: the initial block should not exceed the basic needs of a poor household.
- The current quarterly billing cycle should be more frequent (monthly or even bimonthly is preferable) in order to reduce average bills. The less frequent the billing cycle the larger the bill, for a given level of monthly consumption and thus

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<sup>23</sup> *Community Consultative Survey, An Assessment of Need for Education and Awareness*, TA 4270-FIJ, April 2005. All things equal, the finding appears to indicate that, at the current tariff, water supply costs aren't particularly onerous even to the poor.

<sup>24</sup> It is likely that the average monthly consumption of a household with an illegal connection is higher than that of a same-size household with a legitimate connection, since the former pays nothing for the water, implying that much of the excess consumption is waste. (The tariff model at present assumes the consumption of an illegal connection is double that of a legitimate connection.) Therefore, converting illegal connections should have a rapid effect on reducing waste.

may eliminate the subsidy effect on poor households of the initial (subsidised) tariff block.

- A basic minimum charge per billing cycle (differing by customer category) is justified to defray overhead customer service costs which are incurred for each legitimate connection, even when consumption is very low or zero.
- The rate charged for sewerage can justifiably be cross-subsidised by the water supply tariff and/or externally subsidised, in view of the public-good environmental benefit of maximising the number of sewerage connections. The only exception to this criterion relates to large commercial, industrial, and Government producers of sewage ('trade waste' users) who should be charged the full cost of collecting and treating the wastes produced by their processes, as these costs are legitimately part of their output costs and need not be subsidised.

## **7.12 PROPOSED TARIFF (FOR REVIEW AND DISCUSSION)**

A tariff structure and level that meet the above criteria is outlined below. What follows should not be interpreted, however, as a tariff recommendation for the Water and Sewerage Department but rather as a demonstration of the implications of the foregoing cost analysis and discussion of tariff issues, to be used as a reference point for review and discussion as the reform process proceeds.

### **7.12.1 The minimum-rate block of domestic water consumption**

Average rural water consumption has been estimated at 160 litres/capita/day<sup>25</sup> and is less than the average urban water consumption for households (about 200 litres/capita/day) calculated within the tariff review model. The 160-litre figure is employed here as an indicator of a minimum necessity level of water consumption for a poor household. With an average urban household size<sup>26</sup> of approximately five in Fiji, average subsistence consumption per household is 800 litres per day, or about 25 m<sup>3</sup> per month. Therefore, adopting a bimonthly billing cycle, the minimum-rate block of 50 m<sup>3</sup> would be renewed every two months.

A 50% increase in the minimum block rate for domestic customers is proposed, i.e., from the current \$0.153/m<sup>3</sup> to \$0.23/m<sup>3</sup>. For a poor household maintaining consumption within the 25m<sup>3</sup>/month band, monthly costs would rise from the current \$6.21 per household (see Table 7.4) to \$7.75 per household, representing a total increase of about 25%. The total percentage increase in monthly bills is less than the percentage increase in the minimum block rate because the increase is partly ameliorated by switching to a bimonthly rather than quarterly billing cycle.

### **7.12.2 Proposed usage rates for domestic water consumption above the minimum block**

It is proposed that the two higher-consumption blocks for the domestic sector be maintained as they are (51–100 m<sup>3</sup>, and greater than 100 m<sup>3</sup>), but on a bimonthly

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<sup>25</sup> See reference in footnote 19.

<sup>26</sup> 1996 Census

rather than quarterly billing cycle. The rates for the next highest consumption block would be increased by 100% of its present level, i.e., from \$0.439/m<sup>3</sup> to \$0.878/m<sup>3</sup>, while the highest block would increase by the full recovery rate (165%), i.e., from \$0.838/m<sup>3</sup> to \$2.221/m<sup>3</sup>.

#### **7.12.3 Proposed usage rates for commercial and government water consumption**

The existing rates for all usage by these customer categories would be increased by 165%, from \$0.529/m<sup>3</sup> to \$1.402/m<sup>3</sup>.

#### **7.12.4 Water supply connection and re-connection fees**

Water supply connection fees should remain unchanged at \$21.95 and \$100.98 for the domestic and commercial/government categories, respectively.

Reconnection fees should increase by 100% in the domestic category from \$10.00 to \$20.00 and by 165% in the commercial/government category from \$10.00 to \$26.50 as an increased bill payment incentive.

#### **7.12.5 Basic charges for water supply**

Introduction of minimum basic charges per billing cycle is proposed to help defray fixed customer service costs. A minimum charge of \$4.00 per two month billing cycle is proposed for all households with a minimum charge for the commercial/government categories of \$20.00 on the same billing cycle. These charges would bring approximately \$5.1 million in fees to the WSD in 2008, rising to \$6.6 million by 2015.

#### **7.12.6 Charges for sewerage service**

It is proposed to leave sewerage charges including sewer connection fees unchanged from existing levels in order to promote wide acceptance of sewerage connections as the sewer systems are extended.

For reference, the above proposed tariff changes are summarised in Table 7.4.

These tariff changes, under all of the cost, institutional reform and customer and system growth assumptions as discussed previously, would recover the full costs of the water supply and sewerage sector beginning in 2010 (the assumed date of implementation of the new tariff). The financial performance of the WSD under these conditions is shown in the detailed model tables presented in the Volume 7 – Appendix.

**Table 7.4 Proposed tariff changes (for discussion)**

	Current Tariff (2004/05)	National Uniform Tariff Scenarios				
		Weighted Average Tariff per m3 in 2004	Year of Adjustment	Tariff after Adjustment	Weighted Average Tariff per m3 in year of Implementation	Percent Increase in Weighted Average Tariff
			Tariff Level (\$) or Increase (%)			
<b>Water Supply (per m3 billed every two months)</b>						
<i>Domestic</i>		\$ 0.56	2010		\$ 1.37	146.66%
Basic Charge per period	\$ -		\$ 4.00	\$ 4.00		
0-50 m3	\$ 0.153		50%	\$ 0.230		
51-100 m3	\$ 0.439		100%	\$ 0.878		
>100 m3	\$ 0.838		165%	\$ 2.221		
Water Connection Fee	\$ 21.95		0%	\$ 21.95		
Water Re-Connection Fee	\$ 10.00		100%	\$ 20.00		
<i>Commercial</i>		\$ 0.48	2010		\$ 1.38	188.66%
Basic Charge	\$ -		\$ 20.00	\$ 20.00		
All Usage m3	\$ 0.529		165%	\$ 1.402		
Water Connection Fee	\$ 100.98		0%	\$ 100.98		
Water Re-Connection Fee	\$ 10.00		165%	\$ 26.50		
<i>Government</i>		\$ 0.53	2010		\$ 1.46	175.43%
Basic Charge	\$ -		\$ 20.00	\$ 20.00		
All Usage m3	\$ 0.529		165%	\$ 1.402		
Water Connection Fee	\$ 100.98		0%	\$ 100.98		
Water Re-Connection Fee	\$ 10.00		165%	\$ 26.50		
<b>Sewer Service (per m3 water supplied per quarter)</b>						
<i>Domestic</i>		\$ 0.25	2010		\$ 0.25	0.00%
All Usage m3	\$ 0.200		0%	\$ 0.200		
Sewer Connection Fee	\$ 15.25		0%	\$ 15.25		
<i>Commercial</i>		\$ 0.25	2010		\$ 0.25	0.00%
All Usage m3	\$ 0.200		0%	\$ 0.200		
Sewer Connection Fee	\$ 15.25		0%	\$ 15.25		
<i>Government</i>		\$ 0.25	2010		\$ 0.25	0.00%
All Usage m3	\$ 0.200		0%	\$ 0.200		
Sewer Connection Fee	\$ 15.25		0%	\$ 15.25		