

## **CHAPTER 2 – PLANNING REQUIREMENTS**

### **2.1 Introduction**

The WRMP is designed to address a range of planning requirements and constraints. The Stipulated Order is a basic legal requirement that must be met. A successful master plan must also address resource constraints (personnel, financial and material) and provide a program that is affordable and sustainable. Additionally, the WRMP must address other requirements, such as environmental regulations and, in the case of GWA, should consider governance and privatization issues.

### **2.2 Stipulated Order**

GWA entered into a Stipulated Order with EPA Region IX on June 5, 2003; a copy is provided in Appendix 1B. The Stipulated Order was deemed the appropriate way to require immediate implementation of short-term projects and initial planning measures needed to address compliance issues for GWA's water and wastewater utility systems. The first priority of the Stipulated Order is to address potential threats to public health and safety in Guam. The second priority is to set intermediate, achievable goals, such as coming into compliance with relevant health, environmental, and safety regulations. EPA's intent is to use the WRMP to establish a timetable for future capital improvements.

The Stipulated Order is divided into 13 sections and includes 74 paragraphs within those sections. The key sections and associated paragraphs that could be related to the WRMP are listed in Table 2-1.

**Table 2-1 – Key Stipulated Order Requirements for WRMP**

Section	Title	Paragraphs
II	Management and Organizational Structure of GWA	3 to 9
III	Operations at GWA	10 to 25
IV	Financial Administration at GWA	26 to 34
V	Construction and Rehabilitation Projects at GWA	35 to 45
VI	Training at GWA	46 to 47

The WRMP requirements are specifically described in Section III, Paragraph 10 and are summarized below:

- Comprehensive analysis of wastewater collection, treatment, and disposal/reuse improvement alternatives and needs for the next 20 years, including:
  - Infiltration and inflow assessment of GWA's collection system sufficient to identify and prioritize problem areas.
  - Additional assessments of the following:
    - Septic systems hookup needs and alternatives
    - Decentralized treatment systems
    - Potential consolidation with U.S. military systems
    - Biosolids management and reuse
    - Analysis of costs and other impacts

- Comprehensive analysis of water system improvement alternatives and needs for the next 20 years, including:
  - Disinfection
  - System pressure
  - Water resources (surface and groundwater)
  - Treatment needs (including groundwater under direct influence of surface water)
  - Transmission and distribution system improvements
  - Additional assessments for the following:
    - Potential consolidation with U.S. military systems
    - Water reuse
- Comprehensive analysis of the costs and benefits of water conservation
- Evaluation of necessary process control improvements including Supervisory Control and Data Acquisition (SCADA), information management systems, telemetry, and automation
- Financial Plan that includes details on revenue generation and a user fee system that complies with Public Utilities Commission requirements
- Detailed five-year plan for financing that includes the following components for the water and wastewater systems :
  - Costs for operation, maintenance and repairs
  - Estimated annual budget for next five years including Financial Reserves
  - Plan for raising sufficient revenue to meet following anticipated additional costs:
    - Stipulated Order compliance activities
    - Clean Water Act and Safe Drinking Water Act compliance requirements
    - Infrastructure improvements recommended by the WRMP

The Stipulated Order identifies seven planning tasks that must be completed within a specified time:

**Table 2-2 – Stipulated Order Milestones**

Task	Time from Start, days
Leak Detection Study	180
Estimated Water Budget	240
GIS Layers (basic information)	270
Hydraulic Analysis	365
GIS Layers (additional information)	540
Draft Master Plan	540
Final Master Plan	630

The WRMP scope of work described in Volume 1, Chapter 1 – Background, addresses the Stipulated Order requirements. The detailed scope of work is divided into eight major tasks and is described in detail in Appendix 1A.

## **2.3 Resource Constraints**

Resource constraints for GWA can be divided into three categories: personnel, financial, and material. Specifics relating to these constraints are presented in the following subsections.

### **2.3.1 Personnel Constraints**

Constraints relating to personnel are demonstrated by the lack of certified personnel in Guam, thereby requiring administrators to recruit operations personnel from the mainland U.S. Insufficient availability of qualified instructors has also been the reason to import trainers from off-island locations. In addition, the lack of sufficient technical and managerial support and trained personnel for operation and maintenance of both the water and wastewater systems has been a key cause of violations of regulatory requirements. Over the course of the planning period, a number of improvements were made including both provision of training opportunities and hiring of certified personnel in both water and wastewater sectors. Overall, the number of personnel for the size of GWA's system is on par with other comparable utilities. The major constraints are on the level of expertise commensurate with the job requirements. Again this challenge is being met by the addition of and training on systems introduced by the WRMP consulting team, which include upgrading the GIS system, location and logging of water and wastewater component locations, and establishing models to improve efficiency of personnel. Suggestions for addressing personnel constraints are contained in Volume 1, Chapter 3 – Organization Assessment.

### **2.3.2 Financial Constraints**

The ability of GWA to move ahead with needed capital improvements has been hampered by several factors. Several examples are cited below, although some of these situations have since been partially rectified:

- Uncollected water and sewer bills.
- Deferred spending for facility repairs, resulting in excessive costs for emergency situations.
- Failure to maintain a stock of critical repair parts, resulting in excessive costs in emergencies.
- Failure to meet regulatory requirements, resulting in payment of penalties and reducing the amount of capital that could have been more productively spent on facilities.
- Administration practices that have reduced the ability to obtain favorable bond ratings.

Repair and replacement of essential equipment and structures for both the water and wastewater systems will require significant capital outlays in the future. In 2005, GWA was able to secure the Series 2005 Bond issue for \$104 million dollars in financing to begin addressing some of the utility system's capital needs. Volume 1, Chapter 14 – Financial Program, addresses financial constraints and issues in detail.

### **2.3.3 Material Constraints**

An example of this type of constraint is the existing island-wide groundwater extraction rate—approximately 40 mgd—compared with the aquifer's sustainable yield, which may be in the

range of 50 to 60 mgd. Consequently, groundwater availability must be considered when balancing future drinking water needs with water resource management options. (See Volume 2, Chapter 3 – Water Budget, for more detail on water resource constraints.)

Another factor is that a significant portion of the infrastructure is either severely impaired or inoperable, the result of deferred maintenance. (See Volume 2, Chapter 7 and Volume 3, Chapter 3 for respective condition assessments of the water and wastewater systems.) Some progress has been made in upgrading water system well reliability by improving power quality and installing protective devices to prevent outages. Purchase of a crane truck enables GWA maintenance crews to move equipment on their own rather than rent expensive lifting equipment. These actions are commendable but are just a beginning of the actions needed to achieve a well-functioning utility.

#### **2.3.4 Summary**

The above presentation of resource constraints is by no means exhaustive. Many of the immediate needs for facility and personnel improvements are being addressed by the WRMP, and solutions to all aspects will be recommended. Ultimately, GWA's administration will be responsible for acting on the recommendations and obtaining the financing to complete them.

### **2.4 Preliminary Assessment of Affordability**

Affordability is an important socioeconomic issue. To address this issue, a preliminary assessment was conducted to provide some measure of the level of investment that could be afforded by users based on current income. The complete preliminary assessment is included in Appendix 1C. The major conclusions of that assessment are included below.

At the present time, average household income on the island is about \$50,000 per year, according to the Guam Annual Economic Review 2000-01 published by the Bureau of Statistics and Plans. This figure is the starting point for looking at the affordability of future water and wastewater improvement works. Utility rates can also affect the local economy on a broader scale. Well-planned and well-managed water and wastewater infrastructure can greatly assist in improving the economy if it is implemented in an affordable way.

Water and wastewater charges are affected by changes in current and future costs. GWA is currently in the process of significantly improving its performance. However, some decisions that would lead to a more efficient organization are beyond the control of management. For example, new laws are required to enable the organization to act more efficiently. There is also a process under way to privatize GWA's operations, which may have financial impacts on future costs. It is not possible to estimate these costs until the actual form of the contract and its associated arrangements are detailed by the privatization consultants. Consequently, such impacts are not included in this preliminary analysis of affordability.

#### **2.4.1 Financial Situation and Master Plan Implications**

GWA's financial situation deteriorated markedly during the 1990s, and the 1998 and 1999 audited financial statements recorded significant operating deficits. Also, natural disasters destroyed many assets during this decade, and the level of service deteriorated. Remaining assets were poorly operated and maintained.

New management appointed in the last few years has turned around GWA's financial situation, going from budget deficits to a point where the 2004 budget predicted no deficit.

In 2004, GWA developed a Five-Year Financial Projection for the future CIP projects required to meet EPA obligations. Both positive and negative uncertainties are associated with the financial projection estimates. On balance, these uncertainties are probably less than those facing GWA in a broader sense, such as the major uncertainties relating to future changes in law affecting GWA's autonomy and efficiency of operations, the procurement methods that are to be used for major upgrading projects, and even possible privatization of GWA. Consequently, the Five-Year Financial Projection is considered the best set of data available at this time on which to base some broad affordability calculations.

#### **2.4.2 Affordability and Rate Increases**

Many articles and publications in the early 1990s discussed affordability of water charges and related matters. Examples are "The Poor and the Elderly – Drowning in the High Cost of Water" (National Consumer Law Center, 1991) and "EPA Affordability of the 1986 SDWA Amendments" (EPA, 1993). These articles did not prove that there was a single affordability benchmark, but there was convergence on two percent of household income as a marker for affordability. A more recent presentation by Steve Allbee titled "Public Spending on Water and Wastewater" (EPA, Washington, DC, March 2000) refers to the two percent benchmark figure on affordability. The figure is a reference marker rather than an absolute benchmark for the affordability of water charges.

Affordability is a complex socioeconomic issue, and each state or governmental entity has to set up its own criteria and make its own judgments on the issue. The affordability marker of two percent is a small part of most household budgets, but poorer households are generally more affected by affordability issues. Based on the current Five-Year Financial Projections and planned rate increases, the CIP projects outlined in the Stipulated Order appear affordable as the combined water and wastewater bills will be just under two percent of median household income. However, it is estimated that about 25% of households on Guam have combined utility bills totaling over four percent of their household income, and further rate rises will affect them most.

There is still opportunity to increase rates to pay for more CIP projects required by the WRMP and yet stay below the affordability marker of two percent. However, the amount of extra expenditure is relatively modest at about \$60 to \$120 million before the two percent level is reached. Above this level, far more attention needs to be paid to the distributional aspects of water rating.

The current lifeline rate is one way of assisting poorer households to afford water. Lifeline rates aim to provide the basic amount of water required for living at a reduced price. In 2004, the lifeline rate was \$2.40 per 1,000 gallons for the first 5,000 gallons of usage. After that, the water price increased to \$3.15 per 1,000 gallons.

The current lifeline rate is inefficient because it targets low-water use households rather than low-income households. For example, a rich household with a married couple and no children receives the same benefit from the current lifeline rate as a poor household with many children. The efficiency of the lifeline rate as a policy instrument to assist the poor would be improved if there was an income test for households before the rate was given. This approach would entail extra administrative costs, which would have to be weighed up against the efficiency gains.

If improvements are made to this arrangement, or assistance is provided by other means, affordability should not become a major public issue even with the higher expenditures that may result from the WRMP. (Note: Volume 1, Chapter 14 – Financial Program, provides additional detail on the issue of lifeline rates in Section 14.9 and the issue of affordability in Section 14.10.)

## **2.5 Other Requirements**

The WRMP findings and conclusions are assisting GWA in identifying other requirements, constraints, and drivers that need to be considered in the evaluation and development of planning alternatives. For example, proposed organizational changes or processes may affect the conditions of the Stipulated Order. Specific items either encountered to date or of potential consequence in the future are addressed in the following subsections.

### **2.5.1 GWA Governance**

The appointment of a General Manager for the consolidated water, wastewater, and power utilities over the GWA General Manager position has introduced some uncertainty in the administrative goals of the GWA. The move ties GWA closer to Guam Power Authority (GPA); however, the effect on GWA's mission is unclear. Some organizational and/or operational streamlining may occur by combining similar functions, but the potential also exists for diverting attention from the need to meet the requirements of the Stipulated Order.

### **2.5.2 Privatization**

Essentially from the initiation of the master planning process, the issue of privatization has been considered and debated. The three primary privatization options considered include contract operations, concession agreement, and divestiture. The Consolidated Commission on Utilities (CCU) is currently considering the use of Performance Management Contracts to provide outside management and support of selected water and wastewater facilities. The prospect of total or partial privatization contributes to uncertainty at all levels of the organization, but does nothing to discount the need to continue the WRMP process. The same needs will exist regardless of the type of administration. Volume 1, Chapter 16 – Privatization/Consolidation Opportunities discusses the privatization issue in greater depth.

### **2.5.3 Changing Environmental Regulations**

Every utility responsible for a water or wastewater operation is constantly faced with future regulation modifications or additions. The principal focus of the WRMP is on water and wastewater regulations derived from the Safe Drinking Water Act, Clean Water Act, and Guam EPA rules and regulations. Specific applications to GWA are addressed in Volume 2, Chapter 2 – Water Regulatory Issues, for water and Volume 3, Chapter 2 – Wastewater Regulatory Issues, for wastewater. Specific areas that may have an impact on GWA are listed below:

- The potential designation of specific groundwater resources as being “under the influence” of surface water and surface activities.
- Upcoming regulatory agency groundwater operations and management rules, such as the Groundwater Rule and changes to the Total Coliform Rule.
- Upcoming amendments to the Surface Water Treatment Rule including:
  - Tightened turbidity performance criteria

- Individual filter monitoring requirements designed to optimize treatment reliability enhancing physical removal efficiencies that minimize Cryptosporidium levels in finished water
- Rule changes to include disinfection profiling and benchmarking provisions to ensure continued levels of microbial protection
- EPA’s Sanitary Sewer Overflow (SSO) Policy and pending regulations on Capacity, Management, Operation, and Maintenance (CMOM) requirements
- Projected future status of GWA’s National Pollutant Discharge Elimination System Permits
- Potential Secondary Treatment Discharge Waivers

## **2.6 Conclusions**

The Stipulated Order with EPA Region IX dated June 5, 2003 has driven much of the planning activities. Several constraints to successful utility administration and operation identified in the plan are summarized below:

- Constraints relating to personnel are demonstrated by the lack of certified personnel in Guam, thereby requiring administrators to recruit operations personnel from the mainland U.S.
- Financial constraints are evident because funds for repair and replacement of essential equipment and structures for both the water and wastewater systems have been hampered by lack of sufficient capital outlays.
- Material constraints are evidenced by a significant portion of the infrastructure that is either severely impaired or inoperable as a result of deferred maintenance.
- Coincident with the challenges of financing a 20-year CIP, is the factor of affordability, which is addressed in the WRMP.
- Other factors considered in the plan include the impact of GWA governance, potential privatization plans, and unknown or pending regulatory requirements.

## **2.7 Recommendations**

Subsequent chapters of the WRMP present recommendations for issues presented in this chapter.

## **2.8 CIP Impacts**

There are no specific CIP impacts specifically addressed in this chapter; subsequent chapters particularly in Volumes 2 and 3 present CIP impact figures and Volume 1, Chapter 15 – Capital Improvements Program, summarizes the entire plan topic.