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“Water is a Resource of Intergenerational Equity and challenges all of us that scarcity of this resource today and in the future will dramatically widen the gap even more between the rich and the poor; the developed and the under-developed.”

_Edith Brown Weiss_

Edith Brown Weiss is a Law Professor at Georgetown University, teaching international law on water resources and environment. She is a prominent personality in international environmental law and has received numerous awards and citations for her work.
The Administrator’s Story on Water Security...

Water Security has a soul. It is neither a concept nor a slogan. It is a call to solid action. Just as it is infrastructure, so too is it policy. But more, much more than all that, it is passion to keep balance an intergenerational resource basic to man.

MWSS is central to Water Security in Mega Manila. It desperately tries to keep that balance, that delicate life-equilibrium that can only be achieved with heart. Agencies must not only understand but also embrace the basic truth that such imbalance fundamentally “widens the gap even more between the rich and the poor, the developed and the underdeveloped.”

Core to Water Security is environment; the reality of climate change; the impact of MWSS’ implementation or non-implementation of infrastructure; in-depth review and updating of policies and simulations used for decades; technology and methods; the synergy of agencies, both private and public. The gain must always be felt. The gain must always be fair. The gain of Water Security must benefit all.

The path to these words is not easy. Such path must be fueled to some extent, with advocacy and obsession; a delirious desire to keep that balance. The call to action can only be won through war. A battle against bureaucracy, turf, complex laws and rules that go nowhere, private gain, organizational collapse, inaction and ignorance, and the other evils that deprive a life resource to man.

This journey must be shared. This story must continue. This legacy must be its own equity.

Gerardo A.I. Esquivel
About This Report

This Term Report speaks of MWSS’ modest gains and initiatives from year 2011 up to the first half of 2016.

Be clear, that the crafting of the Water Security Legacy Plan initiated all the other programs of MWSS. The spirit and soul of this plan is to regain the government’s role in being the true guardian of water security for Metro Manila. Government through MWSS must not entirely delegate its prime function and mandate to oversee the water concerns of its service area.

The plan pieced together the existing programs and the new initiatives and molded them into a comprehensive set of major legacies under seven (7) focus areas.

Sustaining The Water Security Legacy Plan became a continuing challenge over the years.

This report highlights years of various workgroups, policy development with external stakeholders, government approvals, interfacing with LGUs and other major players to make operational the Water Security Legacy program. This report will also show how multi-faceted and complex water infrastructure can be and how implementation can be paralyzed in spite of the volumes of studies prepared for decades.

2011 and 2012 were dedicated to research, feasibility studies, and government approvals. These years also introduced MWSS to deep discussions with major funding sources like ADB, the PPP center and the 2 Concessionaires.

In 2013, the MWSS Regulatory Office conducted its rate rebasing exercise with the concessionaires. This process, after months of audit and review resulted in MWSS’ decision for a rate reduction of the two concessionaires. This decision was a first in the history of MWSS. The agency likewise, remained firm in their resolution that corporate income tax is not a recoverable expense. This decision resulted in the filing of separate dispute notices by the two concessionaires.

2014 saw the bidding process of the three flagship infrastructure projects set in full speed. The New Centennial Water Source-Kaliwa Dam Project (NCWSP-KDP) and the Angat Water Transmission Improvement Project (AWTIP) finally got their respective NEDA Board approvals. The pre-qualification documents for the Bulacan Bulk Water Supply Project were completed, approved, and disseminated.

In 2015, the Notice of Award was finally issued to the winning bidder San Miguel – Korea Water consortium for the Bulacan Bulk Water and Supply Project. For the AWTIP, eight bidders submitted their pre-qualification bids to MWSS, which were submitted to the Asian Development Bank (ADB) for bid evaluation. The strengthening of Angat Dam and Dyke commenced this year together with the finalized funding source for its instrumentation and downstream improvements.

In current year 2016, MWSS awarded the AWTIP to winning bidder CMC Ravenna Cooperativa (CMC-RC) of Italy. For the BBWSP, the Concession Agreement and the MOAs with the water districts were signed on 15 January. MWSS also broke ground with the CMC-RC.

Third quarter of this year, MWSS will release the bid documents to two pre-qualified bidders. The target award will be last month of 2016 or first quarter of 2017. Just in time for the demand-supply study projections of Metro Manila.

While the remaining initiatives related to finance, governance, and other key bubbles are incorporated in this report, MWSS’ believes that its major contribution to the consuming public is the availability and reliability of potable water through implemented infrastructure.

Transformation from a conservative agency to being a professional overseer and principal guardian of Water Security has begun. The years ahead will forge MWSS to be a world class agency admired for its technically competent infrastructure.
History of MWSS

On 19 June 1971, Republic Act 6234 was enacted. It dissolved the National Waterworks and Sewerage System (NAWASA) and created in its place the Metropolitan Waterworks and Sewerage System (MWSS). MWSS was thus given the mandate to ensure an uninterrupted and adequate supply and distribution of potable water at just and equitable rates. The proper operation and maintenance of sewerage systems is likewise part of its mandate.

As a result of the National Water Crisis Act of 1995, in 1997, the operation of the MWSS was privatized through public bidding after government realized that the private sector is better suited to continue its operations. Manila Water Corporation, Inc. and Maynilad Water Services Inc. separately won the bid for an initial 25-year concession period which was later extended to another 15 years.

Republic Act No. 6234 or the MWSS Charter

MWSS was created under Republic Act 6234, which was approved on 19 June 1971. Its main objective is to ensure an uninterrupted and adequate supply and distribution of potable water for domestic and other purposes to its consumers at just and equitable rates. It also aims to provide sewerage and sanitation services to the public. MWSS owns and has jurisdiction over all waterworks and sewerage system of all the cities and municipalities of Metro Manila, and some municipalities of Cavite, Rizal and Bulacan.

These are the major powers and functions of MWSS in the Republic Act No. 6234.

- To construct, maintain, and operate dams, reservoirs, conduits, aqueducts, tunnels, purification plants, water mains, pipes, fire hydrants, pumping stations, machineries and other waterworks for the purpose of supplying water to the inhabitants of its territory, for domestic and other purposes; and to purify, regulate and control the use, as well as prevent the wastage of water;

- To construct, maintain, and operate such sanitary sewerages as may be necessary for the proper sanitation and other uses of the cities and towns comprising the System;

- To fix periodically water rates and sewerage service fees as the System may deem just and equitable in accordance with the standards outlined in Section 12 of this Act;

- To construct, develop, maintain and operate such artesian wells and springs as may be needed in its operation within its territory;

- To acquire, purchase, hold, transfer, sell, lease, rent, mortgage, encumber, and otherwise dispose of real and personal property, including rights and franchises, consistent with the purpose for which the System is created and reasonably required for the transaction of the lawful business of the same;

To approve, regulate, and supervise the establishment, operation and maintenance of waterworks and deep wells within its jurisdiction operated for commercial, industrial and governmental purposes and to fix just and equitable rates or fees that may be charged to customers thereof;
Republic Act No. 8041 or The Water Crisis Act

Republic Act No. 8041 or the National Water Crisis Act of 1995 was promulgated to adopt urgent and effective measures to address the nationwide water crisis which adversely affected the health and well-being of population, food production and industrialization process.

The Act paved the way for the privatization of MWSS operations through Executive Order No. 311. The main reasons for privatization are the following:

- **Poor Coverage** - MWSS was able to supply water to only 69% of its service area.
- **Inefficient Service** - Water availability was intermittent, averaging only 16 hours per day, and water pressure was uncomfortably low.
- **Highest Non-Revenue Water (NRW) in Asia** - NRW of MWSS at the time was nearly twice that of developed countries. NRW refers to the unbilled or lost portion of water produced or supplied. This is caused mainly by meter tampering, illegal connections, pipeline leaks, and the illegal use of fire hydrants.
- **Low Sewerage Coverage** - Approximately only 8% of the total service population and less than 7% of households in the service area were covered. Sewerage facilities could be found only in some areas in Manila and Makati, with most establishments having to use either their own or communal septic tanks.
- **Tedious Procurement Procedures** - Procurement procedures tended to be very rigid and involved many sequential processes. This oftentimes resulted in inefficiency and delays, both in terms of acquisition of equipment and in the implementation of projects.

In essence, privatization aimed to transfer financial burden to the private sector, improve service standards, increase operational efficiency and minimize tariff impact.
The Water Trail

The Angat Dam/Reservoir is the main water source for the people of Mega Manila. The Angat Watershed provides the bulk of the water to the Angat Reservoir. The waters from the Umiray River provide additional water to Angat Dam through the Umiray-Angat Transbasin Tunnel (UATT). Conveyance is done basically by gravity from the source, into the plant and out into the distribution system.

From Angat, water is funneled directly to Ipo Dam. It then flows a distance of 6.4 kilometers to the three basins in Bicti. The basins control the water flowing from it to the six aqueducts each about 16 kilometers long all going to the La Mesa Dam through the La Mesa Portal.

From La Mesa Portal, 60% of the water goes to the nearby La Mesa Treatment Plants while 40% travels down a distance of 6.8 kilometers to the Balara Treatment Plant.

The Balara and La Mesa Treatment Plants process water from its raw state to clean and potable water through a series of screening and cleansing process. The Balara Treatment Plant has a full production capacity of 1,600 mld and supplies more than six million people throughout the metropolis. The La Mesa Water Treatment Plant processes 2,400 mld of raw water.

Both plants were built with least cost technological package as they have very minimal electromechanical equipment and rely mostly on hydraulic properties of water to backwash their filters.

When both Balara and La Mesa Treatment Plants are in operation, the total processing capacity is about 4,000 mld. The La Mesa Water Treatment Plant serves the West Zone of the concession area (Maynilad concession), while the Balara Water Treatment Plant supplies the East Zone of the concession area (Manila Water concession).
La Mesa Dam

- Erected in 1929 & then raised in 1959
- Annual average rainfall of about 2,000 millimetres
- Spilling level at 80.15 meters
- Storage Capacity of 38 million cubic meters
- Watershed with an area of 27 square kilometres or 2,700 has
- Located in Novaliches, Quezon City

Umiray Diversion Dam

- Annual average rainfall of about 2,000 millimetres
- Spilling level at 80.15 meters
- Storage Capacity of 38 million cubic meters
- Watershed with an area of 27 square kilometres or 2,700 has
- Located in Novaliches, Quezon City

Angat Dam

- Constructed from 1964 to 1967
- Operationalized since 1968
- Annual average rainfall of about 4,200 millimetres
- Spilling level at 210 to 217 meters
- Storage capacity of 850 million cubic meters
- Watershed with an area of 620 square kilometres or 62,000 has
- Located in Norzagaray, Bulacan

Ipo Dam

- Completed in January 1984
- Annual average rainfall of about 3,500 millimetres
- Spilling level at 101 meters
- Storage Capacity of 5.9 million cubic meters
- Watershed with an area of 70 square kilometres or 7,000 has
- Has 7 radial flood gates
- Located in Bgy. San Mateo, Norzagaray, Bulacan

La Mesa Dam

- Erected in 1929 & then raised in 1959
- Annual average rainfall of about 2,000 millimetres
- Spilling level at 80.15 meters
- Storage Capacity of 38 million cubic meters
- Watershed with an area of 27 square kilometres or 2,700 has
- Located in Novaliches, Quezon City
MWSS Board of Trustees

Gerardo A. I. Esquivel (2011 to present) obtained his Bachelor of Science Degree in Architecture in 1982 from the University of the Philippines in Diliman and passed the Board Licensure Exam in 1984. He spent three years of secondary education at the Ateneo de Manila High School and graduated at Lincoln-Sudbury Regional High School in Massachusetts. He finished his primary education in Ateneo de Manila Grade School.

He is the Founding Chairman of ASEC Development & Construction Corporation, ASEC Land Incorporated, The Regalia Group Corporation, Ignajo Foundation, Incorporated, and Founding Trustee of AGAPP Foundation.

Ireneo M. Galicia (2015 to present) obtained his Bachelor of Laws from Ateneo de Manila University in 1978 and Bachelor of Arts in Political Science from the University of the East in 1972 and admitted to the Practice of Law in the State of California in 1989.

Helena Agnes S. Valderrama (2014 to present) obtained her PhD (Business Administration) in 2006 from University of the Philippines, MA Technology Policy & Management in 1994 from University of Wollongong, NSW, Australia and Bachelor of Science in Business Administration and Accountancy (Cum Laude) in 1988 from the University of the Philippines.

Benjamin C. Yambao (2011 to present) obtained his Masters in Business Administration (Academic Units only) from De La Salle University in 1975 and Bachelor in Accountancy from the University of the East in 1966. He was formerly the President of the Manila Banking Corporation.

Rev. Fr. Jose Ramon T. Villarin, SJ (2011 to present) obtained his PhD in Atmospheric Sciences from Georgia Institute of Technology in Atlanta, USA in 1997 and Master’s Degree in Physics from Marquette University in Wisconsin, USA in 1987. He graduated Valedictorian with a Degree in Physics from the Ateneo de Manila University. He is presently the President of the Ateneo de Manila University.

Ma. Cecilia G. Soriano (2011 to present) obtained her PhD in Economics from the University of California at Berkeley. She graduated Valedictorian and Magna cum Laude from the Ateneo de Manila University in 1979 with a B.S. in Management Engineering.

Olivia La’O Castillo (2015 to present) obtained her PhD in Business Administration from the University of the Philippines in 1997, Master of Business Administration in the same university in 1975 and Business Administration, Major in Social Studies in Maryknoll College in 1967.
Previous MWSS Board of Trustees

Ramon Alikpala  (2010 to 2013) obtained his Masters Degree in Business Administration major in Finance from Fordham University and Bachelor of Science in Business Economics from the University of the Philippines. He was appointed as Financial Regulator of the MWSS Regulatory Office in 2002 and Executive Director of the National Water Resources Board in 2003. He is currently connected with the USAID Be Secure Project as Senior Technical Adviser.

Raoul C. Creencia  (2011 to 2015) obtained his Diploma in Law from the University of Sydney, Australia and Bachelor of Laws from San Beda College, Manila and admitted to the Philippine Bar in 1994. He finished Bachelor of Arts, Major in Political Science from the University of Santo Tomas. He is currently connected with the Department of Transportation.

Emmanuel L. Caparas  (2011 to 2015) obtained his Bachelor of Laws from the University of the Philippines in 1985 and admitted to the Philippine Bar in 1986 and Bachelor of Arts in Economics in the same university in 1981. He finished his High School and Elementary from Ateneo de Manila University in 1977 and 1973, respectively. He was formerly Acting Secretary of Justice. He also was connected with the Supreme Court before his stint with MWSS.

Hermogenes R. Fernando  (2011 to 2013) obtained his Masters Degree in Business Administration from De La Salle University and Bachelor of Science in Chemical Engineering in the same university. He also took up Advanced Management Program from Harvard Business School. He finished First Honor in High School from San Beda College and Salutatorian in Elementary from Baliwag Elementary School. He was formerly the General Manager of Intel Philippines.
The Corporate Office

After privatization, MWSS has been doing the following functions through the MWSS Corporate Office:

- Seeking additional water sources and construction or rehabilitation of upstream tunnels and aqueducts
- Facilitating the exercise by the concessionaires of its agency powers
- Managing and disposing of retained assets
- Monitoring, reporting, and administering loans and performing related functions in connection with existing projects
- Carrying out accounting and notification functions
- Managing and operating the Umiray-Angat Transbasin Project
The Regulatory Office

The MWSS Regulatory Office (RO) was created in August 1997 by virtue of the Concession Agreements between MWSS and the two concessionaires Manila Water and Maynilad.

It is primarily mandated to implement the provisions of the Concession Agreement as follows:

- Reviews, monitors and enforces rates and service standards;
- Arranges and reports regular independent audits of the performance of the Concessionaires; and
- Monitors the infrastructure assets.
MWSS Concession Areas

North Zone
- Bulacan

East Zone
- Quezon City
- Rizal

West Zone
- Manila
- Cavite

2016

1997
MWSS Concessionaires

Manila Water Company Inc. (MWCI)
The MWCI is MWSS’ concessionaire for the East Zone of MWSS’ service area. It is a joint venture between Ayala Corporation and two foreign companies, the United Utilities of the United Kingdom and the Mitsubishi Corporation of Japan. The employees of Manila Water own six percent of the company stocks through its Employees’ Stocks Option Program.

Its franchise area includes Mandaluyong, Marikina, Pasig, Pateros, San Juan, Taguig, Makati and parts of Quezon City and Manila. It also services Antipolo City and the Rizal towns of Angono, Baras, Binangonan, Cainta, Cardona, Jala-Jala, Morong, Pililia, Rodriguez, Tanay and San Mateo.

Maynilad Water Services, Inc. (MWSI)
The MWSI is MWSS’ concessionaire for the West Zone of MWSS’ service area. The original MWSI is a partnership between Benpres Holdings Corporation, the flagship company of the Lopez Group and Suez Lyonnaise des Eaux of France.

In 2005, Benpres and Suez ceded management and control of Maynilad to MWSS. A competitive bidding was done by the Philippine Government the following year to re-privatize Maynilad.

DMCI-MPIC Water Company, a joint venture between Metro Pacific Investments Corporation (MPIC) and DMCI Holdings, Inc. (DMCI), won the competitive bidding and acquired 83.96% of Maynilad's shares. On January 2007, the new owners took over Maynilad and launched an aggressive five-year investment program to rehabilitate the company and its operations.

Its service area covers Manila (except San Andres), Pasay, Paranaque, Caloocan, Muntinlupa, Las Piñas, Valenzuela, parts of Makati and Quezon City, including municipalities of Navotas and Malabon and parts of Cavite (Cavite City and the Cavite municipalities of Bacoor, Imus, Kawit, Noveleta and Rosario.

Luzon Clean Water Development Corporation (LCWDC)
Luzon Clear Water Development Corporation is the consortium of San Miguel Holdings Corporation and Korea Water Resources Corporation (K-Water) which won the bid for the Bulacan Bulk Water Supply Project on December 2015. The project is set to provide bulk water to three cities and 21 municipalities of Bulacan through the water districts. With this, Bulacan will now be part of the service area of MWSS.

Common Purpose Facilities (CPF)
The CPF are the facilities upstream of La Mesa Dam which includes the Ipo reservoir facilities, the Ipo-Bicti tunnels, Bicti basins, Bicti-Novaliches aqueducts, and Novaliches portal interconnection facilities up to the UATT.

Operationally, the CPF is co-managed by MWCI and MWSI. MWSS has monitoring function over the CPF.

Concession Performance Indicators (end of 2015)

<table>
<thead>
<tr>
<th>Service</th>
<th>East Zone (Manila Water)</th>
<th>West Zone (Maynilad)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Service Connections</td>
<td>976,321 (target: 990,003; 98.6% accomplishment)</td>
<td>1,265,625 (target:1,271,324; 99.55% accomplishment)</td>
</tr>
<tr>
<td>Water Supply Continuity (24/7)</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Water Supply Pressure (16, 7 psi from the 10th anniversary)</td>
<td>99.57%</td>
<td>94.95%</td>
</tr>
<tr>
<td>Water Quality at Plant Outlet (100% at all times)</td>
<td>100%</td>
<td>97.35%</td>
</tr>
<tr>
<td>Water Quality in Distribution</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Sewer Service Connections</td>
<td>123,729</td>
<td>127,549</td>
</tr>
<tr>
<td>Tanks Desludged</td>
<td>67,252 (target:61,990; 108% accomplishment)</td>
<td>142,362 (target:132,083; 107.7% accomplishment)</td>
</tr>
<tr>
<td>Response to Customer Service Complaints (resolved in 10 days)</td>
<td>99.05%</td>
<td>96.39%</td>
</tr>
</tbody>
</table>
Water Security Legacy In Support of International and National Goals

The major final output of MWSS under the WSL is anchored on the hierarchical structure of national and international development goals. The three flagship projects of MWSS - the New Water Centennial Water Supply Project (NCWSP), Bulacan Bulk Water Supply Project (BBWSP), and the Angat Water Transmission Improvement Program (AWTIP) – and the initiatives of the concessionaires in the area of sewerage and sanitation services are all in pursuit of the hierarchical goals in international, Philippine, and sectoral goals.

MWSS recognizes the need to work in partnership with international and local stakeholders. The general public will benefit from such synergy in compliance to agreed standards and targets.
The Water Security Legacy Plan

Water appears to be in endless supply that this life resource is usually taken for granted. However, given the realities of population growth, aging water and sewerage infrastructure, vulnerability to natural calamities and climate change, watershed degradation and environmental abuse, reckless water usage and conservation inaction, flooding and other effects of water misuse, the scenario of a Metro Manila-wide water crisis remains a threat. And a solution both short and long term is imperative. Especially for MWSS’ service area that contributes close to 40% of GDP.

In 2011, MWSS took cognizance of the above and laid down the foundation for a roadmap, a long-term master plan to water sustainability, the Water Security Legacy Plan. The Plan put together all the necessary elements to realize the agency’s general objectives on water. There are 7 separate focus areas of policy and implementation. While specific and defined in scope, these seven overlapping bubbles must always be knitted together and must remain inseparable. One without the other is aimless.

Legacy 1: Water Resources and Infrastructure Development, Management and Protection – To ensure Concessionaires’ compliance to the original Concession Agreement (1997-2022) and the Concession Agreement’s Term Extension (2022-2037) on water resources and infrastructure development, MWSS will a) Ensure the delivery of new water sources that satisfy the projected water demand from year 2011 and beyond; b) Optimize existing facilities and improve on water resources management by way of policy and infrastructure.

Legacy 2: Water Distribution Efficiency – To ensure Concessionaires’ compliance to the original Concession Agreement (1997-2022) and the Concession Agreement’s Term Extension (2022-2037) on water supply connection

Legacy 3: Sewerage and Sanitation Compliance - To ensure Concessionaires’ compliance to the original Concession Agreement (1997-2022) and the Concession Agreement’s Term Extension (2022-2037) on sewerage and sanitation services

Legacy 4: Water Rates Review and Rationalization – a) To protect the consuming public as the ultimate benefactor of MWSS; b) To ensure prudence and efficiency of Concessionaires’ Business Plans; c) To value and recognize the business sustainability of the Concessionaires

Legacy 5: Organizational Excellence – a) To promote a culture of excellence and accountability within the agency and ensure the employees’ general well-being; b) To elevate MWSS to international professional standards in governance, finance, engineering, and guiding principles and mandates of Government Owned and Controlled Corporations

Legacy 6: Partnership Building and Development – a) To strengthen roles and cooperation between MWSS and its Concessionaires; b) To develop and expand new partnerships in delivering the key elements of the Water Security Legacy Program

Legacy 7: Communications and Knowledge Management – To develop a deep respect, appreciation, and intelligent use for water and water resources; b) To make MWSS and its partners respected names in the delivery of a valuable life resource; c) To use available policy, methodology and technology in expanding the roles of all stakeholders for water security of Metro Manila

Water Security Legacy Plan Diagram

1. **Communications and Knowledge Management**
2. **Water Resources & Infrastructure Management, Development & Protection**
3. **Partnership Building and Development**
4. **Sewerage and Sanitation Compliance**
5. **Water Rates Review and Rationalization**
6. **Organizational Excellence**
7. **Water Distribution Efficiency**

The diagram illustrates the interconnectivity of the seven focus areas, emphasizing that none can be isolated.
Legacy 1

To ensure Concessionaires’ compliance to the original Concession Agreement (1997-2022) and the Concession Agreement’s Term Extension (2022 -2037) on water resources and infrastructure development, MWSS will a) Ensure the delivery of new water sources that satisfy the projected water demand from year 2011 and beyond; b) Optimize existing facilities and improve on water resources management by way of policy and infrastructure.

The sustainability of water is one of the principal involvements of MWSS. It is clear in the MWSS’ Charter that “...the proper operation and maintenance of waterworks system to ensure an uninterrupted and adequate water supply is the responsibility of the State” and that “the construction of infrastructure for the purpose of supplying water to the inhabitants of its territory is MWSS’ responsibility.”

This mandate entails complex infrastructure development, management and protection to optimize the water trail from source to tap. Watersheds and rivers need protection. Old dams need strengthening. New water sources need to be developed. Old conveyance systems need retrofitting. New tunnels need to be built. Reservoirs need world-class instrumentation. Downstream facilities need to be upgraded. Treatment and distribution infrastructure need to be monitored. Finally, water rights need to be secured.

The mandate is never ending. It evolves through time with technology, sophisticated software, demand cycles, climate change and other determinants in water resources and infrastructure management, development, and protection.

But, the years ahead will present an opportunity to “future proof” MWSS’ gains.
Legacy 1
Bulacan Bulk Water Supply Project (BBWSP)

Description
The Province of Bulacan (PGB) is the new concession area, the North Zone, that will be provided with treated bulk water to its 3 cities and 21 municipalities to meet growing water demand. BBWSP will expand MWSS’ service area coverage and increase number of households served. Under a Build-Operate-Transfer agreement, winning bidder Luzon Clean Water Development Corporation will undertake the financing, detailed design, construction, operation and maintenance of conveyance pipelines, water treatment facilities and water source over a 30-year concession period. Water rights for use to supply water will come from the 2.6 CMS allocated to MWSS and the 1.9 CMS from PGB for a total of 4.5 CMS. There are three stages of the project:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Project Stage, Water Rights</th>
<th>Construction Period</th>
<th>Cities and Municipalities Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Angat Dam Water Source, 4.5 cms (2.6 cms of MWSS and 1.9 cms of PGB)</td>
<td>24 months</td>
<td>6 (Meycauayan City, Obando, Marilao, Balagtas, Bocaue, City of San Jose del Monte)</td>
</tr>
<tr>
<td>2</td>
<td>Angat River at Bustos and other sources to be identified by the proponent</td>
<td>7 (Bulakan, Calumpit, Guiguinto, Sta. Maria, Malolos City, Paombong, Plaridel)</td>
<td></td>
</tr>
<tr>
<td>3a</td>
<td>Pampanga and Angat River at Calumpit</td>
<td>11 (Angat, Baliwag, Bustos, Pandi, Norzagaray, San Miguel, Dona Remedios Trinidad, Hagonoy, San Ildefonso, San Rafael, Pulilan)</td>
<td></td>
</tr>
<tr>
<td>3b</td>
<td>Other sources identified by proponent and other sources to be identified by the proponent</td>
<td>All 13 towns in stages 1 &amp; 2</td>
<td></td>
</tr>
<tr>
<td>3c</td>
<td>Other sources identified by proponent and other sources to be identified by the proponent</td>
<td>All 11 towns in stage 3a</td>
<td></td>
</tr>
</tbody>
</table>

Approved budget of the contract is P24.435B thru Public-Private Partnership competitive bidding but actual cost will be P16.32B based on the winning bidder's bid price.

How the BBWSP Will Help Bulacan
The water supply in the PGB greatly depends on groundwater sources. All of Bulacan’s municipalities and cities are served by water systems of their respective WDs. Except for Obando and Meycauayan WDs of which 90% of water supply is provided by Maynilad, all the other WDs are abstracting ground water for distribution. Without an alternative source of supply, WDs experience a decline in well-yield and deteriorating water quality due to high-saline intrusion.

For lack of reliable water source, water production cost has remained high. The WDs charge an average tariff of PhP 19.00 per m³ for the initial consumption of 10 m³ per connection per month, the highest at 39.00 per m³. Higher tariffs are imposed by WDs per block increase of 10 m³ of water consumed, which generally affect the business and industrial customers. The BBWSP model is unique in this respect because it provides critical partnerships across the public and private sectors making use of a very low bulk water charge for MWSS customers in Bulacan.

Concession Agreement
The Consortium shall likewise develop additional raw water source/s to meet the total demand of the WDs in the coming years. There will only be a one-time rate rebasing which will be 10 years after operation and which will have a cap of 10%. There is no sovereign guarantee for this project and the corporate income tax is not a recoverable expense in the business model.

Milestones
- Completed the feasibility study in September 2013;
- Approved by NEDA-ICC on 04 October 2013 and by the NEDA Board on 21 November 2013.
- Advertised in newspapers of general circulations the “Invitation To Pre-Qualify and Bid” on June 20 and 27, and 04 July 2014.
- Conducted Pre-Qualification Conference on 17 July 2014.
- Issued the Notice of Award to the winning Bidder, Joint Venture of San Miguel Holdings & Korea Water Resources Corporation on 07 December 2015.
- Signed the Concession Agreement & MOAs with the Water Districts on 15 January 2016.
- Ground-breaking held on 15 April 2016.
Water Security
97% of water supply for Metro Manila is provided solely by Angat Dam
Metro Manila is seen to experience water supply shortfall by 2020
Kaliwa Dam will serve as a redundant water source to reduce dependence on Angat Dam.
The Kaliwa Dam involves a design reservoir capacity of 57 million cubic meters (mcm) with an inundation area of 291 hectares inside the REINA Natural Park, Wildlife Sanctuary and Game Preserve (NPWSG) under Presidential Proclamation No. 1636. The estimated watershed area is about 9,800 hectares.
Description

The New Centennial Water Source – Kaliwa Dam Project (NCWS-KDP) aims to ensure water security and to increase raw water supply in order to meet future water demand. Given Mega Manila’s 97% reliance on Angat Dam, NCWS-KDP will be the redundant water source. The presence of a splay in the West Valley Fault could cause a major crisis. Also, a water demand study requires additional water supply in the year 2022. Without a substantial redundant source, our water supply will be placed in serious jeopardy.

The search for an alternative water source took decades (since 1978) to develop. Several studies were undertaken before it finally got into its current bidding stage. In 2011, when the project was re-launched under the Water Security Legacy Program, the direction was to develop an integrated dam system comprised of the NCWS-KDP and Laiban Dam with hydropower component. However, upon the recommendation of NEDA, MWSS proceeded to undertake the integrated dam system in two phases. The first phase is Kaliwa Dam Project and the raw water conveyance. This will be implemented through a Public-Private Partnership (PPP) arrangement under a Design and Build scheme.

NCWS-KDP involves the construction of a dam with a discharge capacity of 600 million liters per day (600 mld) and a 27.70 kilometers raw water conveyance tunnel with a design capacity of 2,400 mld, with a total project cost of PhP 18.724 Billion. The proposed dam is located in Barangay Pagsanahan, General Nakar, Quezon and in Barangay Magsaysay, Infanta, Quezon, while the watershed area covers Barangay Daraitan in Tanay, Rizal, Barangay Pagsanahan in General Nakar, Quezon and Barangay Magsaysay in Infanta, Quezon. The raw water conveyance tunnel traverses the mountain areas of the towns of Tanay, Baras, Teresa and Antipolo in the Province of Rizal.

The construction of the water treatment plants including the Operation and Maintenance of the whole water system (from dam to treatment plant) is the responsibility of the Concessionaires.

To date, bid documents is targeted to be given to the two pre-qualified bidders in the third quarter of 2016. Target of award is first quarter of 2017.

Milestones

- Completed the feasibility study in September 2013.
- Approved by NEDA Board in 29 May 2014.
- Advertised in newspapers of general circulations the “Invitation To Bid and Pre-Qualify” on October 3, 10, 17 and 31, 2014.
- Pre-Qualified two bidders (Abeima-Datem Consortium and San Miguel Holdings Corporation) on 16 November 2015.
Angat Dam and Dyke Strengthening Project (ADDSP)

**Description**

The project involves the strengthening of the Angat Dam and Dyke. It has been established in past studies that there is a potential risk posed by possible seismic activity associated with splay in the West Valley Fault. MWSS hired Tonkin and Taylor to validate previous research work. MWSS cannot highlight enough the value of ADDSP considering that this 50 year old Angat Dam is Mega Manila’s only water source. ADDSP has a total cost of PhP 5.719 Billion.

A secondary auxiliary spillway and the accommodation of an updated probable maximum flood (PMF) of 12,000 cms were considered in the design. MWSS understands the value of world-class instrumentation and downstream improvements which is why MWSS included it for NEDA Board approval.

The project has four components:

<table>
<thead>
<tr>
<th>Contract Package</th>
<th>Description</th>
<th>Cost (PhP M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Strengthening Works and Auxiliary Spillway</td>
<td>5017.3</td>
</tr>
<tr>
<td>2</td>
<td>Instrumentation (Flood Forecasting and Warning System on Dam Operation)</td>
<td>260.91</td>
</tr>
<tr>
<td>3</td>
<td>Consulting Services (as owner’s representative)</td>
<td>149.30</td>
</tr>
<tr>
<td>4</td>
<td>Flood Control Protection Works (downstream of Angat; part of PGB’s Angat River Downstream Project (ARDIS))</td>
<td>292.39</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>5,719.9</strong></td>
</tr>
</tbody>
</table>

ADDSP was originally set for implementation by MWSS. However, in the light of the Supreme Court decision on 09 October 2012 declaring the award of the Angat Hydro-Electric Power Plant (AHEPP) to Korea Water Resources Corporation (K-Water) as valid and legal, the implementation of the Contract Packages 1 and 3 of ADDSP was transferred from MWSS to K-Water.

Contract Packages 2 and 4 of ADDSP remains to be the responsibility of the government. Department of Budget and Management (DBM) and NEDA approved the transfer of funds directly to the agencies mandated to implement Contract Packages 2 and 4, which are the National Power Corporation (NPC) and the PGB, respectively.

The general contractor is Hanjin Heavy Industries and Construction Co., Ltd.

**Milestone**

- Completed the feasibility study on May 2012.
- Approved by the NEDA Board on 4 September 2012.
- Ground-breaking held on 22 July 2015.
- MOA with PBG signed on 22 March 2016.
- MOA with NPC signed on 3 May 2016.
Legacy 1
MOA Between MWSS and Province of Bulacan Provides Funds for Flood Control/Downstream Improvement

MWSS and NPC signed a MOA on 03 May 2016 involving the transfer of funds by MWSS to NPC for the Angat Dam & Dyke Strengthening Project (ADDSP). Signing the MOA are MWSS Administrator Gerry Esquivel for MWSS and NPC President and CEO Ma. Gladys Cruz - Sta.Rita for NPC, in the presence of officials of both agencies.

The funds amounting to Ph237.16M is intended to finance the Package 2 component of the ADDSP – the Instrumentation for Flood Forecasting and Warning System on the Dam Operation. The amount was originally intended for MWSS to do the package 2 component but a changing of responsibilities was made to effect from the privatization of the Angat Hydro Electric Power Plant (AHEPP) in which K-Water was awarded the project.

Since contract package 2 of ADDSP remains to be the responsibility of NPC, MWSS, with the approval of DBM and NEDA, transferred the funds directly to the NPC subject to the execution of MOA.

MOA Between MWSS and Province of Bulacan Provides Funds for Flood Control/Downstream Improvement

MWSS signed a MOA with the Province of Bulacan (PGB) on 22 March 2016 for the fund transfer of P267M from MWSS to the PGB to cover the cost for Package 4 of the Angat Dam & Dyke Strengthening Project (ADDSP) or the Flood Control Protection Works (downstream of Angat) now under the Angat River Downstream Improvement Project (ARDIP) of Bulacan. The ADDSP was originally a project of MWSS until the Supreme Court decision confirming the award of the Angat Hydro-Electric Power Plant (AHEPP) to K-Water now known as Angat Hydropower Corporation (AHC) which shifted implementation responsibilities. Since contract package 4 of ADDSP remains to be the responsibility of the PGB, MWSS, with the approval of DBM and NEDA, transferred the funds directly to the PGB subject to the execution of MOA.

The MOA signing coincided with the actual transfer of check of P267M. Signing the MOA which was done at the MWSS Board room were PGB Governor Wilhelmino Sy-Alvarado and Administrator Gerry Esquivel of MWSS.
Legacy 1
Rehabilitation, Operation and Maintenance of AHEPP Auxiliary Turbines 4 and 5

Description:

The Project optimizes the financial benefit from MWSS-owned auxiliary turbines 4 and 5 (AN-4 & AN-5). These turbines are installed in the Angat Hydro-Electric Power Plant (AHEPP) located in Norzagaray, Bulacan. Considering that power generation is not the core competency of MWSS and it does not have the organization and expertise to operate and maintain a power plant, MWSS needed to enter into an Operation and Maintenance Agreement with private sector through a PPP scheme for the rehabilitation, operation and maintenance.

The turbines, when commissioned, will contribute much needed 28 megawatts to the Luzon Grid.

It has been established that two power operators in Angat Dam will put at risk water security of Mega Manila. The direction of MWSS to directly negotiate with the main operator, as presented to NEDA-ICC, will not complicate operations but actually secure uninterrupted supply of water.

The Project aims to extend the economic life of AN-4 and AN-5 by another 30 years as well as increase energy output and load capacity to 60 percent through the replacement of existing runners and electro-mechanical equipment. In the process, the Project will also enable MWSS to earn additional revenue through the concession payments to be made by the private proponent.

Milestones

- Completed the feasibility study on July 2012
- Decided by the Supreme Court that the award of PSALM to AHEPP to K-Water as valid and legal on 9 October 2012.
- Approved by NEDA Board on 29 November 2012.
- Advertised in newspapers of general circulations the “Invitation To Pre-Qualify and Bid” on December 12, 19 and 26, 2012.
- Conducted pre-qualification conference on 15 January 2013.
- Published notice of failure of pre-qualification of bidders on 22 April 2013.
- Secured OGCC Opinion stating that MWSS may lawfully negotiate with K-Water on 17 December 2013.
- Secured OGCC Opinion authorizing MWSS to assign PSALM to negotiate with K-Water on 1 December 2014. The MWSS Board, however, recommended that MWSS should negotiate directly with K-Water instead of PSALM.
- Wrote to NEDA-ICC securing approval to negotiate directly with AHC, and an exemption from 2013 NEDA Joint Venture Guidelines on 12 August 2015. Awaiting response from NEDA regarding the matter.
Legacy 1

Sumag River Diversion Project (SRDP)

Description:
SRDP was originally a component of the Umiray-Angat Transbasin Project (UATP). The objective is for raw water from the Sumag River to be diverted through a branch tunnel that will be tapped to the existing Umiray Tunnel, and generate an additional volume of raw water of 2.2 cms to the Angat Reservoir.

The additional volume in the Angat Reservoir adds to the reliability and security of water supply to MWSS’ service area (i.e., Metro Manila including the nearby Provinces of Rizal, Cavite and Bulacan), and will also address the impact of reduced water allocation during summer season and El Nino periods.

SRDP will be funded and implemented by the Concessionaires through the Common Purpose Facility (CPF) Office. It involves the construction of a 2.50m diameter x 600 meters length tunnel with a total cost of PhP 717 Million.

Milestones
- Issued the Notice of Award to the winning Bidder, Cavite Ideal International Construction and Development Corporation on 17 December 2013.
- Issued the Notice To Proceed (except the cutting of trees) on 15 April 2014
- Accomplished 59.57% actual physical accomplishment as of July 2016.

MWSS Pays National Irrigation Agency (NIA) for Permanent Use of 7.5 CMS Water Rights; NIA Uses Payment to Finance Bustos Dam Rehabilitation Project

On March 16, 2016, MWSS was able to settle the long-standing issue on water rights of NIA through the payment of PhP 1 billion to NIA for the permanent use by MWSS of 7.5 cms of the former’s water rights. The additional water rights translate into additional water supply coming from Angat originally apportioned for NIA. For NIA, this has also become a positive development as they will be able to fund their rehabilitation project of Bustos Dam (Angat After Bay Regulator Dam Project) which is used for irrigation purposes.

A MOA was signed between MWSS and the two concessionaires wherein the latter will in turn provide the funds to MWSS representing the payment to NIA, in two equal amounts of PhP 500 million each.

The winning bidder is Isidro T. Parriaga and Guang Xi Consortium.

Earlier, MWSS paid NIA PhP 52 million for the opportunity loss of NIA from MWSS’ usage of the 15 cms of NIA’s water rights during periods of El Nino. This is based on an earlier water permit that MWSS obtained from National Water Regulatory Board (NWRB) (i.e., Water Permit No. 11462) on 25 January 1988.

Milestones
- Held Groundbreaking on 15 April 2016.
To ensure Concessionaires’ compliance to the original Concession Agreement (1997-2022) and the Concession Agreement’s Term Extension (2022-2037) on water supply connection.

The efficient delivery of this life resource requires the latest technology and engineering solutions. The MWSS Charter provides these powers and functions, "xxx .. (3k) To construct works across, over, through and/or alongside, any stream, water-course, canal, ditch, plume, street, avenue, highway or railway, whether public or private as the location of said works may require; (3n) To approve, regulate the establishment, operation and maintenance of waterworks and deepwells within its jurisdiction, operated for commercial, industrial, and government purposes; and to fix just and equitable rates and fees that may be charged to customers.; (3o) To assist in the establishment, operation and maintenance of waterworks and sewerage systems within its jurisdiction in a cooperative basis; (3p) To approve and regulate the establishment and construction of waterworks and sewerage systems in privately owned subdivision within its jurisdiction; (3q) To have exclusive and sole right to test, mount, dismount and remount water meters within its jurisdiction... xxx".

Water distribution efficiency is monitored through the compliance of MWSS’ two Concessionaires (Manila Water Company Inc. managing the East Zone and Maynilad Water Services, Inc. managing the West Zone) to standards and compliance targets. MWSS leads and partners with the concessionaires in infrastructure projects to reduce non-revenue water (NRW). Additionally, MWSS drives the rehabilitation of the transmission systems with the construction of new tunnels and aqueducts.

MWSS plays an important role in determining, improving and managing the integrity of the downstream transmission systems.
Legacy 2

Angat Water Transmission Improvement Project (AWTIP)

Description

The Angat Water Transmission Improvement Project (AWTIP) aims to improve the reliability and security of raw water through partial rehabilitation of the transmission system from Ipo to La Mesa and the introduction of water safety, risk and asset management plans. Originally, the project only included the system downstream of Bigte but it was found necessary to include the tunnels between Ipo and Bigte in the assessment as they form an integral system with the aqueducts downstream of Bigte.

As presented in the feasibility study conducted by the Asian Development Bank (ADB), AWTIP involves the construction of a new tunnel (No. 4) from Ipo to Bigte including intake and outlet works. When constructed, it will facilitate the subsequent rehabilitation of the whole transmission system identified in the assessment report.

Tunnel No. 4 from Ipo to Bigte has a diameter of 4 meters and a total length of 6.30 kilometers, with a design capacity of 19 cubic meters per second. It is financed through an ADB Loan of US$123.64 million with the Philippine government paying taxes of $10.34 million. The concessionaires will pay the loan to ADB. MWSS obtained a minimum guarantee fee interest of 0.25 % of loan instead on the 1 % normally given to borrowing entities. The Department of Finance approved the reduction.

AWTIP, together with the other MWSS infrastructure projects, form part of an integrated water security legacy roadmap.

Milestones

- Signed the Memorandum of Understanding (MOU) last 1 October 2012 by and between MWSS and ADB for a technical assistance grant covering the conduct of feasibility study of the Ipo-Bicti-Novaliches Raw Water Conveyance System Rehabilitation Project.
- Completed the feasibility study on August 2013.
- Secured NEDA Board approval on 29 May 2014.
- Advertised in newspapers of general circulations the “Invitation for First Stage Bid” on February 20, 23, & 27, 2015.
- Received bids from three pre-qualified bidders on 23 March 2016.
- Held the loan signing between MWSS and ADB on 29 March 2016.
- Issued the Notice of Award to the winning Bidder, CMC Ravenna Cooperativa (CMC-RC) on 5 May 2016.
- Unveiled the AWTIP at the Ipo Dam on 26 May 2016.
Legacy 2
From AWUAIP to AWTIP: Maximizing Water Conveyance

Finding new water sources to support the Angat Dam is not the only concern of MWSS. Efficient water conveyance systems also take priority to fulfill its mandate of ensuring a steady supply of potable water to its constituents.

AWUAIP Phase 1

AWUAIP Phase 1 involved the construction of the first 5.5 km of Aqueduct No. 6 (AQ-6) which was completed in February 2006.

AWUAIP Phase 2

The project covered the rehabilitation of the deteriorated first 5.5 kilometers of Aqueduct No.5, the construction of the remaining 9.9 kilometer section of AQ-6 and the interconnection works of the aqueducts. It was completed in July 2012, eight months ahead of schedule as a result of efficient contract management by MWSS and the improved construction methodology of the contractor, China International Water and Electric Company.

AWTIP

Of its current three flagship project in its Water Security Legacy program, AWTIP is about ensuring integrity of water conveyance from the primary water source at Angat Dam to customers.

AWTIP took off from where AWUAIP Phase 2 ended. The original plan covered only the rehabilitation of the aqueduct system downstream of Bigte but the feasibility study found it necessary to include the tunnels between Ipo and Bigte in the assessment as they form an integral system with the aqueducts downstream of Bigte. These tunnels were as old as fifty years old, in poor condition, and not in compliance with structural and seismic requirements, increasing the chances of partial interruption of Mega Manila’s water supply.

As a result, a new tunnel from Ipo to Bigte including intake and outlet works, was identified as the priority undertaking for the transmission system in the AWTIP. When constructed, it will facilitate the subsequent rehabilitation of the whole transmission system identified in the assessment report. This plan will create the least interruption in the water supply distribution system.

The Water Conveyance System

The main sources of Metro Manila’s water supply are Angat, Ipo and La Mesa Dams. The major source is Angat Dam, from where water is funneled directly to Ipo Dam. It then flows a distance of 6.4 kilometers to the three basins in Bicti. The basins control the water flowing from it to the six aqueducts each about 16 kilometers long all going to the La Mesa Dam through the La Mesa Portal.

From La Mesa Portal, 60% of the flow goes to the nearby La Mesa Treatment Plants while 40% of the flow travels again a distance of 6.8 kilometers to the Balara Treatment Plant.

The Balara and La Mesa Treatment Plants process the water from its raw state to clean and potable water through a series of screening and cleansing process. The Balara Treatment Plant has a full production capacity of 1,600 mld and supplies more than six million people throughout the metropolis.

The La Mesa Water Treatment Plant processes 2,400 mld of raw water. It was built with least cost technological package as it has a very minimal electromechanical equipment and relies mostly on hydraulic properties of water to backwash its filter and gravity to convey raw water from the source, into the plant and out into the distribution system.

When both Balara and La Mesa Treatment Plants are in operation, the total processing capacity is about 4,000 mld. The La Mesa Water Treatment Plant serves the western zone of Metro Manila (Maynilad concession), while the Balara Water Treatment Plant supplies the eastern zone of the concession (Manila Water concession).
Legacy 2
Rehabilitation of Umiray-Angat Transbasin Project (UATP) Facilities

Description:

The UATP was constructed and became operational in June 2000. The raw water conveyed through this 13 kilometer tunnel from the Umiray River contributes about 20 – 30% (or 780 million liters per day) of the raw water for Mega Manila. The intake facilities are located at Umiray, General Nakar, Quezon, while the outlet facilities are located in Macua, Dona Remedios Trinidad, Bulacan.

On 29 November 2004, the tunnel and its facilities were severely damaged by a Typhoon Winnie. It caused the complete stoppage of operations particularly the conveyance of raw water from the Umiray River to the Angat Reservoir. The 13 kilometer tunnel was clogged with boulders, logs and other debris. To mitigate water shortage, urgent works were done to declog the tunnel to let the raw water flow through it. On 17 March 2005, after three and a half months of de-clogging works, the Umiray-Angat Transbasin Tunnel was finally cleared of logs and debris allowing the flow of raw water again.

Since the immediate work done was temporary, permanent rehabilitation works had to be continued to strengthen the stability of the structures against flood and typhoons. A Consultant was hired by the Concessionaires which prepared the detailed design.

UATP is funded and implemented by the Concessionaires through the Common Purpose Facility (CPF) Office. Project cost is PhP 748 million.

Milestones

- Received three bids on 29 October 2015
- Issued the Notice of Award to the winning bidder, A.M. Oreta Construction on 28 December 2015
- Issued Notice To Proceed to A.M. Oreta Construction on April 20, 2016
Sewerage and sanitation form the other half of the water services for Mega Manila. The charter directs MWSS to “construct, maintain, and operate such sanitary sewerages as may be necessary for the proper sanitation and other uses of the cities and towns comprising the system.”

The regulatory challenge in ensuring compliance in sewerage and sanitation and implementation of programs is complex given the following factors:

- Congestion in the metropolis
- Availability of land for wastewater facilities
- Acquisition of right of way for sewer lines
- Solid wastes in the influent
- Uncontrollable influent quality
- Capacity and Willingness to Pay
- Consistency in regulations and regulatory environment

Most of the work and attention on sewerage and sanitation services, as provided by the concessionaires, are measured through Key Performance Indicators (KPI) and Business Efficiency Measures (BEMs), collectively referred to as KPI-BEMs. The concessionaires have been meeting these KPI-BEMs (e.g., progress in construction; increase in wastewater treatment capacity; increase in septage treatment before disposal, etc.) set in the Concession Agreement through the following sewerage and sanitation programs that are currently being implemented:

1. Clean-up of Manila Bay
2. Three-River System Improvement Program - a program for the treatment of sewer and wastewater before such water returns to the 3-river system of San Juan, Marikina and Mandaluyong.
3. Continuous desludging of septic tanks per the targets set
4. Breakdown of targets per municipality and city for prioritization and better monitoring
5. Adoption of a creek interception and drainage outflow interception
6. Setting-up of wastewater treatment facilities in defined catchment areas and major interceptor lines
7. Upgrading and expansion of Central Manila Sewerage System
8. Better target and standard-setting and improved design criteria
9. Improved treatment technology and design capacity for Sewerage Treatment Plants (STPs)
10. Improved sewer ordinance and policy-making
11. Continuing awareness campaign on water re-use

The KPI-BEMs of Legacy 3 contributes to the following benefits to the public:

1. Prevention of health risks associated with wastewater
2. Improvement of the quality of water bodies and living environment
3. Rehabilitation of river systems that improves its biodiversity and protects ground and surface water sources from contamination with polluted water.
4. Increased public awareness on the importance of sewerage and sanitation that improves cooperation and encourages households to agree to the following:
   - Household connection to sewer line
   - Proper construction and regular desludging of septic tanks
   - Allowing the construction of treatment plants within their backyard
   - Proper disposal of solid waste.

Although this is a Concessionaire-led effort, MWSS takes an active part in the monitoring of their progress.
Legacy 3
Sewerage and Sanitation Services

MWSS through its concessionaires, Manila Water and Maynilad, is directly responsible for providing sewerage and sanitation services to its customers.

I. East Zone (Manila Water)
A. Wastewater Reliability

The Wastewater Reliability Headline includes projects related to the maintenance and rehabilitation of existing sewage treatment plants (STPs), septage treatment plants (SpTPs), and sewer network. These projects are intended to improve operational efficiency and sustain compliance of the wastewater facilities within the standards.

The Wastewater Reliability Program seeks to enhance and improve existing wastewater facilities and network to ensure effective service delivery. Particularly, projects under this headline include the following key initiatives:

- Improving Reliability of STPs / SpTPs – this involves the improvement of existing STPs / SpTPs to ensure operational efficiency and compliance with standards (replacement/refurbishment of pumps, blowers, MCCs, etc.)

- Improving Reliability of Sewer Network – this involves the rehabilitation of sewer mainlines, specifically in the areas of Sta. Ana Manila, Taguig, Makati, and Quezon City

- Communal Septic Tanks Maintenance & Upgrade – this involves raising of manholes, as well as the inspection and upgrade of communal septic tanks

- Augmentation/O&M of Desludging Trucks – to ensure the operational efficiency of desludging operations, initiatives such as replacement of pumps and sewer jets

- Information and Educational Campaign – this involves numerous awareness campaigns in several communities in order to improve customers higher service take-up for wastewater and sanitation services

Rodriguez Water Treatment Plant Project (RWTPP)

**PROJECT PROFILE**

<table>
<thead>
<tr>
<th>Location</th>
<th>Within the vicinity of the La Mesa Watershed, Payatas Road, Quezon City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>The project involves the construction of intake structure, intake pipe bridge, 1200mm diameter conveyance pipe, 150MLD water treatment plant, treated water pumping station and 40ML reservoir.</td>
</tr>
<tr>
<td>Objective</td>
<td>To supply the long-term demand of the Municipalities of San Mateo and Rodriguez, Rizal and the City of Marikina. The project shall also cease the operation of deep wells in these areas to prevent the further degradation of groundwater sources and to provide efficiency in operation.</td>
</tr>
<tr>
<td>Rationale</td>
<td>Water supplied to Marikina, San Mateo and Rodriguez areas is currently coming from Balara Treatment Plant through the PG-6 line. As the population in Rodriguez and San Mateo areas continues to grow, it is becoming more difficult and costly to push water from Balara to these areas thus, Rodriguez WTP is implemented to deload the PG-6 line and achieve operational efficiency.</td>
</tr>
</tbody>
</table>

**Beneficiary**

Residents of Rodriguez and San Mateo, Rizal; and Marikina City

**Milestones**

<table>
<thead>
<tr>
<th>Milestones</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>RWTP Package 1 (Intake structure, raw water conveyance, 150 MLD treatment plant and treated pumping station)</td>
<td>Project is 100% complete and operational as of August 2012. Process proving was done in August 2013</td>
</tr>
<tr>
<td>RWTP Package 2 (Treated water transmission main and 40 MLD service reservoir)</td>
<td>Project is 100% complete and operational as of February 2012.</td>
</tr>
</tbody>
</table>
Legacy 3
Sewerage and Sanitation Services

B. Wastewater Expansion

The Wastewater Expansion Program aims to reduce the level of pollution caused by untreated wastewater going into the main waterways in the East Zone. Its end objective is to improve water quality of receiving waters and increasing sewer services access.

The Wastewater Expansion Headline falls under two sub-headlines:

1. Manila Third Sewerage Project (MTSP)
2. Master Plan for Sewerage and Sanitation – Headline key projects are as follows:
   - Marikina River Basin Sewer System
   - Taguig North Sub-catchmen (Libingan ng mga Bayani)
   - North and South Pasig Sub-catchment (flugin)

Taking-over of private sewer systems projects are also under the Wastewater Expansion headline, but not part of the projects committed under the two (2) headlines.

B.1 Manila Third Sewerage Project (MTSP)

The MTSP Headline consists of three (3) main components, namely: (1) Septage Management; (2) Sewage Management; and (3) Institutional Strengthening.

A. Completed Projects:

<table>
<thead>
<tr>
<th>Sewerage Treatment Plant (STP)</th>
<th>Beneficiaries (population)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pinagsama STP (Signal Village) 8 MLD STP</td>
<td>41,554</td>
<td>Ongoing coordination with LGU and DPWH on the reconfiguration of sewage flow going to interceptor boxes</td>
</tr>
<tr>
<td>2. South STP (FTI Complex) 2.814 MLD</td>
<td>n/a</td>
<td>Operational</td>
</tr>
<tr>
<td>3. North SpTP (San Mateo) 0.586 MLD</td>
<td>n/a</td>
<td>Operational</td>
</tr>
<tr>
<td>4. East Avenue STP (East Avenue, QC) 17 MLD STP</td>
<td>73,851</td>
<td>Operational</td>
</tr>
<tr>
<td>5. Olandes STP (originally QC Marikina system) 10 MLD STP</td>
<td>40,000 by 2023</td>
<td>Operational</td>
</tr>
<tr>
<td>6. Poblacion STP (Makati) 11 MLD STP; with 1.1 km 200-250mm FRP</td>
<td>40,000</td>
<td>Operational</td>
</tr>
<tr>
<td>7. Road 5 STP (Project 6, QC) 4 MLD STP</td>
<td>10,714</td>
<td>Operational</td>
</tr>
<tr>
<td>8. Capitoluyo STP (Pineda, Pasig) 4 MLD</td>
<td>14,000</td>
<td>Operational</td>
</tr>
</tbody>
</table>
Legacy 3
Sewerage and Sanitation Services

B.2 Master Plan for Sewerage and Sanitation

The Sewerage Master Plan seeks to address the pollution on the three (3) major rivers in the East Zone namely, Marikina, Pasig and San Juan. The new plan which was based on information/data provided by the MWSS Waste Water Master Plan Study by SKM and which framework was updated by a study team commissioned by Manila Water in 2005, had been the centerpiece of the RR08 and CA renewal business plans, using the combined sewer-drainage system approach.

These three rivers have been determined as conveying the most pollution which eventually drains to Manila Bay and Laguna Lake. By using a combined sewer-drainage system that will treat the discharge before going to these water ways, the level of pollution will significantly decrease in these rivers. At least fifteen (15) catchments are proposed to treat the wastewater.

B.2.1 Pasig River Basin: Pasig North and South Sewerage System

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<tr>
<th>PROJECT PROFILE</th>
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<tbody>
<tr>
<td><strong>Location</strong></td>
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</tbody>
</table>
| **Description** | 100 expandable to 120 MLD STP  
65 km of Sewer Network  
37 Pumping Stations |
| **Objective** | To intercept and treat wastewater within the catchment area |
| **Rationale** | Expansion of wastewater coverage |
| **Beneficiary** | 70,357 population by 2017  
658,392 population by 2037 |
| **Target Date of Completion:** | December 2017 |

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<thead>
<tr>
<th><strong>Status</strong></th>
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<tbody>
<tr>
<td><strong>STP</strong></td>
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</table>
| • Mobilization works started  
• Completed 45% excavation works  
• Delivery of equipment ongoing |
| **Sewer Network Pumping Station** |
| • Secured LGU and DPWH permits from LGU and DPWH for South Pasig 1A and 2A, and South 1B  
• 16% accomplishment for South Pasig 1A  
• 3% accomplishment for South 1B)  
• Ongoing legal review of MOA with Sta. Lucia  
• Finalized negotiation for lot acquisition with Greenwoods Phase IV HOA for South Pasig 2  
• Awarded contract to FF Cruz for North Pasig 1 Sewer  
• Ongoing bidding for North Pasig 1 Pump Station and South Pasig 2B (portion of South Pasig 2)  
• Awarded the contract to 21CDC-QMCG for South Pasig 2A (portion of South Pasig 2) |
## Legacy 3

### Sewerage and Sanitation Services

#### B.2.2 Laguna Lake Catchment: Taguig North Sewer System

<table>
<thead>
<tr>
<th><strong>PROJECT PROFILE</strong></th>
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<tbody>
<tr>
<td><strong>Description</strong></td>
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<tr>
<td><strong>Objective</strong></td>
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<tr>
<td><strong>Rationale</strong></td>
</tr>
<tr>
<td><strong>Beneficiaries</strong></td>
</tr>
<tr>
<td><strong>Target Date of Completion:</strong></td>
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<td><strong>Status</strong></td>
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</table>

#### B.2.3 Marikina North Sewerage Project

<table>
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<th><strong>PROJECT PROFILE</strong></th>
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<tr>
<td><strong>Location</strong></td>
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<td><strong>Description</strong></td>
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<tr>
<td><strong>Objective</strong></td>
</tr>
<tr>
<td><strong>Rationale</strong></td>
</tr>
<tr>
<td><strong>Beneficiary</strong></td>
</tr>
<tr>
<td><strong>Status</strong></td>
</tr>
</tbody>
</table>
Sewerage and Sanitation Services

B.3 Take-over of Private Systems

This project aims to rehabilitate and operate private wastewater systems toward eventual integration into the Manila Water wastewater network particularly in areas where there are existing private sewer networks for potential expansion. The project includes:

Sta. Ana Sewer System

<table>
<thead>
<tr>
<th>PROJECT PROFILE &amp; STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
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<td><strong>Status</strong></td>
</tr>
</tbody>
</table>

II. West Zone (Maynilad)

1. **Wastewater Program**

   As of Q4 2015, 99% of the wastewater programs under the San Juan River Basin project have been turned-over and now operational. The ten (10) septage treatment plants with conveyance systems in Quezon City are located at Bagbag, Bahay Toro, Del Monte, Kapiliyan, Paltok, Samson, San Antonio, Tandang Sora, Talayan, and Tatalon.

2. **Manila Wastewater Management Project**

   The sites for the STPs in Talayan, Quezon City, Pasig City, Muntinlupa City, Las Pinas City, and Valenzuela City have been acquired.

   In the South area, five (5) septage treatment plants including its conveyance system are under construction, e.g. Pasay, Cupang Muntiula, and Paranaque. The conveyance system of STP in Valenzuela is currently being constructed. Rehabilitation of the Alabang STP is already completed.

   Sewerage and sanitation infrastructure in the West Zone —
   
   - 56,000 sewer connections.
   - 5 Treatment Plants with 494,000 m$^3$/day capacity (separate system)
   - 15 Treatment Plants with 55,000 m$^3$/day capacity (combined system)
   - 1 Septage Treatment Plant with 370 m$^3$/day capacity
   - 7 facilities under development/construction with 300,000 m$^3$/day capacity
   - 1 SepTP with 250 m$^3$/day capacity
a) To protect the consuming public as the ultimate benefactor of MWSS; b) To ensure prudence and efficiency of Concessionaires’ Business Plans; c) To value and recognize the business sustainability of the Concessionaires

Legacy 4 is anchored on Section (h) and (n) of the MWSS Charter:

(h) To fix periodically water rates and sewerage service fees as the System may deem just and equitable;  
(n) To approve, regulate and supervise the establishment, operation and maintenance of waterworks and deepwells within its jurisdiction operated for commercial, industrial and government purposes and to fix just and equitable rates or fees that may be charged to customers.

Since the MWSS privatization in 1997, along with the improvement in water delivery service coverage and quality, the all-in tariff rates in the MWSS service area also increased. By the 3rd quarter of 2013, consumers had experienced rates grow annually at 14.9% and 11.6% in the East and West Zones, respectively. A report published by the ADB in 2014 titled “Urban Water Supply and Sanitation in Southeast Asia: A Guide to Good Practice”, placed Metro Manila’s tariff as the highest out of the 14 utilities in six countries in the region.

Following the Concession Agreements (CA), the MWSS implemented the Third Rate Rebasing Review in 2012-2013. The Third Rate Rebasing Review is by far the most comprehensive and thorough audit of the Concessionaires’ water rates proposal. It was also the most controversial.

For the first time, water rates in the MWSS service area were to go down.

Consistent with Philippine law and the CA, in the Third Rate Rebasing Review, MWSS excluded the Concessionaires’ Corporate Income Tax (CIT) payments as a recoverable expenditure. This decision resulted in the Concessionaires filing several arbitration cases against MWSS and the Republic of the Philippines, some of which are still awaiting final decisions. In the two main arbitration cases, the decisions handed down were diametrically opposed. One tribunal said CIT is recoverable; the other one said it is not. Given these contradictory positions and the legal issues involved in these cases, MWSS believes that the ultimate resolution of this issue rests with the Supreme Court (SC). Cases filed by third parties on this and related matters are now pending with the High Court. In our manifestations in these cases, we emphasized the urgency of a ruling by the SC on the CIT issue so all parties can finally put this matter to a close.

MWSS management also implemented important reforms during the Third Rate Rebasing Review and in the last six years to further the aims of the Concession Agreements as well as to lay the foundations for more clarity and stability to our regulatory processes. These include development of guidelines on concession accounting and audit, project monitoring and capital expenditure review, Key Performance Indicators/Business Efficiency Measures (KPI/BEM) evaluation, and appropriate discount rate determination.

Understandably, six years are not enough to complete the reform agenda. 2017 is another rate rebasing year, and will be an even bigger challenge until the CIT issue is resolved. Nonetheless, MWSS must continue to act with its eye firmly on the bigger picture – within the framework of law and its contractual obligations, to improve and expand the delivery of a life resource to consumers in its service areas.
Pursuant to the Concession Agreement (CA), a Rate Rebasing (RR) is mandatory every five (5) years. RR is a process that determines the level of rates for water and sewerage services that permits the Concessionaires to recover over the life of the concession (until 2037) its operating, capital maintenance and investment expenditures. RR is also a way to provide appropriate incentives to benefit both the Customers and the Concessionaires.

The RR looks into the historical (past 5 years) performance of the Concessionaires against established targets or commitments. It then updates a reasonable projection of all factors for the remaining concession life with a proposed Business Plan detailing the next five years. The Business Plan needs the approval of the MWSS being the principal and eventual owner of all the facilities by the end of the concession.

As required in the CA, both Concessionaires submitted their respective Business Plans for 2013-2037 within the deadline of 31 March 2012.

Initial review of Maynilad’s Business Plan necessitated a re-submission of an updated “September Business Plan”.

Normally, the determined Rebased Rate is for implementation January 1, of the following year (2013). However, the engagement of independent experts to perform the very complex RR task has been delayed due to prospective experts’ failure to comply with all the stringent requirements of RA 9184, or the Government Procurement Act.

A more thorough examination of the Concessionaires’ past expenditures was conducted in the third Rate Rebasing exercise. Thus, compared to the limited review of transaction listings that had been done previously, the Regulatory Office conducted a proper regulatory audit – i.e., technical and financial audits that entail a comprehensive review of each Concessionaire’s Business Plan and detailed examinations of actual source documents, such as vouchers and receipts – before expenditures were either allowed or disallowed.

Provided in the table below is a comparison of how the previous and 2013 Rate Rebasing exercises were conducted.

<table>
<thead>
<tr>
<th>CONDUCT OF RATE REBASING AUDIT</th>
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<tbody>
<tr>
<td><strong>Financial Audit</strong></td>
</tr>
<tr>
<td>Table audit of documents – reconciled Manila Water’s OCP submissions with audited financial statements.</td>
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<tr>
<td>Ensured exclusion of items specifically disallowed by the CA.</td>
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<tr>
<td>Adopted Key Performance Indicators (KPIs) and Business Efficiency Measures (BEMs) as standards for determining prudence and efficiency of expenditures.</td>
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<tr>
<td><strong>Technical Audit</strong></td>
</tr>
<tr>
<td>Compared Manila Water’s expenditures and standard unit prices with Consultants’ derived unit costs.</td>
</tr>
<tr>
<td>Determined prudence and efficiency of expenditures by comparing with forecasts.</td>
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<tr>
<td>Reviewed performance using KPIs and BEMs, rewards and penalty system.</td>
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<tr>
<td>Adopted the modified Use and Useful Test (20-20 Rule) for evaluation of projects.</td>
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</table>

The highly intensive third rate rebasing exercise resulted in a downward adjustment tariff determination.
PUBLIC CONSULTATIONS

The Regulatory Office conducts public dialogues and consultations, information caravans, consumer awareness campaigns for schools and health centers, and community briefings on sanitations and desludgings. Through these activities, the RO helps consumers become more aware of their basic rights and responsibilities, educate them on relevant issues, and solicit feedback on the practices and policies of the two Concessionaires in providing water and sewerage services.

As part of the third Rate Rebasing, public consultations held clarified issues on sewerage and water sanitation, OPEX, water tariff per cubic meter, additional water meter and pressure, water rate classification, 24-hour water supply, annual performance audit of Manila Water and Maynilad, Rate of Return Base, pipe laying and water connection, water quality, pressure and connection, difference in water tariff between Maynilad and Manila Water, publication schedule of indicative water tariff, OCP, illegal water connection, road restoration bulk water selling with IRRs, proposed water tariff adjustment and on-going and future projects of the two Concessionaires with corresponding proposed investment for the succeeding five years.

The Regulatory Office, while subscribing to the Rate Rebasing framework, considered the paramount concern of the whole process and practised complete adherence to the Concession Agreement and applicable laws, balancing reasonable tariff for consumers against fair returns for concessionaire, observing transparency, and performing policy reviews, clarifications, and enhancement during the rate rebasing process.

RESULTS OF THE RATE REBASING EXERCISE

On 12 September 2013, the Regulatory Office announced a downward adjustment in the average basic water charges, effectively denying the petition of its two Concessionaires to raise average water rates in the next five years as part of the Regulatory Office’s third Rate Rebasing exercises.

The reductions in water rates were due to disallowances for operating and capital expenditures. Substantial disallowances were effected for unsubstantiated expenses, unliquidated cash advances, infrastructure projects, unjustified variation orders, capitalized interest, among others. OPEX Accounts with major disallowances include salaries and benefits in excess of benchmarks, advertising expenses not directly related to Concession operations, unnecessary management and technical fees, donations and sponsorships not related to Concession operations and business meetings and representation expenses not related to Concession service operations, or in excess of paid allowances.

On 12 September 2013, the MWSS Board of Trustees signed two (2) separate resolutions on the Rate Rebasing Determination of both Concessionaires. Resolution No. 2013-100-RO for Maynilad and Resolution No. 2013-101-RO for Manila Water. MWSS approved and ordered a negative adjustment in the average basic charges being implemented by the two Concessionaires.
The Board of Trustees gave its nod to a negative adjustment of 29.47% of Manila Water’s 2012 average basic water charge of Php24.57 per cubic meter. The adjustment will be implemented in five equal tranches of -5.894% per charging year. Manila Water proposed a basic rate increase of Php5.83 cubic meter.

Likewise, the Board approved a negative adjustment of 4.82% of Maynilad’s 2012 average basic water charge of Php30.28 per cubic meter. The adjustment will be implemented in five equal tranches of negative 0.964% per charging year.

This is the first time since the privatization of water services in 1997 rates were ordered reduced. The past two Rate Rebasing exercises resulted in increases in water rates. For Manila Water, records show that from 1997 to 2012, water rates in the East Zone increased more than eight-fold: from Php4.02 per cubic meter in 1997, all-in tariff rose to Php38.12 per cubic meter at the end of 2012. This amounts to an average of 16.2% increase each year for the last 15 years, as shown in the table below:

**Manila Water’s All-in Tariff History (1997 to 2012)**  
[Amounts in Php/cubic meter]

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<tbody>
<tr>
<td>Adjusted All-in Tariff</td>
<td>4.02</td>
<td>4.02</td>
<td>4.37</td>
<td>4.55</td>
<td>6.32</td>
<td>9.37</td>
<td>13.88</td>
<td>14.00</td>
<td>18.64</td>
<td>19.94</td>
<td>20.53</td>
<td>24.86</td>
<td>27.95</td>
<td>30.12</td>
<td>33.57</td>
<td>38.12</td>
<td>37.30</td>
</tr>
<tr>
<td>Cumulative % Increase</td>
<td>0%</td>
<td>9%</td>
<td>13%</td>
<td>57%</td>
<td>132%</td>
<td>245%</td>
<td>364%</td>
<td>394%</td>
<td>411%</td>
<td>519%</td>
<td>597%</td>
<td>650%</td>
<td>736%</td>
<td>849%</td>
<td>829%</td>
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</table>

On the part of Maynilad, records show that from 1997 to 2012, water rates in the West Zone increased five-fold from Php7.21 per cubic meter in 1997, all-in tariff rose to Php44.71 per cubic meter at the end of 2012. This amounts to an average of 13.1% increase each year for the last 15 years, as seen in the next table:
Rate Rebasing Report

Maynilad’s All-in Tariff History (1997 to 2012)
[Amounts in Php/cubic meter]

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</thead>
<tbody>
<tr>
<td>Adjusted All-in Tariff</td>
<td>7.21</td>
<td>7.21</td>
<td>8.22</td>
<td>8.62</td>
<td>14.26</td>
<td>19.92</td>
<td>19.92</td>
<td>19.92</td>
<td>30.19</td>
<td>32.51</td>
<td>32.60</td>
<td>32.05</td>
<td>31.19</td>
<td>37.40</td>
<td>40.00</td>
<td>45.50</td>
<td>41.26</td>
</tr>
<tr>
<td>Cumulative % Increase</td>
<td>0%</td>
<td>14%</td>
<td>20%</td>
<td>26%</td>
<td>176%</td>
<td>176%</td>
<td>176%</td>
<td>319%</td>
<td>351%</td>
<td>357%</td>
<td>344%</td>
<td>322%</td>
<td>419%</td>
<td>455%</td>
<td>531%</td>
<td>479%</td>
<td></td>
</tr>
</tbody>
</table>

ARBITRATION WITH CONCESSIONAIRES

The table below summarizes the issues raised by the Concessionaires in their respective Dispute Notices.

Disputed Issues
Maynilad vs. Manila Water

- Unauthorized disallowance of Corporate Income Tax.
- Incorrect estimate of the Appropriate Discount Rate for Future Cash Flows.
- Unauthorized adjustments to the Opening Cash Position set during the last Rate Rebasing.
- Improper addition of Guaranty Deposits to Maynilad’s Historical and Future Receipts.
- Unreasonable and improper disallowances in Other Expenditures in the Opening Cash Position.
- Unreasonable and improper adjustments to Other Expenditures in the Future Cash Flows.

- The RO erred in its computation of Past Cash Flows, particularly in its treatment of Guaranty Deposits and in disallowing certain items from Manila Water’s past OPEX and CAPEX.
- The RO erred in its computation of Future Cash Flows, particularly on the following:
  - Disallowed OPEX: The RO erred in its projection of Manila Water’s OPEX for 2013 to 2037, particularly in excluding therefrom Corporate Income Tax and reducing Salaries and Benefits, Power, Light and Water, etc.
  - Disallowed CAPEX
- The RO erred in its computation of the Appropriate Discount Rate.
- The implementation of the Regulatory Office’s proposed Rate Rebasing Determination unduly impairs Manila Water’s financial standing and would cause a negative impact on its ability to meet its future obligation targets.

Sources of basic data:
Dispute Notice UNC141/CYK: Maynilad Water Services, Inc. v. MWSS and the Regulatory Office.
Legacy 4
Rate Rebasing Report

In both arbitrations, the issue was limited to the recoverability of the Concessionaires’ corporate income tax. In the arbitration with Manila Water, the Parties resolved all other issues. In contrast, in the arbitration with Maynilad, the Parties did not resolve all other issues; the Appeals Panel applied the pendulum nature of arbitration:

“The Appeals Panel shall... accept either the Rate Rebasing Adjustment as determined by the Regulatory Office or the alternative Rate Rebasing Adjustment proposed by the Concessionaires.” (Section 12.4 (iii) of the Concession Agreement)

Composition of Rate Determinations

Maynilad

<table>
<thead>
<tr>
<th>Php5.52/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Php2.10/m³ “Others”</td>
</tr>
<tr>
<td>Php3.42/m³ Corporate Income Tax</td>
</tr>
<tr>
<td>Php1.46/</td>
</tr>
</tbody>
</table>

Manila Water

<table>
<thead>
<tr>
<th>Php10.84/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Php4.47/m³ Corporate Income Tax</td>
</tr>
<tr>
<td>Php2.77/m³</td>
</tr>
<tr>
<td>Php4.06/</td>
</tr>
</tbody>
</table>

n.b. ▲ Arbitral Award

Responding to the challenges brought about by arbitration, the RO assumed a firm stance against its two Concessionaires as it defended its decision to recommend a decrease in tariff rates and lower water charges.

The prevailing water rates then continued to apply until final decision was reached in December 2015.

The Regulatory Office deferred the implementation of the Final Award for Maynilad based on the following reasons:

The Regulatory Office has the moral and the legal obligation to uniformly apply the General Rate Setting Policy under the Concession Agreements;
As a government entity, the Regulatory Office has the overriding duty to protect and defend the constitutional guarantee to equal protection;
The identical issues raised by Concessionaires involve matters of law and public policy; and
The MWSS has the plain legal duty under its Charter to set “just and equitable rates”.

Despite the arbitration disputes, there have been no changes in the efficient delivery of water and wastewater services to the public. Moreover, the arbitration proceedings served as an impetus to strengthen the delivery of regulatory functions.
a) To promote a culture of excellence and accountability within the agency and ensure the employees’ general well-being;

b) To elevate MWSS to international professional standards in governance, finance, engineering, and guiding principles and mandates of Government Owned and Controlled Corporations

MWSS’ commitment of transformation to a standard of excellence is clearly in the MWSS charter, which is “… (j) to acquire, purchase, hold, transfer, sell, lease, rent, mortgage, encumber, and otherwise dispose of real and personal property, including rights and franchises, consistent with the purpose for which the System is created and reasonably required for the transaction of the lawful business of the same; and xxx … (m) to contract indebtedness in an currency and issue bonds to finance projects as may be expressly authorized by law with the approval of the President of the Philippines upon the recommendation of the Secretary of Finance.”

That MWSS is an engineering company and a responsible government-owned and controlled corporation has not been given much emphasis and impetus until 2011. Change and transformation is imperative in projects, funding, staffing, governance, infrastructure, and virtually every operational and financial aspect to drive excellence.

MWSS likewise recognizes that employee programs are vital for operational excellence. It will comply with civil service programs on performance management and trainings to enhance the skills sets and upgrade skill levels of its employees through continuous trainings and other appropriate mechanisms.

The challenge to rise up from being branded as the poster corporation of corruption and excesses, as reported in the President’s SONA in 2010, was so strong that radical measures had to be instituted to revitalize the agency into a high-performing government entity. Focus was given to the following initiatives:

1. Agency financial turnaround
   a. Remittance of dividends to the national coffers not done from 2008 to 2010;
   b. Rationalization of employees allowances and benefits to what is allowed by law and included in the Collective Negotiation Agreement with the employees;
   c. Collection of one-time payments of past-dues from other agencies and concessionaires;
   d. Prudent investment planning, disciplined project management and customer-focused tariff/price setting;
   e. Compliance with tax laws;
2. Payment of long-delayed retirement benefits dating back to 1997;
3. Compliance with good governance, transparency and accountability conditions by the GCG as committed in a MWSS Manual of Corporate Governance;
4. Implementation of asset management programs;
5. Implementation of business continuity programs;
6. Automation and computerization programs;
7. Inculcation of employee performance management and development programs;
8. Implementation of an early retirement incentive package;
9. Implementation of the MWSS reorganization paving the way for an improved compensation package for employees.

Ultimately, reorganization is imperative to achieve excellence. It will provide the right balance between engineering and administrative staffing. It will facilitate the hiring of qualified personnel to augment the aging population of 106 employees. For the new employees, it will provide the opportunity for the current experts in MWSS to mentor them.

These initiatives create an atmosphere of pride and self-worth as MWSS pursues its mandate to provide water and sewerage services in Mega Manila.
Legacy 5
FINANCIAL TURN-AROUND

MWSS improved its overall financial performance from 2011 to 2015. The improvement was largely due to a prudent approach in financial spending eliminating costs that were unnecessary and without legal bases. At the same time, MWSS improved its collection and revenue-generating measures.

Fiscal Measures

MWSS undertook the following in 2011-2015:

1. Spent prudently for operating expenses, including discontinuing payments of expenses that the Commission on Audit (COA) noted were without legal basis. By 2015, personal services expenditures of MWSS were half of what they were in 2010.
2. Implemented initiatives to increase business income
   a. Collected reasonable compensation for the use of the San Juan stockyard by Manila Water for the period 1997 to February 2015; entered into a contract with Manila Water for the regular payment of lease rates 2015 onwards.
   b. Entered into a settlement agreement with PSALM for longstanding inter-agency receivables/payables over Auxiliary Turbines Nos. 4 and 5.
   c. Adjusted rates upward for the lease of MWSS properties/facilities and collected past dues from tenants.
3. Worked for adopting flexibility in concession income from the BBWSP beginning 2018. Unlike the financial arrangement for the Metro Manila concessions which effectively cap the concession fees to be earned by MWSS, the concession fee in the BBWSP was made a percentage of the revenues to be earned by the Bulacan bulk water concessionaire; thus, paving the possibility of unlimited revenues from the Bulacan concession.
4. Management has a proposal for approval by the NEDA-ICC for a concession agreement for Auxiliary Turbines Nos. 4 and 5.

Increasing Annual Net Income

MWSS’ efforts to manage its finances prudently are reflected in the progressive improvement of its net income. Figure 1 shows the increasing positive net income for the period 2011-2015, a turnaround after net losses in the previous three years.

In 2011, MWSS focused on improving operational performance that yielded cost reductions following the targets set in Legacy 5 of the WSLP. Fiscal discipline ensured that MWSS was able to deliver its Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) target as agreed upon with the Government Commission for GOCCs (GCG). It is also the reason why over the period 2011-2015, MWSS was able to pay dividends annually to the National Government which totaled PhP 1.514 billion over the period 2011-2015, significantly more than the figure for the previous 5 years.

Personnel Services (PS) and Maintenance and Other Operating Expenses (MOOE) expenditures both decreased during the period 2011 to 2015. This was the result of the rationalization of the employees’ and the Board of Trustees’ allowances and benefits up to what was allowed by DBM and GCG.

Spending for PS decreased from PhP 1 billion during the period 2006 to 2010 to PhP 811 million (22% lower) for the period 2011 to 2015.

For MOOE, spending decreased from PhP 2.7 billion in 2006 to 2010 to PhP 751 million from 2011 to 2015 (72% lower). MOOE in 2015 would have been even lower if not for the PhP 77.5 million in back taxes MWSS had to pay to the BIR as a result of the non-withholding of taxes on employee benefits paid in 2009. MWSS successfully worked out with the BIR the waiver of interest and penalties on this tax liability, which would have amounted to approximately PhP 100 million.
Legacy 5

MWSS Remits P150M in Dividends to National Treasury for 2015

Since 2011, MWSS consistently remitted dividends totaling Php 1.3 billion. For 2015 alone, MWSS gave Php 150 million to the National Treasury on 10 May 2016 as partial dividends remittance. From 2008 to 2010, MWSS did not remit dividends to the national treasury. The dividend payment to income (net profit) proportion for years 2011 to 2015 is 35.8%, while for the years 2005 to 2010, the proportion was only 18.9%.

The remittance was formally acknowledged by the President during the GOCC Day held at the Malacañan Palace on 23 May 2016, along with the remittances of other Government Owned and Controlled Corporations (GOCCs). Some 54 GOCCs represented by their respective chief executive officers (CEO) and/or representatives were honored in the event as they handed over their checks to President Aquino.

With this year’s (2016) theme “Building the Nation through Good Corporate Governance,” President Aquino gave thanks to the remitting GOCCs and said that the total remittance for the past six years of his Administration amounted to P164.33 billion. This is almost twice the sum remitted by the previous Administration of P84.18 billion from 2001 to 2010.

Since 2012, the Governance Commission has continued the tradition of the annual ceremonial turnover of GOCCs’ dividends and recognition of GOCCs that made significant contributions to national development.
Legacy 5

Increase of MWSS’ Debt Ceiling and Capitalization

As a result of the MWSS’ infrastructure improvements over the five year period, existing water supply is enough to meet current demand. Demand-supply studies however indicate, that starting 2019, as a result of population growth and the aggressive service coverage targets under the Concession Agreement, aggregate supply is projected to fall short of demand.

During the NEDA Cabinet evaluation of the NCWS-KDP, it was pointed out that the MWSS debt ceiling is inadequate to absorb the liability for this PPP project. It is for this reason that MWSS is co-implementing the project with DPWH, where MWSS will use the debt ceiling capacity of DPWH.

MWSS is working on the increase of its capitalization and debt ceiling to meet the staggering amount of investments under the MWSS Water Security Infrastructure Roadmap (MWSIR).

Immediate infrastructure projects under the MWSIR to bridge the demand-supply gap are:

1. Angat-Umiray optimization which would require future rehabilitation of Tunnels 1-3 and Aqueducts 3-4.
2. Kaliwa-Laiban integrated system, developed not only to supply future demand but also as redundant water source to Angat Dam.

MWSS secured a technical assistance grant from ADB to study, among others, the increase in dollar debt ceiling needed to support MWSS loan projects and increase the peso debt ceiling needed to partially fund resettlement cost of Laiban and the local costs of the loan projects.

Development of new long-term water sources, rehabilitation of existing conveyance facilities and expansion of infrastructure on sewerage and sanitation require huge capital investments. The increase in MWSS’ capitalization and debt ceilings will benefit the consumers in the form of world class infrastructure that can sustain future demand at lower tariff increases.

CSC Approves MWSS December 2014 - December 2017 CNA

The Civil Service Commission (CSC) approved the Collective Negotiation Agreement (CNA) between the MWSS Labor Association (MLA) and MWSS Management via the release of the Certificate of Registration by the CSC of the CNA (No. 846) on the 28th January 2015. The CNA symbolizes a peaceful settlement of differences and grievances and promote harmony, efficiency and productivity for the mutual benefit of MWSS and the MLA.

The MLA acts as the Collective Negotiating Unit (CNU) of the those who hold positions of up to Salary Grade 24. It acts as the sole and exclusive negotiating representative of all covered employees.

Signatories for the CNA were MWSS Administrator Gerry Esquivel and the MLA President.

The CNA which has an effective period of three years from 18 December 2014 to 18 December 2017 underwent various amendments before the final version was approved by the CSC, pursuant to the Amended Rules and Regulations Governing the Exercise of Government Employees to Organize the CNA.

The areas of cooperation include elements of harmonious co-existence between employer and employee such as the following: (a) Management Prerogative and Shared Responsibility and Accountability; (b) Recruitment, Placement and Professional Growth and Development; (c) Labor Education; (d) Sports, Recreation, Culture and Social Integration; (e) Safe, Healthy and Conducive Work Environment; (f) Employee Benefits Program.

BNP Paribas

On March 2011 MWSS successfully retired, sans default interests or penalties, the USD150 Million 7-year Bond/Notes that BNP Paribas floated for MWSS in 2004. MWSS was constrained to enter into the Subscription Agreement to raise, at 9.25% p.a. yield, the funds needed to continue servicing its then outstanding domestic and foreign loans after Maynilad unilaterally suspended, in 2001, the payment of concession fees for that purpose.

The nine years that followed Maynilad's default saw MWSS in its first major arbitral dispute, taking over the management of the Maynilad service area, bidding out of Maynilad's controlling shares that was won by the DMCI-MPIC consortium, and exit from corporate rehabilitation. MWSS and Maynilad are presently exerting efforts to try to resolve the remaining issues and avoid another arbitration.
Legacy 5
MWSS Completes Payment of the Long-Delayed Retirees’ Benefits by 2012

MWSS completed in 2012 the payment of additional retirement benefits of the remaining 1,000 MWSS retirees retired in 1997 under the R.A. 1616 scheme. For the convenience of the retirees a one-stop payment center was installed where the retirees, comfortably transacted business.

MWSS paid P346 million to 1,131 retirees who invoked the provisions of RA 1616 which the Supreme Court recognized in 2008 after an eight-year legal battle between the claimants and the Commission on Audit. The additional retirement benefit is on top of the pension benefits the retirees received in 1997 under the Early Retirement and Incentive Package (ERIP).

MWSS Complies with the Code of Corporate Governance as Directed by GCG

The MWSS Manual of Corporate Governance was crafted pursuant to the requirements of Section 42 of the Code of Corporate Governance of GOCCs issued by the Governance Commission for GOCCs (GCG) in its memorandum Circular 2012-07.

The Manual aims to ensure that MWSS’ operations are conducted in a transparent, responsible and accountable manner and with utmost degree of professionalism. It lays down the following functionalities of MWSS

- Role of MWSS in national development
- Role, duties and obligations of the MWSS Board of Trustees
- Role of MWSS management

Moreover, it states the Corporate Social Responsibilities of MWSS and the latter’s relations with MWSS’ stakeholders.
Legacy 5

Rationalization of Office Spaces—Consolidation on the 4th Floor of the MWSS Main Building

In 2011, the staff of the MWSS Corporate Office (consisting of 127 personnel) were scattered in three floors of two buildings. After careful review, all offices were transferred to the 4th floor on the MWSS Main Building. As a result, 1,573 square meters were freed up and now rented to government agencies and concessionaires with an income of P6.9 Million per year.

The conversion from dedicated private offices to open office set-up had resulted in improvement of operations, promotion of transparency and generation of additional revenues. Communication and collaboration between departments are manageable within one floor. Team cohesion was strengthened as everyone is completely accessible, making employees feel they are part of every activity/program.

With no fixed partitions and private rooms in place, space utilization was maximized and the layout of the office was rearranged with little or no expense. The ratio of personnel per square meter improved from 24.7 to 19.7, a 20% improvement.

Doing business was likewise improved as customers and visitors need not go to various locations to complete their transaction.

An annual savings of P1.5 Million was also realized with the reduction of security and janitorial services and the sharing of resources e.g. internet connection, office equipment. Power consumption annual savings is about PhP 2.7 million as well.

Transparent 5th Floor Offices

The Board and Management created a business atmosphere that ensures that its operations are conducted in a formal and transparent manner. Wood partitions were replaced with glass panels. Doors provide a view to ongoings in a room. As a result, the officers and employees of MWSS are aware at a glance of the meetings that transpire in the offices.

The Board Room/ The Chairman’s Room

Bulwagan of MWSS

The New MWSS Library
Legacy 5

MWSS’ Title Standardization Program

With technology playing a big role in MWSS’ operations, MWSS subscribed to Land Registration Authority’s (LRA) E-Title or the Land Title Computerization Project. The standardization of MWSS’ certificate of landholdings from paper into digitized form ensured the faster processing of transaction between MWSS and LRA. MWSS experience in the reconstitution of manually-issued certificates of title, is tedious and expensive. The E-Title program provides support, processes and resources required for the timely and efficient conversion of certificates of title in secure form and data base.

There are 496 certificates of titles under the name of MWSS. The titles are in various conditions but most of titles are of poor quality because of the passage of time, poor environment and poor handling. E-Title will answer the physical retrieval of the original copies of the certificate which will allow better security against fraud, tampering, loss and physical deterioration.

The ProMIS (Property Management Information System)

To enable efficient and faster implementation of the Water Security Legacy program, MWSS embraced the need to adapt to the rapid evolving engineering technologies in its system. One of these is the Geographic Information Systems (GIS), a fast and reliable geographic data storage, retrieval and analysis tool.

The MWSS’ GIS is called Property Management System or ProMIS. In it are encoded the MWSS’ Right of Way assets and Land Rights for easier access and organized data storage. Monitoring of these assets is also aided by the ProMIS.

MWSS land assets recorded in the ProMIS are in tabular electronic spread sheet files and hard copies. These assets are uniquely identifiable in the system by either land titles or approved survey plans and technical descriptions.

Although these land assets have been identified by titles and survey plans, locating them on the ground proved to be quite a challenge since land titles do not specify exact address of the lot described in it. Most land titles only specify the municipality where the lot is located. ProMIS utilizes geographic information systems to compute the exact location of lots described in each title and survey plan. These locations are then projected in a map where the lots can be easily located down to the nearest road or street, thus enabling easier physical inventory of these land assets.

Out 829 MWSS real estate properties, 682 lots were already encoded in the GIS. 147 lots do not have titles or technical descriptions, thus are not included in the system. MWSS is seeking assistance from the Land Registration Authority and the Land Management Bureau of the Department of Environment and Natural Resources to locate these remaining lots.

Conceptualization of WSL infrastructure projects requires understanding of the project location and environment. Spatial data that were gathered during the feasibility studies of these projects were integrated into a Geographic Information System that would allow fast and accurate production of maps needed for analysis and presentations. Problems that require spatial data analyses are easily solved using GIS and ensure that all geographic information are in one coordinate system. Some of the maps produced using GIS under the ProMIS are the (1) Inundation Area for Kaliwa Dam (Figure 1); and (2) Watershed Boundaries, Facilities and Future Projects for MWSS Water Sources.
Recovering Land

Because of its conveyance right of way (ROW), MWSS may be considered as the biggest landowner in the water sector industry in the Philippines. Clearing its ROW of informal settlers is a continuing activity. But, the same is not limited to the marginalized or low-medium income families who settled illegally on the MWSS ROW.

When years of trying to amicably settle their differences failed, MWSS finally initiated the judicial proceedings necessary to nullify the long-term lease and land development contract that the previous administration entered into with SM Prime Holdings. These proceedings were necessary after it was determined that the contract was entered into without the prerequisite authority from the MWSS Board of Trustees. MWSS has also initiated criminal prosecution of the erring officials before the Office of the Ombudsman.

Disposal of Unserviceable Assets

Successfully disposed through public bidding were 23 units of MWSS unserviceable/scrap vehicles and other scrap materials and office equipment located at the Balara Warehouse, PAG-ASA Compound an the La Mesa—SCAA Stockyards. This disposal resulted in a PhP 2.42 million net income for MWSS. Another benefit of the effort was to create parking space for employee vehicles previously occupied by the scrap vehicles.

Unserviceable vehicle disposed

Additional parking space
Balara Water Hub

The Balara Water Hub is envisioned by MWSS to become a “Center for Water Excellence” in the future.

The development of Balara, estimated to cost P20 billion, will involve the construction and making operational an international center for water excellence within MWSS’ Balara Compound in Quezon City. The proposed 75-hectare hub is envisioned to be a mixed-style destination for education, sports, business and recreation. The area will showcase existing eco-efficient water technology and will be equipped with entertainment facilities. It will also have open areas for large events and commercial development.

The Plan finds legal basis from Section 3 of the of P.D. No.425, which amended R.A 6234 (MWSS Charter), which states that

"...In the prosecution and maintenance of its projects and plants, the System shall adopt measures to prevent environmental pollution and shall enhance the conservation, development and maximum utilization of national resources, including the improvement and beautification of its reservoirs, filter plants, and other areas to promote tourism and related purposes, and shall provide for the necessary corporate funds therefor."

Balara is situated south of Commonwealth Avenue and east of Diliman. The 60-hectare Balara Filters Park (Balara Park) was originally built from 1949 to 1959 and was first opened to the public in 1953. Since large malls did not exist at that time, it easily became the area’s premiere family weekend destination. Its public pools were full of people trying to escape the summer heat and it became the envy of other countries in the region.

From the time it opened in 1953, the MWSS operated the park until shortly after the MWSS privatization in 1997 when it was turned over to the Manila Water Company Inc. (Manila Water) as part of the Concession Agreement. The park is actually composed of recreational facilities, along with two huge filtration plants, administrative buildings, and the housing facilities of Manila Water employees who are on call 24 hours a day to ensure that the plants are fully serviceable. The plants treat 1,600 million liters of water daily and distribute these to three million residents and thousands of businesses and industries in the East Zone.

MWSS’ Business Continuity Programs (BCP)

MWSS bears a significant burden to continue operations under all conditions, including during planned and unplanned events. This responsibility is not easy considering Metro Manila’s susceptibility to floods, and climate related events such as drought which are increasing in frequency and severity.

Since 2011, Management has advanced the concepts of resiliency within lifeline and infrastructure systems to operational hazard-related threats. To minimize interruptions to continuity and recover the “mission essential functions” the following were undertaken:

1. Commissioned experts to conduct probabilistic seismic hazard studies for Angat and other critical facilities.
2. Rehabilitated and retrofitted major transmission lines and headworks.
3. Rehabilitated reliability lines using seismic-resilient materials and state-of-the-art technologies.
4. Preserved water supply augmentation facilities.
5. Purchased emergency mobile water treatment units, tankers, anti-seismic storage facilities, and emergency equipment.
6. Developed disaster preparedness programs where employees were given opportunities to practice the required functions and procedures to keep the Business Continuity Plan at optimal efficacy.
7. Tightened policies on project design, location and operation of new and upgraded infrastructures. By having the right policies in place, there is the opportunity to ensure that the Concessionaires’ investments support exemplary investment practices and compliance with regulation and standards for a resilient infrastructure.

Under a joint BCP with the Concessionaires, a Crisis Management Command Set-up established internal and external cooperation which links government and private systems for adverse events that may affect both water quality and quantity which potentially affects the public health and safety. The set-up authorizes Managers to take appropriate action to prevent hazards to the health and safety of personnel, property, and business operations. Leaders of incident response, business continuity, and communications are authorized to take immediate action to protect people and property.
Legacy 5

Information System Strategic Plan (ISSP)

MWSS is compliant with the Office of the President Memorandum Order No 237, Section 1, which states that, “All government agencies and other entities with projected information technology resource requirements are required to submit their Information Systems Development Plans (Information System Strategic Plans) to the Department of Budget and Management for approval, upon the recommendation of the National Computer Center (NCC), to serve as the basis for rationalizing the allocation of government funds for this purpose.”

The ISSP for MWSS Corporate Office was approved and endorsed by the NCC on 22 August 2013 for the year 2013-2015. It presents the overall strategic plan for the development and implementation of information systems, the use of information and communication technology (ICT), as well as the corresponding resource requirements over a fixed period. The said plan covers the following schedule:

<table>
<thead>
<tr>
<th>A. ICT PROJECTS IMPLEMENTATION SCHEDULE</th>
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</thead>
<tbody>
<tr>
<td>NAME OF ICT PROJECT/S</td>
</tr>
<tr>
<td>Construction and Installation of Data Center</td>
</tr>
<tr>
<td>Email Collaboration System</td>
</tr>
<tr>
<td>Network Monitoring System</td>
</tr>
<tr>
<td>Security Information &amp; Event Management System</td>
</tr>
<tr>
<td>MWSS Portal</td>
</tr>
<tr>
<td>Disaster Recovery System</td>
</tr>
</tbody>
</table>

As an initial step, the MWSS Corporate Office successfully procured computers needed to replace the aging units at hand. Licensed software and printers have likewise been distributed to the staff.

The next step is the procurement of the services of a contractor for the development and installation of a data center.

<table>
<thead>
<tr>
<th>B. INFORMATION SYSTEMS (IS) IMPLEMENTATION SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME OF INFORMATION SYSTEMS/</td>
</tr>
<tr>
<td>Project Management/Monitoring System</td>
</tr>
<tr>
<td>Property Management Information System</td>
</tr>
<tr>
<td>Document Management System</td>
</tr>
<tr>
<td>Knowledge Bank System</td>
</tr>
<tr>
<td>Business Continuity Management System</td>
</tr>
<tr>
<td>Concession Monitoring System</td>
</tr>
<tr>
<td>Human Resource Information System</td>
</tr>
<tr>
<td>Financial Management Information System</td>
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<tr>
<td>Business Intelligence Executive Support System</td>
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Four-Course Competency Training for MWSS Corporate and Regulatory Offices Conducted in 2016

To further elevate the state of human resource management and organization development in the office, MWSS entered into a MOA with the CSC to conduct a Four-Course Competency Training for key officers and employees. This will hasten the development of a Competency-Based HR System which is one of five of the CSC Initiatives. The areas are mainly in:

1. Competency Modeling and Profiling which provides guidance for the application and use of competencies in enhancing MWSS recruitment and promotion system.
2. Development of Competency-Based Qualification Standards and Job Descriptions which includes the development of competency models that will be used as the basis for the identification and construction of competency-based position profile and job description.
3. Competency Assessment which teaches how to a) create an assessment tool, b) identify evidence need to assess competence, and c) prepare an evidence guide.
4. Integration in the Recruitment and Promotion System which enhances the ability to write competency statements and performance criteria.

The training session was conducted over a course of three months from February to April 2016 with the Human Relations team coordinating the effort.

Strategic Performance Management System

In compliance with the Civil Service Commission (CSC) Memorandum Circular 6 s 2012 which provides the Guidelines in the Establishment and implementation of the Strategic Performance Management System (SPMS), CSC approved the MWSS SPMS last July 2013. This is another one of five of the CSC Initiatives. The SPMS focuses on linking individual performance with the MWSS’ organizational vision, mission and goals. This ensures that the employee achieves the objectives set by the organization and that the organization o

MWSS has consistently applied SPMS since 2013 when it was approved. It has been the basis for the granting of the performance-based bonuses. Additionally, these processes are now inculcated in the yearly planning cycle. Performance planning and commitment are set in direction setting meetings after which the office commitments are prepared by the department managers followed by the individual commitments. Performance monitoring and coaching is required for all employees especially for employees falling in performance. Departmental Performance Review and Feedback is done throughout the year and departmental accomplishments are validated by a team created by the Administrator. Institutionalized as well is the Performance Management Team that reviews the individual performances and determines the performance based bonuses.
Reorganization

The most important resource of any agency is its human resource.

Fully aware of this and driven by the imperatives of the Water Security Legacy, Management began working to implement a full corporate reorganization. The initiative for reorganization is also in consideration of the fact that as MWSS is basically an engineering outfit, there seems to be a lopsided imbalance in the proportion of technical versus non-technical personnel complement. Only 18 percent of the existing personnel complement are technical people; the rest are non-technical with 28% made up of clerks and 8 percent are drivers. Also, the median age of MWSS personnel is 56 years old.

The Administrator’s team with co-implementation from consultants (in its drafting period early on) provided a fresh perspective on the needed organizational structural reforms. A series of consultations with CSC, DBM, GCG and GSIS were made to ensure that the resulting Plan complies with applicable laws, rules and regulations. Consultations with department managers and employees to determine future job requirements, and alignment with major final outcomes were also part of the process.

The organizational review highlighted the need for a reorganizational restructuring in consideration of the following:

- To further strengthen performance by MWSS of its legal mandates;
- To effectively address evolving issues in dam and watershed management, climate change, and new water-related technologies;
- To develop new policies and strengthen their implementation as a result of the privatization where concession management & water/sewerage partnerships & inter-agency liaison management & interpretation of policies have become necessary;
- To ensure that the correct positions and competencies are available within the organization, as required by the Philippine Constitution in promoting an appropriate civil service (in fealty to R.A. 6656, Section 12 on Reorganization);
- To transform the MWSS as an engineering company capable of implementing the major water infrastructure projects and programs under the WSL;
- To establish a culture of continuous improvement, by institutionalizing a bias toward innovation and technology and good governance.

The Board, in October 2012, approved Management’s recommended structure for submission to GCG. The GCG approved the Reorganization Plan in March 2013, per GCG Memorandum Order 2013-17 with 128 positions.

Engaging employees has been a key concern of senior management in the implementation of the Plan. As part of the transition to the approved Reorganization, Management did the following:

1. Initiated joint reviews between MWSS and CSC of the Qualification Standards (QS) for each position in the approved plantilla to assure the employees that CSC reviews the proposed QS.

2. Proposed an Early Retirement Incentive Package (ERIP) in 21 November 2014, which was subsequently approved in December 2015 by the Office of the President, as follows:

<table>
<thead>
<tr>
<th>Years of Service</th>
<th>ERIP</th>
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<tbody>
<tr>
<td>Less than 21 years</td>
<td>1.00 x BMP x No. of years in service</td>
</tr>
<tr>
<td>21 to less than 31 years</td>
<td>1.25 x BMP x No. of years in service</td>
</tr>
<tr>
<td>31 years and above</td>
<td>1.50 x BMP x No. of years in service</td>
</tr>
</tbody>
</table>

ERIP implementation guidelines was submitted on 13 June 2016 to the MWSS Board of Trustees. The guidelines provide for the utilization of the ERIP budget in the Corporate Operating Budget to fund not only the ERIP implementation but also for the payment of the Separation and Retirement Benefits that MWSS is supposed to pay as mandated by R.A. 6656, An Act Protecting the Security of Tenure of Government Employees in a Reorganization, and applicable retirement laws by the GSIS.

3. Proposed placement guidelines of personnel in a Reorganization pursuant to GCG MO 2013-17, for the Board’s approval. The constitution of the Placement Committee pursuant to RA 6656 after the election of 1st and 2nd level employees’ representatives is also already in place with the issuance of Office Order No. 2016-40.

4. Conducted competency training in 2016 so officers and employees training can assist in the development of job descriptions compliant with the CSC Competency-Based Performance Management System.
Creation of a Project Management Office (PMO) for WSL Flagship Projects

To reiterate, MWSS has three flagship infrastructure projects namely, Bulacan Bulk Water Supply Project (BBWSP), Angat Water Transmission Improvement Project (AWTIP) and the New Centennial Water Source—Kaliwa Dam Project (NCWS-KDP). With the notices of award conferred to the BBWSP and the AWTIP, there is an urgent need to create project management offices to complement the organic workforce in the continued planning, implementation, coordination and monitoring of these projects. MWSS Management requested approval for PMOs based on DBM National Budget Circular No 485 dated 13 March 2003. After the MWSS Board approval under MWSS Board Resolution No. 2015-123-CO, the request was submitted to GCG and was subsequently approved on 23 November 2015 under GCG Memorandum Circular No. 2015-14.

Hiring for the PMOs for BBWSP and AWTIP is a top priority as we await the implementation of the MWSS Reorganization. In all, 36 positions were created, eight positions to be filled up by organic personnel while 28 positions are to be filled up by coterminous with the project employees.
a) To strengthen roles and cooperation between MWSS and its Concessionaires; b) To develop and expand new partnerships in delivering the key elements of the Water Security Legacy Program

MWSS recognizes stakeholders as vital partners in the achievement of its goals and encourages active participation with them in all possible areas of cooperation.

The concessionaires have become the major stakeholder by virtue of the concession agreements signed in 1997. Local government units play a key role especially in the implementation of infrastructure projects. Partner agencies oftentimes serve as the clearing house of major programs and as such are in regular communication with MWSS. Indigenous people who live near our water sources deserve our goodwill. People affected by the MWSS’ right to eminent domain include private individuals and informal settlers. Fund sources from both public and private entities including overseas assistance are major partners in water security. MWSS will likewise be participative in social responsibility undertakings especially in the event of disasters.

MWSS believes that working with these entities bring about a synergy of energies resulting in a more powerful consolidated result greater than the individual collective outcomes of each of the entities. This partnership building will ensure the wholistic and integrated water resource management to benefit Mega Manila consumers.
MWSS To Receive PhP 103 million from PSALM

MWSS built and owns auxiliary units numbers 4 and 5, which are situated within the AHEPP Complex, with a capacity of 10 MW and 18 MW, respectively, which until the takeover by the Angat Hydro-Power Corporation (K-Water-San Miguel consortium) were operated by the National Power Corporation (NPC). MWSS also constructed the Umiray-Angat Transbasin Project (UATP) which contributes an average of 12.1 cubic meters per second of raw water supply from the Umiray River to the Angat Reservoir.

At the onset of the Angat Water Supply Optimization Project (AWSOP) operation in 1993, NPC started to claim for energy and capacity losses at the Angat Hydro-Electric Plant (AHEP) due to the shifting of the NWRB sanctioned 15 cms outflow from the Main Units towards the Auxiliary Units. This was a result of additional allocation of 15 cms MWSS received from the NWRB in 1988 for domestic use. The 15 cms represents the unutilized portion of the water allocation granted by the NWRB to National Irrigation Authority (NIA).

The main power plants of the AHEPP were built and previously owned by the National Power Corporation (NPC). However, pursuant to Republic Act No. 9136, otherwise known as the “Electric Power Industry Reform Act of 2001 (the “EPIRA”) EPIRA, PSALM was created to take ownership of all existing generation assets, real estate and other disposable assets of NPC with the principal purpose of managing the orderly sale, disposition and privatization of NPC generation assets, real estate and other disposable assets.

The confluence of all these occurrences has generated claims and counterclaims from both NPC and MWSS of revenue distortions.

MWSS claims PhP 1,236 Billion for the payment of its share in the revenue from the power generation of AN-4 and AN-5. NPC on the other hand required MWSS to pay P6.171 Billion for energy and capacity losses. After a series of inter-agency work and coordination between NPC/PSALM and MWSS, it was decided that MWSS is entitled to claim P303 Million, subject to the final validation by PSALM.

MWSS and the PSALM have now entered into a Settlement Agreement to effect the latter’ settlement of MWSS’ claim for revenue generated from AN 4 & 5 in the final net amount of One Hundred Two Million Three Hundred One Thousand Five Hundred Six Pesos and 88/100 (PhP 102,301,506.88).
Coordination with Local Government Units (LGU)

The plight of affected inhabitants of MWSS’ dam infrastructure projects is an important consideration in planning for a big water project like the New Centennial Water Source—Kaliwa Dam Project (NCWS-KDP). These are the people whose lives will be affected by the activities surrounding the construction of the dam. Directly affected are those whose dwellings are situated in the area planned for submersion. Indirectly affected are those whose homes might not be located in the area for submersion but whose livelihoods will be disrupted by the construction activities and project implementation and operations.

This is a very specific concern of the project proponents and stakeholders including LGUs where the project is situated. The LGUs would like to ensure and have the confidence that all possible ramifications of the project are properly addressed especially the plight of their constituents affected by the project. Hence, part of the approval process is the clearance coming from the LGUs where the project is located.

The approval hierarchy consists of the Regional Development Council (RDC), then the Provincial Development Councils (PDCs), and finally the municipal government units. The approval process starts from the lowest level, the LGU, then proceeds to the PDC (Rizal and Quezon in the case of NCWS-KDPP), and finally the RDC (in the case of the NCWS-KDP, Region IV-A).

**LGU Requests.** It is not easy securing these LGU endorsements as their requests are wish lists that can be categorized into several groups according to nature of the requests. Oftentimes, it includes a) LGU’s share on gross sales; b) development assistance; c) road construction; d) infrastructure projects; e) flood control and early warning system; f) employment and source of aggregates during construction; g) relocation site; h) assistance to protected families; i) royalty; j) assistance to indigenous people; and k) other requests.

**MWSS Responses.** Among the top requests is LGU’s share on gross assets which the Province of Quezon (PGQ), Municipality of General Nakar, Quezon and Brgy. Pagsangahan of General Nakar are all asking for in various modes. The PGQ also wants some development assistance for the protection, preservation, management and utilization of all water resources in Quezon. For the above two requests, the MWSS will require a submission of Program of Work for which the funds will be used and including projects that will benefit the affected LGU’s constituents.

Some of the proposed solutions of MWSS to these requests are already contained in the Land Assistance and Resettlement Program (LARP) like the requests on relocation site, assistance to project-affected families, and assistance to indigenous people.

For the requests on road construction, MWSS proposes to include this in the Proponent’s obligation or through the DPWH program. The request for flood control and early warning system is proposed by MWSS to be included in the Project’s scope of work. The request for hiring local persons for the project will likewise be endorsed to the Proponent. The requests for infrastructure projects will be endorsed to the national government or through CPF funding. Meanwhile, the MWSS denies the request of PGQ for royalty fees for use of natural resources in Quezon, adhering to a decision by the Regional Trial Court on the matter.

**Status of LGU Endorsements.** The project received conditional approval for RDC IV-A on 27 March 2014, but this is subject to two conditions: a) submission of endorsements from the Provincial Development Council of the provinces of Rizal and Quezon; and b) LGU-accepted draft MOA specifying the assistance and benefits to be provided to the affected LGUs. So far, only the Municipal Development Councils (MDC) of Baras and Teresa gave their full endorsement/approval of the project. The rest of the municipalities/cities have yet to give their full endorsement following the provision of their demands.

**Other Requirements.**

In addition, the MWSS is requested to do the following: (a) Secure i) land use permits since the project area is classified as a forest land; and ii) Protected Area Management en banc approval; (b) Consider the worst cases of flooding, earthquake and other disasters, both natural and man-made, in the project’s detailed engineering design; and (c) Provide the Regional Disaster Risk Reduction and Management Council IV-A with the Project’s Disaster Action Plan.

In response to the above requirements, the MWSS conducted a joint ground-validation survey (MWSS and PAMB) of the watershed and location of the project on April 11-18, 2016. The noted scenarios for the disaster will be considered in the Detailed Engineering Design while the Emergency Action Plan (EAP) is still being prepared.
Legacy 6

Responsibility to Society: Aid Mission to Capiz Town Victims of Yolanda

The MWSS demonstrated its societal concern through its outreach activities with our less fortunate fellowmen. The recipient of MWSS’ benevolent undertaking is the town of Sapian in the province of Capiz which was heavily damaged by the strongest typhoon in history that made land fall in November 2013 – typhoon Yolanda or Haiyan as it is known by its international name. Sapian is an idyllic coastal town of Capiz, 27 km. off Roxas City Capiz, with an area of some 10,657 hectares of land. It has 10 barangays and populated by only some 25,000 inhabitants divided into 5,000 households.

A team of selfless employees of MWSS volunteered themselves to form a team to be deployed to Sapian in response to a letter by Sapian Mayor Arthur Biñas to MWSS seeking assistance for provision of potable water to help his constituents in his devastated town of Sapian. For the period November 15-29, 2013, the team participated in the rehabilitation through the provision of free potable water using a Mobile Water Treatment Plant.

The team experienced challenging conditions in the area but were resolute on providing genuine service. It overcame obstacles such as total power blackout, no communications, no existing water supply, inadequate supply of materials, frequent move-out/set-up due to inadequate water source, no fuel available at vicinity, risky locations of operations, distant travel and averse weather conditions.

In summary the following were the routine assistance activities extended to the townsfolk:

- Source sampling.
- Camp transfer/set-up due to raw water source availability.
- Potable drinking water production from available raw water sources.
- Regular monitoring and testing of the product water quality.
- Regular monitoring and checks of the equipment performance & operations.
- Outright maintenance of observed malfunctions.
- Periodic recording of operations and testings.
- Regular monitoring of operation logistics items.
- Electric charging of drained cellphones and flashlights of residents.
- Advice to recipients on the proper handling of the stored water.
- Assistance in and monitoring of the delivery of the product water by the municipality’s single fire truck.
- Performing proper safekeeping and security of the equipment after operation.

By the end of the 15-day mission, all ten (10) barangays were served without any glitches and complaints from both giver and recipient and without any sickness and accidents incurred.
Caring for the watersheds from where it draws its raw water supply has been a long standing obligation of the MWSS. Proclamation No. 391, Series of 1968, placed the what is now known as the Ipo Watershed under the joint administration of the MWSS and the DENR. A similar proclamation was issued over the parts of the Umiray Watershed where the Umiray-Angat-Transbasin Project (UATP) is located. In 2007, Proclamation No. 1336 established the La Mesa Watershed Reservation under the joint administration of the DENR and the MWSS. Until 2010, the respective duties and responsibilities of the DENR and the MWSS in the joint administration of these watersheds were undefined and the efforts to protect the watersheds were generally uncoordinated.

From 2011 onwards, the MWSS has worked very closely with the DENR and various key stakeholders to care for and protect these watersheds and draw up the parameters of their respective obligations as joint administrators. Within the context of partnership for sustainable ecosystem services, DENR and MWSS have been crafting plans and programs that harness the technical expertise of DENR in sustainable watershed management and the financial strength of MWSS as a public utility operator.

For the La Mesa Watershed, the MWSS played an active role in the La Mesa Watershed Reservation Multi-Sectoral Management Council (LMWRMMC) to regulate the activities and adopt the 25-year Integrated Watershed Management Plan that will be implemented inside the La Mesa Watershed. The Work and Financial Investment Plans have been drawn up and are currently being reviewed for approval and implementation.

For the Ipo Watershed, MWSS and DENR started with their cooperation through watershed protection efforts. This has moved forward with the drafting of the institutional arrangements between DENR and MWSS that calls for the creation of an Ipo Watershed Management Council and its Program Management Office and the adoption of a staggered 10-year Work and Financial Plan for watershed delineation, rehabilitation, reconstruction, biodiversity management, community development, and forest protection have been working formulated and are currently being reviewed for approval and implementation.

For parts of the Umiray Watershed where the UATP and the Sumag Diversion Project are located, MWSS has provided assistance to the Local Government of General Nakar, Quezon to fund its watershed management programs. MWSS has also provided the LGU with technical support and assistance to improve their local water supply distribution system.

Prudently and efficiently contributing to the environmental sustainability of the watersheds from where MWSS draws its raw water is key to achieving long-term water security for the MWSS Service Areas.
Legacy 6
MWSS, PPPC Partnership Synergy

The Private Public Partnership Center (PPPC) facilitates monitors and acts as catalyst to fast-track the implementation of MWSS infrastructure projects. MWSS-PPPC partnership over the five year period shows significant strides of exemplary leadership, administration and management, partnership efficiency, and partner involvement.

There are three projects endorsed by the PPPC for funding by the Project Development and Monitoring Facility (PDMF) Board under the Public-Private-Partnership (PPP) approach. The BBWSP, NCWSP and the Rehabilitation, Operation, and Maintenance of the Angat Hydro-Electric Power Plant (AHEPP) Auxiliary Turbines 4 and 5, comprise 20% of the Project Development Monitoring Facility (PDMF) revolving fund. The PPPC also approved the Balara Water Hub project for technical assistance.

Considering the challenges inherent to collaboration and the time it takes to achieve measurable outcomes, one concrete and undeniable proof of MWSS-PPPC partnership is the successful award of the BBWSP and the facilitative role PPC continuously to exert in the procurement process for NCWSP. These include guidance in efficiently structuring bid documents, working with the TWG in the evaluation of prequalification documents, and providing technical, legal, advisory support to the SBAC.
A. Brought Services to the Indigenous People (IP) Communities

MWSS sources its raw water supply in the indigenous peoples’ territories in Bulacan and Quezon Provinces. MWSS is aware that it needs to meet the expectations of the affected IP communities that will be impacted by its infrastructure development projects. As a genuine gesture of goodwill, over the past five years, more than the traditional gift giving, MWSS had been periodically visiting the IP communities, to provide outreach programs, sponsor medical missions and extend resources for specific programs, e.g.

1. Donation of 2 units water tank, one for Umiray Elementary and one for Angelo elementary School. The water tanks were delivered in July 2016, in response to the request of barangay Umiray, the local host of the Sumag River Diversion Project.

2. Co-partnered with DOH in its Malaria elimination Operation Program at Gen. Nakar and Dona Remedios Trinidad. MWSS hosted DOH medical team in its survey mapping, health promotion/ advocacy campaigns in Quezon.

3. Conducted periodic outreach programs to the IP communities of the barangays in Dona Remedios Trinidad in Bulacan, by distributing food, school supplies, seeds and the like.

4. Donation of construction materials to Barangay General Nakar when its barangay and multi-purpose buildings was damaged by Typhoon Nona.

B. Implemented Responsible Relocation Program

To give way to MWSS infrastructure projects, more than 4000 informal settler families (ISFs) in Quezon City and Bulacan who are living in MWSS right-of-ways were relocated to NHA Housing sites and paid financial assistance.

C. Fun Ways to Learn About Water

MWSS hosts educational tours for students from all regions of the country. Part of the program is the “Water Trail” where students get information on the many aspects of water, along with pictures, data, maps, and an interactive center where students can give opinions and test their water knowledge.

D. General Nakar Town in the Quezon Province Receives PhP 42 million in Environmental Fund from MWSS

MWSS provided the town of General Nakar, Quezon financial assistance to fund environmental management programs/projects including watershed protection and related projects. The financial assistance was the subject of the MOA signed between MWSS and the municipality of General Nakar on 10 September 2012.

The MWSS is currently undertaking the Umiray-Angat Transbasin Project (UATP) and the Sumag Diversion Project (SRDP) both situated in Barangay Umiray which is part of General Nakar.
Legacy 7

To develop a deep respect, appreciation, and intelligent use for water and water resources; b) To make MWSS and its partners respected names in the delivery of a valuable life resource; c) to use available policy, methodology and technology in expanding the roles of all stakeholders for water security of Metro Manila

In accordance with the GOCC Act, MWSS will always be transparent in its undertakings and program developments. The essence of corporate governance is transparency through an expansive communications and knowledge management initiative.

MWSS will maintain and post for unrestricted public access information as required to be included in the MWSS transparency seal. It will be active participants in the Integrated Corporate Reporting System (ICRS) to ensure faithful performance of its mandate using the standards of good governance, transparency, accountability and responsibility. It will obtain feedback from its stakeholders namely the public, concessionaires, partner agencies, local government units and its employees on matters that may improve the performance of its service. It will educate the public on the importance of the water resource and mitigation efforts to avert water crisis.

Ultimately, the more transparent we are, the more appreciative the public is of our programs, initiatives and accomplishments.
EL NIÑO 2015

The 2015-2016 El Nino has been tagged by Pag-asa (El Nino Advisory No. 9, dated November 2015) as the worst ever comparable or even surpassing the 1997-1998 El Nino event. MWSS did not like the possibility of uncontrolled water interruptions, rationing and tankering as it assumed an active role in mitigating the effects of El Nino.

On July 2015, PAGASA issued its climate outlook for the El Niño which was predicted to last until June of 2016. Rainfall estimates for Angat Reservoir were estimated at way below normal with 40%-80% reduction in rainfall and as a result, inflow to the reservoir was also reduced. Consequently, the NWRB issued a Circular in August 24, 2015 enjoining all water utilities to prepare action plans to mitigate the effects of El Niño.

Through renewed partnership with the NWRB, NIA, NPC and other key stakeholders in Angat Reservoir, the MWSS and its Concessionaires Manila Water and Maynilad were able to manage the impact of the El Nino that affected the whole country. The El Nino that persisted in 2015 to 2016 was characterized by international weather forecasting organizations as the strongest and longest in known history. And, despite the fact that the water level in Angat Dam reached one of the lowest level since 2010 at 157.55 meters above mean sea level (amsl) in July, water supply continued for most areas at 24 hours a day at 7 seven days a week, with only a few areas affected with low water pressure.

On October 2015, Typhoon Lando helped Angat Reservoir Elevation recover about 7m, and the habagat or monsoon rains the following week raised Angat Level about 3 more meters. This gave some breathing room for water supply and irrigation, allowing NWRB to allocate 10 cms for irrigation. Domestic water supply has reduced its discharge from Angat dam due to continuous local inflow from Ipo watershed brought about by monsoon rains up to end of month and the first week of November.

![Angat Dam Water Level Projection](image)

| 2015-2016 | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Inflow (cms) | Angat | 59.6 | 67.64 | 20.36 | 28.68 | 18.29 | 5.75 | 25.34 | 9.48 | 9.189 | 8.625 | 24.28 | 62.88 | 81.98 | 77.88 | 100.8 | 115.5 |
| Umiray | 9.4 | 8.83 | 2.49 | 3.64 | 2.04 | 1.88 | 5.64 | 5.2 | 2.66 | 1.75 | 3.05 | 13.62 | 12.83 | 9.75 | 11.52 | 14.42 | 12.24 |
| Allocation (cms) | MWSS | 41 | 30 | 37 | 35 | 35 | 34 | 34 | 35 | 35 | 36 | 41 | 41 | 41 | 41 | 41 | 41 |
| NIA | 13.51 | 12.61 | 7.395 | 13.89 | 15.96 | 30.31 | 30.16 |

Reduced Allocation for MWSS
Zero Allocation for NIA
EL NIÑO 2015: A History of MWSS Participation

The level of Angat is still far from normal until Typhoon Nona passed through Central Luzon in December 2015 and raised the elevation by 9 meters forcing the Flood Forecasting and Warning System Division Office to spill water. Elevation during this time was 215.92 m, almost four meters above the prescribed 212m.

Besides the above involvement of MWSS in the TWG, the latter through its Administrator has been actively participating in various communications fora, meetings, technical work and follow-up activities on mitigating the effects of El Niño such as the following:

(a) Meeting of the Inter-Agency Technical Working Group on Angat Dam’s Operation on 3 July 2015;
(b) Technical Management Meeting hosted by NDRRMC in 20 August 2015;
(c) Crafting of the draft Administrative Order on Optimum Water Utilization;
(d) Meeting at the NEDA Pasig to present MWSS’ initiatives on water collection and conservation on 01 September 2015;
(e) Meeting in Malacañang on the roadmap for the Impact of Addressing El Niño on 4 November 2015;
(f) Initiating preparations with the concessionaires for the APEC meeting;
(g) Request for Additional Allocation with the NWRB (letters of November 9 & 24, 2015;
(h) Meeting on El Niño Updates in Malacañang on 10 December 2015.
The MWSS and the University of the Philippines - Center for Integrative Development Studies (UP-CIDS) have agreed for the latter to conduct a Customer Satisfaction Survey on MWSS’ stakeholders through the signing of a Memorandum of Agreement (MOA). There were two MOAs signed on 01 June 2016, one each for the MWSS Corporate Office (CO) and the MWSS Regulatory Office (RO). The survey is one of the commitments of both the MWSS Corporate Office and Regulatory Office in their respective 2016 Performance Targets Scorecard with the Governance Commission on GOCCs (GCG). It will provide an indication of how MWSS is perceived by its stakeholders in various areas of interface, providing valuable inputs to MWSS on improving its service delivery mechanism with its various stakeholders.

For the CO, the stakeholders covered are the following: MWSS financial creditors (e.g., ADB), National Government Agencies/GOCCs, concessionaires, lessees, local government units and water consumers. There are 100 target respondents with 40 of them coming from the water consumers.

For the RO, the objective is to determine satisfaction levels of customers they have had interface with on the aspects of handling of customer complaints and the dissemination of public information (i.e., public consultation, public dialogue and Information Caravan). The RO survey also includes an exploratory online survey on the effectiveness of the RO website.

Both surveys are targeted for completion by the end of 2016.
Legacy 7

2015 Public Information Drives of the MWSS-Regulatory Office

Background

The Metropolitan Waterworks and Sewerage System Regulatory Office (MWSS-RO) aims to accomplish the widest dissemination of the Implementing Rules and Regulations (IRRs) on customer-related issues adopted during the Third Rate Rebasing in 2013. The Public Information Drive is one of the venues where these Implementing Rules and Regulations can be well explained and propagated.

The event also aims to make the public aware of their rights and obligations as water consumers as well as to identify the pressing issues and concerns regarding water and sewerage services provided by the concessionaires.

The Public Information Drive, spearheaded by MWSS-RO’s Public Information Department in collaboration with Customer Service Regulation Area and the concerned concessionaire, is a series of public information initiatives to cover all customers of the concession areas.

Section 7, Exhibit A of the Concession Agreement stipulates that the MWSS-RO is tasked to provide Information Dissemination Program to promote awareness and ensure consumer welfare and satisfaction.

2015 Public Information Drives

The Regulatory Office conducted three Public Information Drives in 2015. Led by RO’s Public Information Department in coordination with the Customer Service Regulation Area (CSR) and Maynilad Water Services, Inc. (Maynilad), participants included water consumers, barangay heads and representatives, home-based entrepreneurs, residential owners, and tenants in Maynilad’s Business Areas as well as officials from MWSS-RO and Maynilad.

In the first half of 2015, the MWSS-RO focused on addressing the issues related to the conflicting decisions of the appeals panels of the two arbitration cases filed by the concessionaires. Examples of questions are: 1) What are the issues in the Dispute Notice of Manila Water Company, Inc. and Maynilad Water Services, Inc. 2) What is the ruling in the arbitration case between MWSS and Maynilad? 3) Can the Arbitral Award in the Maynilad case be released to the public? 4) What is MWSS-RO’s action on Maynilad’s proposed staggered implementation of the Arbitral Award? 5) What is MWSS’ action on the discrepancy between Philippine Stock Exchange (PSE) disclosure and Maynilad’s Arbitral Award?

In the second half of 2015, three public information drives were organized by the PID in coordination with the Customer Service Regulation Area. These activities aim to disseminate information on the 2013 Implementing Rules and Regulations (IRRs). The discussions focused on the following IRRs:

- IRR No. 2013-01: Revised IRR on the Disconnection and Reconnection of Water Service Connection;
- IRR No. 2013-02: IRR on Rate Classification and Billing Scheme of Small-Scale (Home-Based) Businesses; and
- IRR No. 2013-06: IRR on Additional Meter and Transfer of Connection Tapping Point.

In these public information drives on the IRRs totaling three separate events, a total of 39 issues were raised by the participants of which 37 of these issues were addressed by the MWSS-RO.

In total, the MWSS RO has answered 96% of the issues raised on its public information drive. This is more than the 90% target of the MWSS RO under its 2015 Performance Scorecard.
Legacy 7

MWSS’ Invest in Water Forum

The MWSS conducted a forum introducing the water infrastructure projects under its flagship Water Security Legacy (WSL) Program, on 10 June 2014 at the Oakwood Hotel in Ortigas, Pasig City. The forum intended to provide potential investors advance information on the salient features of the three big-ticket water infrastructure projects of MWSS (i.e., Bulacan Bulk Water Supply Project (BBWSP), New Centennial Water Source Project (NCWSP) and Angat Water Transmission Improvement Project (AWTIP)), all of which have been given approval by the NEDA Board chaired by the President and which are to undergo competitive bidding process.

The forum was well attended with about 175 participants from the private sector and some 75 representatives from government gracing the occasion. In his keynote speech, Administrator Esquivel welcomed the participants and encouraged them to become partners of MWSS in not only spurring economic growth but as well be a participant in the noble cause of ensuring water security for the residents of Metro Manila and other parts of MWSS’ service area, by investing in MWSS’ water infrastructure project/s. The Welcome Remarks was delivered by PPP Executive Director Cosette Canilao and the overview of the WSL and its components by MWSS’ Dep Administrator Bobby Cleofas.

Each project was presented to the attendees by a representative of the Transaction Advisor involved with the project followed by a Question and Answer session. The Transaction Advisors are the following: (a) For the BBWSP – IMC, Worldwide; (b) NCWSP – RebelGroup; (c) AWTIP – Halcrow. The forum ended after an informal breakout session coinciding with lunch where interested participants mingled with their tables of choice and get more information on the projects that interest them. Tables were assigned for each project, where project members/resource persons seated together with interested participants.

MWSS Website

The MWSS has undertaken a thorough makeover of its website, migrating to the platform/template required by the supervising agency in charge of information technology, the Department of Transportation and Communications, to make it more responsive to the prying needs of our the internet-using publics.

Important MWSS milestones and events are posted in the MWSS website which anybody with online capability can readily access. These information are meant not only to apprise the public of key information about MWSS but also to manifest transparency in its activities. As such, the posted information also includes MWSS publications like the Annual Reports which it has done since 2011. It also contains transparency seal documents as required by supervising agencies GCG and CSC for proper public service. The names and resumes of top officials including Board of Directors are also available for public viewing. Also posted is the Manual of Corporate Governance, which lays down the executive provisions for appropriate governance to ensure transparent, responsible and accountable operations pursuant to the requirements of Section 42 of the Code of Corporate Governance; as well as the Code of Conduct for MWSS officials and employees. MWSS has consistently published annual reports since 2011.
Role of PAWS in MWSS-RO

The Public Assessment of Water Service (PAWS) was designed to independently monitor, evaluate and report on the performance of the Concessionaires to the MWSS and other stakeholders, including the public.

PAWS is a Performance Indicator System, which utilizes three major performance categories: Network Quality, Water Quality and Service Quality. The system allows elaborating three performance ratings. The first is associated with the Consumer-Level, the second involves Service Performance Level, and the third merges the two into a combined indicator for each major performance category and for overall performance.

Primary data gathered directly by the PAWS, such as Consumer Survey and Service Performance Network Quality are used for performance measurements. Results of the PAWS are influence factors that assist the Regulatory Office in its decision-making process. It is also given to the concessionaires to provide them with valuable operational and business planning information and increase public awareness and participation in the assessment of the level of water service.

The PAWS promotes transparency, Accountability and Results-Oriented water service.

Evolution of the PAWS

The PAWS originated from the World Bank assisted Public Performance Audit (PPA) Project in 2000. Starting in 2003, the MWSS Board of Trustees approved a full scale and regular implementation of the PPA, which later on came to be known as the Public Assessment of Water Service (PAWS). The PAWS completed in 2011 its assessment of residential water services in all of the Metro Manila barangays covered by the two Concessionaires. All qualified barangays in Rizal and Cavite were also covered. Barangays sampled in previous years were revisited in the fifth year of implementation.

Performance Concerns of the Stakeholders

The customers of water service or the public in general, indicate an expectation that the delivery of water service will improve as a result of the privatization. On the other hand, the concessionaires expectedly expressed an initial concern of apprehension. However, they later on accepted the PAWS as a partnership tool and used the information to increase efficient operations of the system and improve the service they provide.

PAWS Public Information and Disclosure

PAWS assessments and other information were communicated to the different stakeholders through the following:

1. PAWS Data Viewer at the MWSS-RO
2. Barangay Roadshows
3. PAWS Information Displays in Concessionaires’ Business Areas

Operation of the PAWS

The National Engineering Center of the University of the Philippines (UP-NEC) was the Executing Agency of the PAWS, serving as the independent/third party assessor of performance, operating through a Memorandum of Agreement (MOA) with MWSS-RO.
Legacy 7

MWSS is a Founding Member of the Asia Water Council

Asia Water Council (AWC) is a global network focused on providing tangible solutions on Asian Water Challenges and facilitating multilateral discussions among stakeholders. The AWC will coordinate with stakeholders during identification and implementation of tangible solutions. The AWC is the principal organizer and sponsor of the Asia International Water Week, a forum for sharing AWC’s professional achievements as well as knowledge sharing with other professionals’ experience and networks. The AWC also creates future opportunities towards the common goal of the Asia water community. AWC’s mission is to “Achieve Sustainable Growth in Asia with Smart Water” and the vision is “Global Acknowledgement on Asian water issues and sustainable growth through resolving those issues”.

AWC is established to respond to a call for implementing solutions, specifically to Asian water challenges by hosting meaningful knowledge forums on primary agenda relating to all kinds of needs of the global water community. The council members consist of policy and financial advisors, planners, strategists, government officials, technicians, engineers, and scholars, as well as opinion leaders in the international water community who are ready to join in implementing solutions for Asian water challenges.

AWC recognized the contributions of MWSS and its water security legacy plan and as such, invited the Administrator to be a Founding Member.

<table>
<thead>
<tr>
<th>Nationality</th>
<th>Organization</th>
<th>Position</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Ministry of Water Resources</td>
<td>Minister</td>
<td>Mr. Chen Lei</td>
</tr>
<tr>
<td>France</td>
<td>Polytech Nice Sophia University</td>
<td>Professor</td>
<td>Dr. Philippe Gourbesville</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Ministry of Public Works and Housing</td>
<td>Minister</td>
<td>Dr. Ir. Basuki Hadimuljono</td>
</tr>
<tr>
<td>Japan</td>
<td>Tokyo City University</td>
<td>Professor</td>
<td>Dr. Kazumasa ITO</td>
</tr>
<tr>
<td>Korea</td>
<td>Ministry of Land, Infrastructure and Transportation</td>
<td>Minister</td>
<td>Mr. Hoin Kang</td>
</tr>
<tr>
<td>Korea</td>
<td>KOICA</td>
<td>President</td>
<td>Mr. Youngmok Kim</td>
</tr>
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<td>Korea</td>
<td>K-water</td>
<td>CEO</td>
<td>Dr. Gyewoon Choi</td>
</tr>
<tr>
<td>Laos</td>
<td>Ministry of Energy and Mines</td>
<td>Minister</td>
<td>Dr. Khamanny INTHIRATH</td>
</tr>
<tr>
<td>Mongolia</td>
<td>Ministry of Environment, Green Development and Tourism</td>
<td>Minister</td>
<td>Mr. N. Battserg</td>
</tr>
<tr>
<td>Nepal</td>
<td>Asian Development Bank</td>
<td>Former V.P.</td>
<td>Dr. Bindu N. Lohani</td>
</tr>
<tr>
<td>Singapore</td>
<td>National University of Singapore</td>
<td>Professor</td>
<td>Prof. Liong, Shie-Yui</td>
</tr>
<tr>
<td>Thailand</td>
<td>Ministry of Agriculture and Cooperatives</td>
<td>Permanent Secretary</td>
<td>Mr. Lertviroj Kowattana</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>Ministry of Agriculture and Water Resources</td>
<td>Deputy Minister</td>
<td>Mr. Shavkat Khamraev</td>
</tr>
<tr>
<td>Cambodia</td>
<td>Ministry of Water Resources and Meteorology</td>
<td>Minister</td>
<td>Mr. Lim Kean Hor</td>
</tr>
<tr>
<td>Philippines</td>
<td>Metropolitan Waterworks and Sewerage System</td>
<td>Administrator</td>
<td>Mr. Gerardo A. I. Esquivel</td>
</tr>
</tbody>
</table>

**Expected outcomes**

- Realizing SDGs
  - Lead to resolve Asian water problems linked with Sustainable Development Goals

- Building Network
  - Provide a substantive platform for all stakeholders related to water issues to share knowledge and experiences in order to tackle Asian water problems efficiently

- Boosting Water Industry
  - Encourage private sectors in water industry to be involved in implementing and applying customized appropriate feasible solutions based on technologies
FUTURE-PROOFING MWSS

The first part of this Term Report talked about the gains since 2011. It is an accurate account of the performance of MWSS as it faced the challenges of meeting water and sewerage services in a growing economy. This includes protecting the environment and the ecosystems that are vital to continue the progressive increase in the supply of water. A balance between the protection of consumers and business sustainability is likewise important in future-proofing MWSS. This second part talks about the compilation of programs and projects needed to achieve water security for Mega Manila and its outskirts. This second part talks about the compilation of programs and projects needed to achieve true water service coverage for Mega Manila and its outskirts in compliance with its mandate.

1. Angat Dam Optimization and Maintenance of Existing Systems
2. Watershed Management and Protection
3. Development of Short and Long-Term Water sources including the New Centennial Water Source Project
4. Non-revenue water, groundwater policy, demand management and utilization of water technologies (i.e. Laguna Lake)
FOUR STRATEGIES FOR CONTINUOUS AND UNINTERRUPTED WATER SUPPLY

As early as 2011, MWSS consolidated the strategies for continuous and uninterrupted water supply. There are five major strategies for the water resources infrastructure, development and protection being done by MWSS and its partner organizations.

**Strategy I: Securing and maximizing Angat Dam and all its appurtenant structures and assets**

The structural roadmap for securing and optimizing the Angat Dam was defined and is projected to be completed in the next three years.

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Project Cost</th>
<th>Status</th>
<th>Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strengthening the dam/cape &amp; auxiliary spillway to ensure structural integrity of the dam and dyke and to increase dam storage capacity</td>
<td>N/A</td>
<td>Ongoing</td>
<td>Approximately two to three years. ~ 2018</td>
</tr>
<tr>
<td>Instrumentation system improvement for flood forecasting and warning systems.</td>
<td>PhP 237.16 million</td>
<td>Ongoing</td>
<td>2017</td>
</tr>
<tr>
<td>Rehabilitation works under the Angat River Downstream Project (ARDIP) with the Provincial Government of Bulacan</td>
<td>PhP 267 Million</td>
<td>Ongoing</td>
<td>2017</td>
</tr>
<tr>
<td>Addition of 2 cms inflow to Angat Reservoir, as approved in NWRB</td>
<td>PhP 717 Million (Concession Funding)</td>
<td>Ongoing</td>
<td>2017</td>
</tr>
<tr>
<td>Rehabilitation of facilities and structures damaged by Typhoon Winnie to ensure the continuous flow of raw water from Umiray River to Angat Reservoir</td>
<td>PhP 748 Million (Concession Funding)</td>
<td>Ongoing</td>
<td>2017</td>
</tr>
<tr>
<td>ROM of Auxiliary Turbines 4 &amp; 5 that intends to increase the plant load factor (PLF) from the annual average of 21% and 19%, respectively, to 60% each. MWSS will enter into a ROM with a private proponent who will give an upfront payment 30 days from the signing of the ROM.</td>
<td>MWSS will enter into a ROM with the private proponent</td>
<td>On-going discussion between MWSS &amp; NEDA on the appropriate procurement mode.</td>
<td>2018</td>
</tr>
</tbody>
</table>

**Strategy II: Protecting the watersheds that are critical to Mega Manila’s existing and potential water sources**

There are five major watersheds namely, Umiray, Angat, Ipo, La Mesa and Marikina watersheds, that need protection and are presently managed by different government agencies. Long-term, there must be an integrated watershed management plan that should sustain the care and protection of these watersheds including the rivers and arterial channels. The protection of these watersheds is important as their environmental conditions directly impinge on the quality and amount of potable water supply to its constituents.

Below is a summary of the ongoing activities in the watersheds.

<table>
<thead>
<tr>
<th>Watershed</th>
<th>Managed By</th>
<th>Basis</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Umiray</td>
<td>DENR</td>
<td>Proclamation No. 573 (1969) as amended by Proclamation No. 264 (1993)</td>
<td>MWSS funds assistance projects to the LGU of General Nakar, Quezon for its watershed management programs.</td>
</tr>
<tr>
<td>Angat</td>
<td>NPC</td>
<td>Proclamation No. 71 (1927) as amended by Proclamation No. 505 (1965) and Proclamation No. 391 (1968)</td>
<td>NPC continues to protect this watershed and at some point must integrate its best practices with the other agencies.</td>
</tr>
<tr>
<td>Ipo</td>
<td>DENR/MWSS</td>
<td>Proclamation No. 391 (1968) placed the watershed under the joint management of DENR and MWSS</td>
<td>MWSS and DENR drafted the institutional arrangements needed for an Ipo Watershed Management Council and its Program Management Office and the adoption of a 10-year work and financial plan.</td>
</tr>
<tr>
<td>La Mesa</td>
<td>DENR/MWSS</td>
<td>Proclamation No. 1336 (2007) established the La Mesa Reservation under the joint administration of DENR and MWSS</td>
<td>MWSS participates in the La Mesa Watershed Reservation Multi-sectoral Management Council to regulate and adopt a 25-year Integrated Watershed Management Plan inside the watershed.</td>
</tr>
<tr>
<td>Marikina</td>
<td>DENR</td>
<td>Proclamation No. 2480 (1996) with an area of 4.423 hectares are MWSS resettlement areas for project affected families, and Proclamation No. 296 (2011)</td>
<td>Plans still need to be defined.</td>
</tr>
</tbody>
</table>

In addition, as we target the construction of the Kaliwa Dam, programs with the LGUs in General Nakar and Infanta, Quezon must be initiated to protect the Kaliwa watershed.

MWSS initiated standardization methods for all watersheds to measure the success of reforestation using the latest technologies like Lidar mapping.
Legacy 1

Strategy III: Developing short and long term water supply source in the Kaliwa-Kanan River Basins and the New Centennial Water Source Project

MWSS sources 95.6% of its total water supply from the Angat and Umiray Rivers and 4% from the Laguna Lake. The remaining supply, 0.4%, comes from groundwater sources.

While the Angat Reservoir seems to be sufficient with its capacity to cover the water requirement of the current population including the near future, the Angat Dam/Reservoir also services the irrigation requirements of the Provinces of Bulacan and Pampanga. Droughts brought by perennial El Nino and decreasing effective reservoir capacity due to the heavy siltation have sometimes given limits for water supply requirements of Metro Manila then irrigation requirements in Bulacan and Pampanga provinces.

The water supply for Metro Manila must be secured thorough additional water sources. MWSS needs to reduce its dependency on the Angat Dam. Additional water sources for Metro Manila are ongoing such as the, New Centennial Water Source - Kaliwa Dam Project of MWSS, Laguna Lake of Manila Water, Putatan of Maynilad, and Sumag Diversion Project, are ongoing, which collectively will take two to seven years to complete. However, a concrete set of water resource development as well as supply infrastructure must be ready for immediate implementation to meet the future demands of Mega Manila.

The objective is to provide alternative water sources as early as possible in the planning horizon. In the development of the roadmap for redundant and additional water sources to the Angat Dam, MWSS used the 2011 water demand study of the University of the Philippines National Engineering Center (UP-NEC) for both the East and the West zones. This study introduced major enhancements compared to previous studies such that it delved into an assessment of municipal level usage to establish average per capita water usage for each of the East and West zones, capturing their operational and economic differences.

Results showed that unlike past studies which utilized an LPCD (liters per capita-day) of 160-180 following international averages, both the East and West zones had much lower LPCD’s at 150 and 126 respectively (and later in the period, 132 liters for Maynilad). The new assumptions drastically drove down overall billed volume (demand) given the 2007 population figures in the first 10 years of the planning horizon, but demand catches up again, though still only up to 89% of the level of the extension term forecast, in the last 5 years to 2037. The catch-up occurs due to the assumptions tracking projected spatial demand when undeveloped areas today approach their full future development potential. This is an assumption worth further study since the shift tends to push volumes in hockey stick fashion in the last 5 years. Hence, from a requirement of only 500 MLD in the first 12 years, another 1,800 MLD is suddenly required over the last 5 years.

At this demand forecast, non-revenue water (NRW) for Manila Water was maintained at 12% which is the current level, or an annual average of 260 MLD. On the other hand, Maynilad’s is assumed to improve from about 35% today to 20%, in about 10 years or 2022. This translates to an average of 400MLD annually.

The MWSS Board of Trustees approved (MWSS Board Resolution No. 2013-098-CO) using the water demand study and a water source infrastructure roadmap and a combination of MWSS and concessionaire led projects (See below).

Water Security Infrastructure Roadmap 2016 –2037
Basis: UP-NEC Study in 2011

BR #2013-098-CO (Water Security Infrastructure Roadmap)

<table>
<thead>
<tr>
<th>Supply Source</th>
<th>Year Available</th>
<th>Additional MLD</th>
<th>Total MLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angat, Putatan 1</td>
<td>2015</td>
<td>4,132</td>
<td></td>
</tr>
<tr>
<td>4cms-UATP &amp; Sumag</td>
<td>2015</td>
<td>345</td>
<td>4,477</td>
</tr>
<tr>
<td>Laguna Lake (MWCl)</td>
<td>2017</td>
<td>50</td>
<td>4,527</td>
</tr>
<tr>
<td>Putatan Expansion (MWSt)</td>
<td>2017</td>
<td>100</td>
<td>4,627</td>
</tr>
<tr>
<td>Kalarin Dam</td>
<td>2020</td>
<td>600</td>
<td>5,227</td>
</tr>
<tr>
<td>Laban Dam</td>
<td>2027</td>
<td>1,800</td>
<td>7,027</td>
</tr>
<tr>
<td>Long-term sources:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agos Dam</td>
<td>2020</td>
<td>3,000</td>
<td></td>
</tr>
<tr>
<td>Kalarin Dam</td>
<td>2020</td>
<td>3,310</td>
<td></td>
</tr>
</tbody>
</table>

72
International levels were assessed for the level of redundant capacity to be provided for the whole system. Options applied to billed volume or total demand was considered. In the end, a 15% buffer on billed volume for Manila Water was applied, while a 15-25% buffer was assumed for Maynilad, while NRW levels were above world-class standards, then was decreased to 15% of billed volume, following Manila Water’s assumption, once world-class standards of 20% NRW levels are achieved.

There is some balancing required on the assumption for the buffer as the levels assumed drive an earlier need for the water source and its succeeding expansions. This may prove too taxing on tariffs. Imputung buffer to demand, the requirement for water supply over and above billed volume is about 3,200 MLD in total – which will mean delivering another dam almost the size of Angat. Again caution is required in acceptance of the numbers in the last five years of the concession period since these are driven by the shift to spatial assumptions in the projections for this period. Furthermore, with the assumed demand with buffer levels, the earliest requirement for increased capacity is in 2017 more or less, with the East Zone water supply system already unable to meet buffer requirements as early as 2015.

The assumptions for the demand projections are now being reviewed in preparation for Rate-rebasings 2017.

Water Security Infrastructure Roadmap 2016 –2037
Basis: UP-NEC Study in 2011
Supplementary Projection (with 15% buffer)

![Supply-Demand Projection (with 15% buffer)](image)

### Supply-Demand Projection

<table>
<thead>
<tr>
<th>Year Available</th>
<th>Additional MLD</th>
<th>Total MLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angat, Putatun 1</td>
<td>2013</td>
<td>4,132</td>
</tr>
<tr>
<td>Laguna Lake (MWCL)</td>
<td>2017</td>
<td>50</td>
</tr>
<tr>
<td>Laguna Lake (MWCL)</td>
<td>2018</td>
<td>50</td>
</tr>
<tr>
<td>Putatan Expansion (MWSI)</td>
<td>2018</td>
<td>100</td>
</tr>
<tr>
<td>Kaliwa Dam</td>
<td>2022</td>
<td>600</td>
</tr>
<tr>
<td>Laiben Dam</td>
<td>2027</td>
<td>1,800</td>
</tr>
</tbody>
</table>

### Long-term sources:
- Agos Dam
- Kanam Dam

#### SUPPLY-DEMAND PROJECTION

<table>
<thead>
<tr>
<th>Year</th>
<th>Existing Supply MLD</th>
<th>DEMAND (MLD)</th>
<th>SURPLUS/DEFICIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>without buffer</td>
<td>with buffer</td>
<td>without buffer</td>
</tr>
<tr>
<td>2013</td>
<td>4.132</td>
<td>3,470</td>
<td>3,560</td>
</tr>
<tr>
<td>2014</td>
<td>4.132</td>
<td>5,524</td>
<td>4,652</td>
</tr>
<tr>
<td>2015</td>
<td>4.132</td>
<td>5,574</td>
<td>4,110</td>
</tr>
<tr>
<td>2016</td>
<td>4.132</td>
<td>3,462</td>
<td>4,169</td>
</tr>
<tr>
<td>2017</td>
<td>4.132</td>
<td>3,716</td>
<td>4,096</td>
</tr>
<tr>
<td>2018</td>
<td>4.132</td>
<td>2,833</td>
<td>4,027</td>
</tr>
<tr>
<td>2019</td>
<td>4.132</td>
<td>3,832</td>
<td>4,102</td>
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<tr>
<td>2020</td>
<td>4.132</td>
<td>4,041</td>
<td>4,547</td>
</tr>
<tr>
<td>2021</td>
<td>4.132</td>
<td>4,130</td>
<td>4,766</td>
</tr>
<tr>
<td>2022</td>
<td>4.132</td>
<td>4,242</td>
<td>4,879</td>
</tr>
<tr>
<td>2023</td>
<td>4.132</td>
<td>4,398</td>
<td>5,046</td>
</tr>
<tr>
<td>2024</td>
<td>4.132</td>
<td>4,530</td>
<td>5,217</td>
</tr>
<tr>
<td>2025</td>
<td>4.132</td>
<td>4,689</td>
<td>5,362</td>
</tr>
<tr>
<td>2026</td>
<td>4.132</td>
<td>4,641</td>
<td>5,349</td>
</tr>
<tr>
<td>2027</td>
<td>4.132</td>
<td>4,898</td>
<td>5,736</td>
</tr>
<tr>
<td>2028</td>
<td>4.132</td>
<td>5,110</td>
<td>6,000</td>
</tr>
<tr>
<td>2029</td>
<td>4.132</td>
<td>5,273</td>
<td>6,402</td>
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<tr>
<td>2030</td>
<td>4.132</td>
<td>5,420</td>
<td>6,233</td>
</tr>
<tr>
<td>2031</td>
<td>4.132</td>
<td>5,580</td>
<td>6,417</td>
</tr>
<tr>
<td>2032</td>
<td>4.132</td>
<td>5,733</td>
<td>6,581</td>
</tr>
<tr>
<td>2033</td>
<td>4.132</td>
<td>5,980</td>
<td>6,773</td>
</tr>
<tr>
<td>2034</td>
<td>4.132</td>
<td>6,036</td>
<td>6,964</td>
</tr>
<tr>
<td>2035</td>
<td>4.132</td>
<td>6,136</td>
<td>7,208</td>
</tr>
<tr>
<td>2036</td>
<td>4.132</td>
<td>6,282</td>
<td>7,726</td>
</tr>
<tr>
<td>2037</td>
<td>4.132</td>
<td>6,412</td>
<td>7,274</td>
</tr>
</tbody>
</table>

& beyond
**Legacy 1**

**Strategy IV: Reducing Non Revenue Water, Managing Groundwater and Exploring New Water Technologies**

**NRW Reduction**

An ongoing and continuing program is the reduction of non-revenue water discussed in Legacy No. 3 or Water Distribution Efficiency. The strategy is part and parcel of a complementation of water sources and the maximization of the capability of existing assets to bring water into the main network, and subsequently to households and industrial/commercial users.

**Groundwater Management**

MWSS together with its concessionaires work with the local governments for the disallowance of the use of groundwater. Current deep wells are experiencing saline intrusion due to overuse. The wells need to be rested in order to allow natural replenishment. The replenishment of groundwater may be used in extreme conditions like El Nino.

There is still some challenge around working with local governments in strict enforcement of the moratorium in certain areas. On the part of NRW reduction however, programs are more definite in policy and implementation timelines.

**NRW Status and Groundwater Sources**

![Graph showing NRW Status and Groundwater Sources](image)

**New Water Technologies**

MWSS and the concessionaires lead in the exploration of and experimentation of water technologies like desalination and reverse osmosis which is presently being used in treatment plants in Laguna Lake.

Desalination is used in countries with scarce water resources. Israel and other countries in the Middle East and other parts of the world employ such technologies widely. In the long run, it may potentially be applied in selected areas for Metro Manila and its outskirts where more accessible saline or highly polluted water sources may be tapped, and, due to the proximity to the service areas, lower distribution costs can help offset treatment costs to help yield non–prohibitive overall costs.

Laguna Lake remains to be a viable water source and the use of technology is integral to harness a substantial volume of potable water.

It is MWSS’ objective to pursue its own exposure, on the job research and training to facilitate better understanding of such technologies. The new design and requirements of the approved MWSS reorganization will ensure that knowledge in this area is pursued.
IMPLEMENT THE WATER SECURITY INFRASTRUCTURE ROADMAP

Water resources infrastructure development, management and protection has been a major effort in the past years. Discussed earlier were the Angat Dam/Dyke Strengthening Project, Angat Optimization Projects, the Sumag Diversion Project, the Umiray-Angat Transbasin Project, and the Kaliwa Dam.

Guided by the Water Security Infrastructure Roadmap approved by the MWSS Board to Trustees, brief descriptions of existing and future projects are summarized below.

<table>
<thead>
<tr>
<th>BR #2013-098-CO (Water Security Infrastructure Roadmap)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supply Source</strong></td>
</tr>
<tr>
<td>Angat; Putatan 1</td>
</tr>
<tr>
<td>4cms-UATP &amp; Sumag</td>
</tr>
<tr>
<td>Laguna Lake (MWCl)</td>
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<td>Putatan Expansion (MWSI)</td>
</tr>
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<td>Kaliwa Dam</td>
</tr>
<tr>
<td>Laiban Dam</td>
</tr>
<tr>
<td><strong>Long-term sources:</strong></td>
</tr>
<tr>
<td>Agos Dam</td>
</tr>
<tr>
<td>Kanan Dam</td>
</tr>
</tbody>
</table>

**Complete the 300 MLD Laguna Lake Water Bulk Water Supply Project in 2018**

Laguna Lake’s present water uses encompass the following: lake fishery, navigation (transport route), flood water reservoir, power generation, recreation, irrigation, industrial cooling, waste sink and now source of potable water.

There is conflicting resource use competition in Laguna Lake. The surrounding mixed land uses contribute to the progressive water quality deterioration of lake water thus again increasing the cost of water production to meet the PNSDW standards. For Laguna Lake to sustain its capability to supply raw water for domestic use purpose, investments on water quality improvement projects coupled with strong enforcement of the law is needed to improve the lake’s water quality.

Laguna Lake is being regulated and managed by Laguna Lake Development Authority (LLDA) as per Republic Act No. 4850. Challenges beset the 300 MLD Laguna Lake Bulk Water Supply Project as a result of the degradation of water quality of the lake such as:

- Increase erosion and sedimentation from tributary rivers;
- Pollution from agro-industries through tributary rivers;
- Pollution from domestic and industrial wastes through tributary rivers;
- Pollution from unregulated unregistered agro-industries;
- Excessive feeds in fish cages; and,
- Saltwater intrusion.

Nevertheless, the project proceeds and the 300 MLD water abstraction from the Laguna Lake is done in phases.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
<th>Capacity (MLD)</th>
<th>Managed By</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100 MLD Water Treatment Plant (WTP), Putatan, Muntinlupa City is designed to produce potable water using microfiltration and reverse osmosis process when the total dissolved solids in the raw water exceed 500 parts per million.</td>
<td>100</td>
<td>Maynilad</td>
<td>Operational since 2010 but still need to resolve turbidity, presence of ammonia and manganese problem</td>
</tr>
<tr>
<td>1a</td>
<td>Ammonia mitigation of existing 100 MLD Putatan WTP increases capacity by 50 MLD.</td>
<td>50</td>
<td>Maynilad</td>
<td></td>
</tr>
<tr>
<td>1b</td>
<td>Upstream process improvement of existing 100 MLD Putatan WTP increases capacity by 50 MLD.</td>
<td>50</td>
<td>Maynilad</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Rizal Province Water Supply Improvement Project (RPWSIP) will directly abstract and process water coming from Laguna de Bay to initially provide 50 MLD (potential up to 100 MLD) of potable water. It will serve the municipalities of Binangongan, Cardona, Morong, Batas, Tanay, Pililia and Jala-jala.</td>
<td>100</td>
<td>Manila Water</td>
<td>Operational by 2018</td>
</tr>
</tbody>
</table>
Legacy 1

Operate the Laiban Dam by 2027

The feasibility study and detailed engineering design for the Laiban Dam Project were already completed in the 1980s. This included the construction of the diversion tunnels. During this period, some affected families were already compensated for their above-ground improvements and in fact, several titled properties were also acquired. However, this project including the complete relocation of affected families was deferred in 1989 in lieu of equally important projects, the Angat Water Supply Optimization Project (AWSOP) and the Umiray-Angat Transbasin Project (UATP).

After several reviews and updates and a Presidential Memorandum Order No. 10 dated 5 August 1998 issued by President Joseph Estrada mandating MWSS to immediately resume the implementation of the Laiban Dam Project, it was approved by the NEDA-ICC in April 2007 with a total cost of PhP 48 billion to be funded under a China loan. However, in the Joint NEDA Cabinet Group and Procurement Transparency Group meeting held in 9 February 2008, MWSS was instructed to cancel the Laiban Dam and focus instead on the implementation of the Angat Water Utilization Improvement Project (AWUAIP) Phase 2.

Due to a water supply deficit for Metro Manila and the continuing issue of a single water supply for Metro Manila, the Angat Dam, MWSS pursued the Laiban Dam through another mode of procurement. However, a joint venture arrangement scheme promulgated by NEDA, with the San Miguel Bulk Water Company Incorporated failed putting the project to a stop.

In 2011, when the Water Security Legacy Project was launched by MWSS, it included the New Centennial Water Source Project which is actually an integrated system consisting of the Kaliwa Dam (now the NCWS-KDP) and the Laiban Dam with a hydropower component. However, given the right-of-way and social acceptability risks of the Laiban Dam and upon recommendation of NEDA, MWSS opted to undertake the integrated dam in two phases. The first is the NCWS-KDP followed by the Laiban Dam.

Based on the feasibility studies and detailed engineering designs of 2014, the integrated dam system which includes the construction of Kaliwa 50m Dam and Laiban Dam will generate a combined additional 2400 MLD to ensure water security for Metro Manila and a hydro-power component generating 13.9MW. Laiban is the only remaining nearest surface water source for Metro Manila. Major preparatory works were completed, 1) River diversion tunnels, twin 9 meters x 500 meters long concrete-lined tunnel was constructed in 1984, 2) Partial acquisition of affected titled lands was done, and 3) Integrated dam system study was completed in 2014.

The NCWS-KDP is expected to be awarded in 2017 with construction to be completed in seven years, in 2023. As such, and given the length of time it takes to complete and secure approval for a dam infrastructure project, the review of the 2014 feasibility study should commence after the NCWS-KDP is awarded. Also, once the Laiban Dam is approved by NEDA, the land acquisition and resettlement plan will require thorough planning and execution before the actual dam construction.
**Validate Agos Dam as a Long-range Water Source**

The catchment areas for Agos Dam River project resemble the combined characteristics of catchment areas for Kaliwa River and Kanan River basins. The Kanan catchment area is expected to deliver better quality of water compared with water from Kaliwa River Basin. Overall, considering the land cover and existing land uses in the Kaliwa and Kanan River Basins, Agos Dam Project is expected to provide the much needed water supply in the MWSS Service Area.

The Agos Dam site is located just downstream of the confluence of Kanan and Kaliwa Rivers, about 20 km upstream of the river mouth of Agos River. The proposed Dam is located in General Nakar, Province of Quezon. The dam is a concrete-face rockfill dam (CFRD).

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**Validate the Kanan Dam as a Long-range Water Source**

Kanan Dam projects are to be located in Kanan River Basin. Majority of the land cover is comprised of closed forest broadleaved and a little share of open forest broadleaved. The area is also void of built areas except for the nomadic habitation of IPs. Among all the identified new water sources, Kanan River Basin can be considered as the most ideal water source from the watershed conditions due to its rich and intact forest cover.
Finalize Procurement: Consulting Services for the Review of Detailed Engineering Design (DED) and Construction Management of the BBWSP

The Consulting Services ("Consultant") will provide contract management services to MWSS, which include among others the supervision and monitoring during the (a) pre-construction period, (b) construction period, and (c) testing and commissioning of Stages 1 & 2. The procurement is currently being undertaken in accordance with the provisions of the Government Procurement Reform Act, RA-9184.

Specifically, the consultant will:

1. Supervise and monitor the implementation of the Project in coordination with the BBWSP-Project Management Office (BBWSP-PMO).

2. Provide advice to MWSS in effectively and efficiently managing the contract, and in the event of delay or non-compliance by the Concessionaire with respect to its obligations or undertakings, and recommend the appropriate actions or remedies available under the Concession Agreement.

3. During pre-construction period, review, provide comments, and recommend, through the BBWSP-PMO for approval by the MWSS, all the detailed engineering design (DED) outputs of the Concessionaire;

4. During construction and commissioning period, carry out the day-to-day monitoring and supervision of all construction activities, including commissioning and acceptance, as the MWSS’ Works Engineer on site.

5. Prepare a Commissioning and Acceptance Standards, and certify the correctness and acceptability of the Concessionaire’s Operations & Maintenance Manual.

6. Be responsible and accountable to the MWSS for all its actions and recommendations in connection with the implementation of the Project.

The Consultant is expected to work in close coordination with the BBWSP-PMO and concerned water districts and/or their designated representative/s during the entire period of engagement.

The Contract Duration is 26 months from issuance NTP.

Initiate Creation of the BBWSP Contract Management Unit (CMU) in MWSS

CMU is the unit to be created by MWSS within the Corporate Office to manage and regulate the Concession Agreement (CA) with the Concessionaire, Luzon Clean Water Development Corporation, and monitor its performance of its rights and obligations thereunder. The CMU will be comprised of individuals with technical, legal, financial and project management skills as MWSS may determine. Additional expertise will be brought in to supplement expertise on an “as needed basis”. The costs and expenses for the creation and maintenance of the CMU and the performance by its members and representatives of CMU’s functions shall be for the account of MWSS. The CMU’s powers and authority are purely recommendatory. All issuances and decisions of the CMU shall be subject to the approval, action, or direction by the MWSS board.

Among the functions of the CMU’s as included in the CA are:

A. Sec. 16.2.a - The CMU shall compute the annual Consumer Price Index (CPI) Adjustment on bulk water charge (BWC) following the operation start date and present the same for approval by the MWSS Board.

B. Sec. 16.2.b - The CMU shall review the updated business plan, to be submitted by the Concessionaire on the 8th anniversary of the Signing Date, and subsequently conduct a one-time BWC rebasing for Stage 3 on the 12th anniversary of the signing date. The CMU shall determine the adjusted BWC using the original past cash flows covering Stages 1 and 2 from start of operation until the time of rebasing, and updated future cash flows covering Stages 1, 2 and 3 from the time of rebasing onwards until the end of the concession period.
Transfer Water Rights from the National Irrigation Administration to Secure Additional Water Supply from Angat

Initiate the transfer from National Irrigation Administration an additional 7.5 CMS water rights. This will secure 7/5 CMS more of water supply from the Angat Dam for the use of Mega Manila.

NWRB will conduct a needs assessment to update the water requirements of NIA and MWSS from the Angat Reservoir. An initial 7.5 CMS was

Conduct a Feasibility Study for IPO Dam 3

Ipo Dam’s primary function is a diversion dam, hence every time extreme rainfall occurs, excess water is discharged downstream of the dam. Due to this, Bulacan LGUs are pushing that the water elevation at Ipo Dam be lowered down to minimize its impact downstream. However, this would also mean that MWSS would not be able to get its full water allocation for that particular period. To remedy the situation, a water harvesting dam (Ipo Dam 3) is proposed to catch the spilled water and maintain the operation of Ipo Dam at high level. Stored water can also be used for Bulacan as a partial replacement of the 15 cms previous reallocation from NIA.

The feasibility study for this project still needs to be initiated by the MWSS.

Initiate the Installation of Flow Meters

Water allocation to domestic water supply passes thru Auxiliary turbines 1 to 5 of the Angat Hydro Electric Power Plant (AHEPP), the bypass 4 and 5, or the spillway. All these outlets go thru the tailrace then to Angat river down to Ipo Dam where it is diverted to the tunnels. The flows are measured indirectly by, turbine power output and valve or gate openings of the bypass or spillway. These measures are inaccurate due to variation of flows with respect to elevation. Water flow meters have been installed in strategic locations from source to the treatment plants. One is already operational at the La Mesa Portal where the two concessionaires split their water shares. This can also be used to check if MWSS is diverting water within its approved allocation. Once the full system is in place, it would easy to check for leaks and losses in the system. This will also help manage the diversion of water making the use of allocated water more efficient.

Conduct Regular Bathymetric Survey

The reservoir capacity of Angat, Ipo and La Mesa are vital to the water supply operations of MWSS. The volume available to these reservoirs is a key factor in the allocation of water supply for domestic use. Due to siltation, reservoir volume capacity deceases over the years. Bathymetric data shows this capacity and relates it to the elevation of the reservoir. The last Bathymetric survey of Angat Reservoir done by the National Power Corporation was in 2008 and the total volume calculated was at 850 Million cubic meters at elevation 217 meters. It also indicates that some silt levels reached elevation 120. In that case, it is imperative that a bathymetric survey be conducted to confirm the exact elevation of the silt at the intake of the low level outlet which is at elevation 101. This low level outlet is used for emergency purposes when the dam elevation is lower than 160 meters.

Ipo dam diverts water from the Angat River to the tunnel going to Bicti in Norzagaray, Bulacan. These tunnels then connect to aqueducts going to La Mesa dam. If silt levels reach the tunnel intakes, it will affect the flow capacity of the tunnels. Bathymetric survey will show the levels of silt in the reservoir. La Mesa reservoir is also affected by siltation, some of the intake valves are already under silt which reduces its capacity to take in water going to Balara Treatment plants. The reservoir capacity should also be validated since it is the only alternative source to Angat.
Complete Fencing of MWSS Right of Ways

The Fencing of the MWSS Right of Ways (ROWs) is an important project that will protect the water conveyance facilities. These ROWs are usually the targets of intrusion or usurpation of Informal Family Settlers [IFS], unauthorized settlers and/or cultivators. Therefore, it is imperative to protect, maintain and secure these properties through the relocation of the IFS and installation of fences to be guarded 24 hours.

There are two ROWs fencing projects, managed by the concessionaires, that need immediate attention such as the 1) Fencing of the La Mesa Watershed Perimeter Fence that Fence needs immediate rehabilitation for the damaged perimeter fence to prevent intrusion of unauthorized persons and illegal settlers to enter the said watershed Wall and 2) Bigte to Novaliches ROW Fencing that will secure and ensure the reliability, safety and security of the raw water conveyance and prevent re-entry of evicted informal settlers, illegal tapping of the aqueduct.

<table>
<thead>
<tr>
<th>Area</th>
<th>Phase</th>
<th>Length (kms)</th>
<th>Inclusions</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bigte to Novaliches Aqueduct (BNAQ) ROW</td>
<td>1</td>
<td>5.846</td>
<td>*Camella Homes *Victoria Wave to St. Paul Ext *St. Joseph to Vicente Christopher St.</td>
<td>Remaining works is 2.35 kms for Phase 1.</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>6.10 per side</td>
<td>*Bigte Basin to Brgy Kaypian (Camella Homes)</td>
<td>Jul'16: Design stage done</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.55 per side</td>
<td>*Brgy Kaypian to Camella Homes</td>
<td>Jul'16 to Oct'16: Procurement done</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Q4'16 to Q3'17: Construction stage</td>
</tr>
<tr>
<td>La Mesa Watershed</td>
<td>3</td>
<td>2.161</td>
<td>*All</td>
<td>Aug'16, 3rd wk: Design stage done</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Aug'16, 4th wk to Oct'16, 2nd wk : Procurement done</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Oct'16 to Jun'17: Construction stage</td>
</tr>
</tbody>
</table>

Phases 1 and 2 Fencing Project

Phase 3 Fencing Project
Legacy 2

TUNNEL REHABILITATION AND IMPROVEMENT PROJECTS

The raw water released from the Angat Dam is stored by two regulation dams, namely Ipo Dam and Bustos Dam. The raw water supply for the MWSS service area is from the Ipo Dam while the irrigation water supply for AMRIS is made through the Bustos Dam. Presently, the raw water from the Ipo Dam is conveyed through three tunnels (Tunnels 1, 2, 3) to the Bicti Basin (interconnection structure) and further to La Mesa Reservoir through six raw water aqueducts as shown in Figure 1. A part of the raw water from La Mesa Reservoir flows into the La Mesa Treatment Plants and finally connected to the west zone distribution system for the service area of Maynilad. The rest goes to the Balara Treatment Plants and finally connected to east zone distribution system for the service area of the Manila Water.

Important to the water security is the commencement of rehabilitation of the tunnels and the aqueducts.

Rehabilitate Old Tunnels

An assessment report issued by on the Rehabilitation/Renewal Study of Raw Water Conveyance to Angat conducted by Halcrow in 2013. The potential rehabilitation work for each conveyance is shown in the Table below. However, this will need full prioritization and optioneering of alternatives after detailed inspection.

Aqueducts 1 and 2, the oldest of the conveyance systems, should be replaced soon after the construction of the Angat Water Transmission Improvement System (AWTIP), as redundant systems in support of the Water Security Legacy Program.

Tunnel 3 supplies AQ6. The support system for the Tunnel 3 is mainly rockbolts and shotcrete. It is likely that the rockbolts will have corroded and be at, or near, the end of their useful life. At this stage, it is envisaged that cast in situ concrete lining is the most likely remedial measure. Other options could be installation of new double corrosion protection anchors with additional shotcrete; or a combination of the two. It is likely that any rehabilitation solution will lead to a reduction in the hydraulic capacity.

Tunnel 2 and AQ4 are the next most important conveyances for inspection and remediation. It is anticipated that Tunnel 2, which is thought to be concrete-lined (the derived hydraulic parameters reinforce this conclusion), will need some local repair work only, while AQ4 may well need local repairs in the tunnel sections and major rehabilitation of the precast pipes section. Solutions with the aim of reducing leakage and improving seismic resistance of the pipe could range from joint repair, through lining to complete pipe replacement. It is possible that this work will result in an increase in capacity through a reduction in hydraulic roughness. All fittings and associated structures will need to be put in order.

Tunnel 1 and AQ3 are retained to provide additional flexibility during maintenance, but not used during normal operation. In this case, only works essential to their integrity will need to be carried out.

Table of Prioritization for Potential Rehabilitation of MWSS’ Conveyance Systems

<table>
<thead>
<tr>
<th>Priority</th>
<th>Conveyance</th>
<th>Constructed</th>
<th>Length</th>
<th>Tunnel Section</th>
<th>Pipeline Section</th>
<th>Issues</th>
<th>Potential Rehab Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aqueduct 1-2</td>
<td>1939 AQ1 1948 AQ2</td>
<td>15.45km (8.15km pipe, 7.3km tunnel)</td>
<td>Horseshoe 2.04x2.19 assumed as Tunnel 1</td>
<td>In situ concrete 1.55m diameter</td>
<td>77yr old AQ1 &amp; 68yr old AQ2, leakage at 6%, fittings generally not serviceable</td>
<td>Full replacement</td>
</tr>
<tr>
<td>2</td>
<td>Tunnel 3</td>
<td>1992</td>
<td>15.36km (9.23 km pipe, 6.13km tunnel)</td>
<td>Horseshoe 4.4x4.35 shotcrete lined</td>
<td>Critical tunnel, no permanent concrete lining, rockbolts 24yr old</td>
<td>Permanent concrete lining -locally or total length, use corrosion resistant rockbolts + additional shotcrete</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Aqueduct 4</td>
<td>1969 1983</td>
<td>15.36km (9.23 km pipe, 6.13km tunnel)</td>
<td>Horseshoe 3.0x3.0 concrete lined</td>
<td>Circular 3.4m diameter, concrete lined</td>
<td>Important tunnel, 47yrs old</td>
<td>Optioneered repairs to concrete lining</td>
</tr>
<tr>
<td></td>
<td>Tunnel 1</td>
<td>1939</td>
<td>15.2km (9.46 km pipe, 5.74km tunnel)</td>
<td>Horseshoe 2.04x2.19 concrete wall + floor</td>
<td>In situ concrete 2.9m diameter</td>
<td>77yr old tunnel</td>
<td>Additional lining, lining repair to maintain integrity</td>
</tr>
<tr>
<td>5</td>
<td>Aqueduct 3</td>
<td>1969</td>
<td>15.2km (9.46 km pipe, 5.74km tunnel)</td>
<td>Horseshoe 2.7x2.7 concrete lined</td>
<td>In situ concrete 2.9m diameter</td>
<td>47yr old, leakage at 10%</td>
<td>Repairs to concrete, replace essential fittings for emergency operations</td>
</tr>
</tbody>
</table>
Complete Procurement of Consultants for the Angat Water Transmission Improvement Project (AWTIP)

The procurement of consultants for the review of the detailed engineering design and construction supervision for the Angat Water Transmission Improvement Project (AWTIP) was necessary as it was a provision in the terms and conditions of the Asian Development Bank (ADB) loan.

In this regard, on 18 April 2016, deadline for submission of Expression of Interests, eighteen (18) firms submitted the required documents for shortlisting. On 02 June 2016, the Technical Working Group (TWG) submitted its Evaluation Report of Shortlisting for Consultancy Services, which was approved and adopted by the Bids and Awards Committee (BAC). The BAC and the TWG found and recommended that six (6) of the eighteen (18) prospective bidders may be shortlisted. On 09 June 2016, the MWSS Board of Trustees (BOT) upon the recommendation of the Management and the BAC, approved the Report of the Evaluation of Shortlisting for Consultancy Services for AWTIP, subject to ADB’s review and approval, in accordance with ADB’s Procurement Guidelines and the Consulting Services Guidelines.
The drivers for the sewerage and sanitation programs are 1) Improvement of health and sanitation conditions through environmental preservation, 2) Concession Agreement between MWSS and its two concessionaires and the Term Extension Plan, 3) Republic Act No. 9275 Clean Water Act 2004, and 4) Supreme Court Decision (18 December 2008) to Clean-up and Rehabilitate Manila Bay.

The Term Extension Plan approved by the MWSS is a tariff mitigation mechanism. The recent Supreme Court ruling on the Manila Bay Clean Up and the Department of Environment and Natural Resources (DENR) directive to accelerate the implementation of the wastewater master plan will entail major capital spending and significantly affect current water rates considering the already limited period by which investments can be recovered. In effect, the Term Extension will ultimately benefit existing and future customers by way of reliable and sustainable services and more affordable water rates with 100% sanitation and sewerage coverage.

Diagram of Sewerage and Sanitation Roadmap Leading to 100% Coverage

Diagram of the East Zone Sewerage Master Plan

Diagram of the West Zone Wastewater Master Plan
Prepare Groundwork for Rate-rebasing 2017

The MWSS Regulatory Office (MWSS RO) is mandated to conduct a Rate Rebasing (RR) exercise every five years pursuant to the Concession Agreement. RR is a periodic performance review and general tariff adjustment that sets the maximum rates the Concessionaires may charge. In RR, MWSS RO is tasked to determine an appropriate level of tariff that will permit the Concessionaires to recover the past expenditures, represented by the Opening Cash Position (OCP), net future expenditures, and the cost of money, on the one hand, from projected future receipts applying the new rates, on the other hand. This is done by calculating the “Net Present Value” of OCP and Future Cash Flows as contained in Concessionaires’ March 2017 Business Plans. The rate adjustment of “R” is then derived by dividing the future receipts (from the rate) by the future billed volume.

This formula entails a number of major tasks which include, among others: an evaluation of the Concessionaires’ Business Plans; an examination of each Concessionaire’s cash position, expenditures, revenues and receipts; a determination of the Appropriate Discount Rate (ADR); an assessment of the past and future service obligation targets; and an evaluation of future capital and operating expenditures.

Initiatives of the Regulatory Office

A. RO is initiating necessary steps in preparation for the fourth RR.

1. Capital Expenditure (CAPEX) Audit - In October 2015, RO engaged the services of Test Consultant, Inc. to conduct a Technical Audit and Evaluation of the Concessionaires’ CAPEX programs and projects.
2. Regulatory Financial Audit - In 2016, RO will procure the services of a consultant for the conduct of the Regulatory Financial Audit of the Concessionaires. The consultant will look into the Concessionaires’ books of accounts and other business records and evaluate their claimed OPEX, among others things.
3. Review and Validation of Asset Condition Report (ACR) - In 2016, RO will procure the services of a consultant for the review and validation of the Concessionaires’ ACRs. This is a means to monitor the Concessionaires’ performance in operating and maintaining the expansion and development of the asset base and is an essential decision support mechanism to counter check the validity of their respective Approved Business Plan. The proposed consultancy services will involve field validation including the conduct of independent condition and performance assessment for each and every above-ground asset as against the Concessionaires’ 2015 ACRs. It will also include developing a system of monitoring and evaluating the condition and performance of assets based on its ability to provide the required levels of service that will be used by the RO in its asset monitoring functions.
4. Demand Projection - RO, in coordination with the Corporate Office, developed the Terms of Reference for the Consultancy Services Assessment of Water Demand in the East and West Zone. The study aims to provide technical assistance to Manila Water and Maynilad in forecasting demand in their respective concession areas. The results of the study will be used in developing programs/strategies to meet medium- and long-term water demand requirements.

B. RO is introducing improvements in its regulatory systems and processes. These reforms are meant to strengthen the Concession Agreement and to promote stability in the conduct of regulatory mandates.

1. The Regulatory Office developed the Concession Accounting and Auditing Guidelines (CAAGs) – CAAGs is a set of rules and principles that shall govern the treatment of Regulatory Accounts for purposes of determining each of the Concessionaires’ OCP. The primary objective of the CAAGs is to ensure that the Concessionaires’ respective Receipts and Expenditures identified by the Concessionaires as recoverable and included in its respective business models are valid, efficient, and reasonable or prudent, and in compliance with the provisions of the Concession Agreement, in the normal course of business operations particularly water delivery and sewerage within its respective concession specified zones.
2. ADR Framework - The Regulatory Office is developing an ADR Framework that provides the basis for RO to determine, from time to time, an ADR based on specific data sources previously identified for this purpose. The Framework generally aims to standardize the process in the determination of the ADR.
3. Key Performance Indicators and Business Efficiency Measures (KPI-BEMs) Guidelines - RO reconstituted its committee on the KPI-BEMs to improve on the KPI-BEMs Guidelines. The KPI BEMs Committee is headed by the Chief Regulator with members coming from all Regulation Areas.
4. Technical Audit Guidelines - RO is developing Technical Audit Guidelines that will provide as basis in the technical audit and evaluation of the Concessionaires’ CAPEX programs and projects. Its principal objective is to determine if the CAPEX programs and projects are being implemented following the standards set in the Guidelines.

Participate in NWRB Policy and Protocols

Climate change has become a normal occurrence. A dynamic review of protocols, water allocations and thorough updates on water permits is vital to the MWSS mandate. MWSS strives to be an active player in the Technical Water Group of NWRB.

It is imperative to always pronounce the hierarchy of water allocation in Angat: First Domestic, second irrigation and finally power. Bulacan is also a major stakeholder in water release protocols considering that the water spilled floods its downstream municipalities.

MWSS initiated talks with NWRB and NIA to replace their existing allocations with other CAPEX projects to relax the tension during El Nino months.
Legacy 5

MWSS ASSET MANAGEMENT

Develop the MWSS Compound as Center for Water Excellence

An important aspect in creating an enabling and nurturing environment is to properly utilize the MWSS Compound as the Center for Water Excellence in Metro Manila through the Balara Water Hub Project. This PPP may be initiated immediately. Included are:

i. Creation of water educational facilities for schools, water agencies, conferences.
ii. More sports and recreational facility that may be used for company events (sports activities, anniversaries, seasonal celebrations). In addition, this may be opened up for rental thereby increasing rental income for the company.
iii. Renovation of the MWSS buildings, warehouses, open space that will exemplify compliance to energy conservation measures and optimization of office space.
iv. Improvement of traffic and parking services to complement an expected rise in vehicles within the MWSS Compound. Traffic management and parking services need to be studied. The rehabilitation of the covered parking lot may be considered to relieve parking congestion.

v. Establishment of world-class campus security measures that promote the safety and welfare of both the government and private employees including visitors coming into the compound. Strategic plans should be mapped out by the Unified Security Group, under the leadership of MWSS, to protect agencies and companies here against crime, fire, and any act of terrorism.

Implement Asset Management Improvement in MWSS

Conduct Revaluation and Appraisal of Property, Plant and Equipment (PPE)

The conduct by a third party of the revaluation and appraisal of MWSS PPE will open the door to opportunities (revenue-generation) and closure to COA observations. The terms of reference for the bidding of a service provider who will conduct the appraisal is ongoing and the actual awarding of the contract will be within 2016.

Create and Execute a Master Development Plan for Idle Real Estate Properties

There is a need for a Master Development Plan for real estate properties retained with MWSS in order to determine the highest and best use of said assets. The 2011 Commission on Audit’s Annual Audit Report cited various lots which have remained idle or unutilized resulting in undue loss to the agency. Twenty Lots containing 273,076.65 square meters located in various locations had been idle. Initially, a consultant should be hired to develop the terms of reference for the MWSS Master Development Plan. The consultant should also include a recommendation on the procurement and project implementation timelines.

Secure Board Approval for a MWSS Right of Way Policy

Mindful of the extent of the MWSS Right of Ways, the MWSS Board of Trustees have instructed the creation of policy that will optimize the use of its ROWs especially its contribution to traffic mitigation, community development (park, barangay centers, playgrounds).

Secure the MWSS Art Collection in the National Heritage Museum

One of the MWSS initiatives is the updating of the inventory of the company’s art collection mostly acquired in the 1970s and 1980s. In summary, the collection includes:

1. 107 Paintings which include 3 items of national artists
   a. Hermogenes R. Ocampo—24’ x 32’ Abstract in Red and Black, acquired in 1977
   b. Ang Kiukok—11’ x 17’ Rooster, acquired in 1984
   c. Jose Joya—14’ x 24’ Abstract in bright colors, acquired in 1979
2. 21 Portraits of past MWSS Administrators
3. 12 Presidential brass sculptures
4. 7 Brass sculpture
5. 3 Tin works
6. 1 Cement statue

Considering that these works of art have historical value, there are talks with the National Heritage Museum to turnover the assets upon completion of the appraisal by an art expert of the actual value of the collection. Bidding should commence in 2017.
Review the Needs of the Human Resources

<table>
<thead>
<tr>
<th>Human Resources</th>
<th>Total:</th>
<th>Unfilled:</th>
<th>Filled:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plantilla</td>
<td>153</td>
<td>47</td>
<td>106</td>
</tr>
<tr>
<td>Management Positions</td>
<td>12</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Career</td>
<td>11</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Non-career</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Rank and File</td>
<td>141</td>
<td>44</td>
<td>97</td>
</tr>
</tbody>
</table>

**Educational Background:**
- 2 Elementary
- 14 Vocational/Trade Course
- 14 High School Graduate
- 42 College Graduates
- 36 Social Science
- 7 Law
- 10 Engineering
- 24 Masteral Degrees

Age:
- 20-30: 10
- 31-40: 23
- 41-50: 55
- 51-60: 9

Gender:
- Male: 49
- Female: 48

Technical vs. Admin:
- Technical: 29
- Administrative: 68

The present ratio of 2.34:1 administrative vs technical personnel does not support the thrust of the agency to be a world-class water engineering agency. This is the reason for the need to execute the MWSS approved reorganization. 60% of the rank and file population is 51 years of age and above with the water experts in this category. There is a need to cascade the wealth of knowledge to new hires who can continue service in the water sector.

Review the Benefits of the Employees

Several benefits have been rationalized as they have no approval from the Office of the President. However, an included in the Collection Negotiation Agreement of 2014, the Management may begin the following initiatives:

a. Implementation of the Program on Awards and Incentives for Service Excellence (PRAISE)
b. Development of a subsidized education program for qualified officials and employees, subject to existing rules and regulations and availability of funds
c. Upgrade of the fitness gym
d. Maintenance of a medical clinic
e. Increase in shuttle service vehicles for MWSS employees

Tap the Civil Service Commission’s Human Resource Initiatives to Augment Competencies in the Workforce

As the premier human resource institution of the Philippine government, the Civil Service Commission has developed a number of Human Resource (HR) Initiatives that will help the institution carry out its mandate, as well as elevate the state of human resource management and organization development in the public sector.

There are five CSC’s HR Initiatives and MWSS Corporate Office is compliant with two of the initiatives

1. Program to Institutionalize Meritocracy and Excellence in Human Resource Management (PRIME-HRM), compliant based on CSC Resolution No. 942117 dated 14 April 1994. — Status: Compliant but undergoing revalidation
   - The PRIME-HRM is a mechanism that empowers government agencies by developing their human resource management competencies, systems and practices toward HR excellence. In this process, CSC will assess the maturity level of an agency’s competencies, systems and practices in four HR systems: a) Recruitment, selection and placement, b) Learning and development, c) Performance Management; and d) Rewards and recognition
   - CSC continues to capacitate agencies in the performance of their HR management function and recognize best practices in the various areas of HR management. MWSS Corporate Office is one of such agencies accredited by the CSC per CSC Resolution No. 942117. The results of the Level II Revalidation Assessment conducted by the CSC-National Capital Region resulted on CSC Resolution No. 1300472 dated 4 March 2013, MWSS-Corporate Office re: PRIME-HRM; Revalidation of Level II Accredited Status. CSC revalidated MWSS’ Level II status. In July 2016, another revalidation process was done, the result of which is to prepare an MWSS Agency Plan for the four HR systems mentioned above. This is due by August 2016

2. Strategic Performance Management System (SPMS), compliant since September 2013. — Status: Compliant
3. Competency-Based Recruitment and Qualification Standards (CBRQS) — Status: For 2017 completion
4. Competency-Based Learning and Development Program (CBLDP) — Status: TBD
5. Leadership and Coaching Program (LCP) — Status: TBD

In support of the CSC’s HR Initiatives, Management recommends the development of a Competency-based HR System which will support three HR Initiatives namely, 1) SPMS, 2) CBRQS, and 3) CBLDP. As a result, competency trainings were conducted from February to April 2016.

<table>
<thead>
<tr>
<th>Schedule for Completion of Competency-based Recruitment and QS</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Competency model development and profiling</td>
<td>Q4 2016</td>
</tr>
<tr>
<td>Creation of competency models or framework</td>
<td></td>
</tr>
<tr>
<td>Creation of competency profile for each position</td>
<td></td>
</tr>
<tr>
<td>Creation of MWSS-CO competency catalogue</td>
<td></td>
</tr>
<tr>
<td>II. Development of a competency-based job description</td>
<td>Q4 2016</td>
</tr>
<tr>
<td>III. Competency assessment of employees</td>
<td>Q1 2016</td>
</tr>
<tr>
<td>IV. Integration of competencies in the recruitment and promotion system</td>
<td>Q2 2016</td>
</tr>
</tbody>
</table>
Legacy 5

SYSTEMS IMPROVEMENT

**Implement the Three-Year Information System Strategic Plan (ISSP) 2016-2019**

ISSP is the overall strategic plan for the development and implementation of information systems, the use of information and communication technology (ICT), as well as the corresponding resource requirements over a fixed long-term period (planning horizon). The ISSP is considered a tool to ensure ICT application in strategic areas of government occur.

**MWSS Water Security Legacy Plan and the ISSP**

The ISSP, as approved by the National Computer Center, approved the timeline below for the implementation of systems that will transform the organization into an agency with the latest information systems.

**Suggested Timeline**

- **Year I**
  - General Ledger, LAN, Legal Software
  - MWSS Portal
  - Property Mgmt Information System, Procurement Tracking System
  - Document Management System, Knowledge Bank System

- **Year II**
  - Human Resource Information System
  - Finance Management Information System
  - Business Continuity System
  - Concession Monitoring System

- **Year III**
  - Sustainability
  - Executive Support
  - Business Intelligence
Prepare for La Niña

On May 18, 2016, the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) issued its La Niña watch stating a probable occurrence of the said phenomenon in the last quarter of 2016. The Philippines experienced a very strong El Niño in which lasted from March 2015 to May 2016. Historical records show that La Niña is likely to occur immediately after an El Niño event.

As observed by the Inter-Agency Technical Working Group (TWG) on Angat Operations, there are still lingering effects of El Niño on the monthly inflow of Angat Watershed resulting in the low Elevation of Angat Dam as of August 3, 2016. The reservoir is expected to recover by the end of August. With the expected increase in Angat inflow from September to December 2016, possibility of spilling is high especially on typhoon season. Dam operators constantly check and if situation permits test the integrity and operability of the spillways and gates preventing damage to the dams. The TWG is working with PAGASA to closely monitor incoming rainfall and inflow to the dams for advanced planning of flood operations.

The stakeholders are MWSS, National Water Regulatory Board, PAGASA, Angat Hydro Corporation, National Irrigation Authority.
WATER CONSERVATION

Communicate Intelligent Water Use

Complementary to this strategy is MWSS and its concessionaires' communication to households on the wise use of water during El Niño when water needs to be conserved.

The communication should include messages that improve and affect the services we provide the public,

1. Regular communication of water-saving tips should be cascaded in the television, radio, internet, and the social media. MWSS needs to tap the public through the social media to educate the youth on the importance and scarcity of water.
2. While the redundant water sources are not yet put in place, the efforts at communicating such measures need to be stepped up.
3. The dam levels are closely monitored each year, and when these reach critical points, such communications are released in order to raise the public for El Niño episodes and to help the overall water situation in general.
4. In the event of calamities, the assistance MWSS and its concessionaires provide to stricken areas need to be communicated so that the public is aware and can count on the agency in times of crisis.

BUILDING WATER CONSERVATION TIPS:

- Keep the plumbing system in good working condition
- Recycle water from steam boilers as boiling feedwater or use them to flush toilets or for cleaning/mopping floors.
- Install meters on areas with high water consumption to allow determination of any reduction in consumption when water reduction programs are put in place.
- Install shut-off on water hoses or low volume/high pressure nozzles (LVHP) or flow constrictors on faucets and showers to save on water.
- Install water catchment basins on downspouts and air conditioning systems and use the residual water to water plants.
- Close water gate valves when not in use (e.g., Saturdays and Sundays).
- Give only the right amount of water to customers who request for water and use the residual water to water plants or to clean building surroundings or floors.
- Post water conservation tips on conspicuous places within the building. Immediately report any unabated leaks to MWSS Regulatory Office at 925-6619 and to your water concessionaire (Maynilad Water Hotline 1626 or Manila Water Hotline 1627).

INDOOR:

- Repair running toilets and leaky faucets;
- Turn off the tap when brushing your teeth, washing your hands, and shaving;
- Take shorter showers;
- Don’t let the water run unabated while you wash dishes;
- When taking a bath, use dipper from pail instead of running water from shower;
- Collect the water you use for rinsing fruits and vegetables, then reuse it to water houseplants;
- Designate one glass for your drinking water each day or refill a water bottle. This will cut down on the number of glasses to wash;
- Teach your children to turn off faucets tightly after each use; and

OUTDOOR:

- Water your plants and lawn early in the morning or late in the afternoon when it’s cooler. Don’t water your plants during windy days or high noon;
- Don’t water your lawn often. Never soak your lawn; grass does not need a lot of water;
- Use pail and dipper instead of sprinklers when watering plants;
- When cleaning your sidewalk or driveway, use a broom instead of a hose;
- Reduce the amount of grass in your yard by planting shrubs, and ground cover with rock and granite mulching.
- Use a pail and cotton rag when washing your car. Do not use a running hose and sponge;
- Immediately report to concerned concessionaire any water leaks from busted pipes, pilferage, etc;
- Use recycled water (e.g., water used in dish-washing) for watering plants; and
- Collect water from your roof to water your garden.
- Share water conservation tips with friends and neighbors.

There are a number of ways to save water, and they all start with you.
“Where there is no water, there is no life…. We live by the grace of water.”

*Michael Parfit*

National Geographic Writer