EURASIAN WATER CONFERENCE
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Urban solutions for global challenges
13-14 September 2018 Budapest

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Urban Water Management in the Philippines: The Munoz Science City H2O District Experience

by Dr. Josue S. Falla, CESO V (Ret.)
Mabuhay ang Pilipinas!

REPUBLIC OF THE PHILIPPINES
Capital: Manila

• **Population** : 104 million
• **Area** : 300,000 sq km (115,831 sq miles)

• **Major languages** : Filipino, English (both official)
• **Major religion** : Christianity

• **Life expectancy** : 66 years (men), 73 years (women)
• **Currency** : Philippine Peso (ER: P53 : 1USD)
• **Leader** : Pres. Rodrigo Duterte

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Munoz Science City

- Central Luzon State University (CLSU)
- Philippine-Sino Center for Agricultural Technology (PhilSCAT)
- Philippine Center for Postharvest Development & Mechanization
- National Irrigation Administration (CASECNAN Project)
- Philippine Rice Research Institute (PhilRice)
- Philippine Carabao Center (PCC)
- PAGASA Weather Station
- Nueva Ecija Fruits & Vegetables Seed Center
- Department of Science & Technology
- Others
Muñoz Water District (MWD) is a GOCC (Government-Owned&Controlled Corporation) established in 1987. It started its full operation in 1992; responsible for providing safe water for the Science City of Muñoz.

MWD draws groundwater from five (5) deep wells; with officers, staff and tariffs under government regulations. It submits monthly financial, commercial, and operational data to the Local Water Utilities Administration (LWUA), the national regulatory body.
VISION  : To be the country’s top performing water districts in terms of reliability, sustainability, affordability, and accessibility in providing clean & safe drinking water for customer satisfaction.

MISSION  : To uplift the quality of life thru continuous delivery of safe, adequate and potable water to the public with a well defined system of operation to assure efficient responsive customer service.
General Performance (2017 Data)

Based on Commission on Audit (COA), MWD has a low Unaccounted Flow of Water (UFW) of **23.37%** with full metering for both production and consumer use.

Per capita consumption of **130 lcpd** is sufficient for proper hygiene and low enough for water conservation.

Water is available 24/7 to all consumers covering of **93.75%** of the population in its service area.

MWD finances have an operating ratio of **79.50%**, and is expanding through internally generated reserves. Tariffs are able to cover O&M costs as well as expansion costs.
General Data

- Connection: 4,875
- Staff: 29
- Annual O&M: Php 26,426,058.22
- Annual Collections: Php 32,202,956.45
- Annual Billings: Php 31,341,564.55
- Total Capital Expenditures: Php 6,141,463.57

Source of funds: 100% internally generated reserves
<table>
<thead>
<tr>
<th>Classification</th>
<th>Size</th>
<th>MIN.CHARGE 0-10 cu.m.</th>
<th>11-20</th>
<th>21-30</th>
<th>31-40</th>
<th>41-50</th>
<th>51-UP</th>
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<td>RESIDENTIAL</td>
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<td>COMMERCIAL/INDUSTRIAL</td>
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<td>43.75</td>
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<td>COMMERCIAL (B)</td>
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<td>COMMERCIAL (C)</td>
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<td>31.25</td>
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<td>40.00</td>
<td>46.25</td>
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<td>BULK/Wholesale</td>
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<td>75.00</td>
<td>84.00</td>
<td>96.00</td>
<td>111.00</td>
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CONSUMER SERVICE

The average monthly consumption is **20.18 m³** per household of 6-7 persons. The water bill averages **Php 552.14** per month per household.

The water has a high quality standard with **60 water samples** taken during the year passing the bacteriological tests as well as **5 physical and chemical analyses**. There were a total of **3,498** maintenance order and **1,347 service requests** attended.
**PRODUCTION-DISTRIBUTION**

- **Average Daily Production**: 4,256.07 cu.m.
- **Groundwater**: 100%
- **Surface Water**: Nil
- **Storage**: 273 m³
- **Service Area**: 90.20 sq. km.
- **Distribution Pipes**: 104.32 km.
Storage Tank

- Elevated Steel Tank

Year Constructed: 1987
-Capacity: 273 cu.m.
-Location: Bayuga Compound, MSC
TRANSMISSION/DISTRIBUTION FACILITIES

- Length of Pipeline: 104.32 Km.
- Size of Pipeline: 50 mm. Ø to 200 mm. Ø
- Type of Pipe: PVC, HDPE
- Gate Valves: 79 units
- Fire Hydrants: 37 units
- Blow-Offs: 42 units
**Pump/Motor:**
- Submersible pump capable to deliver 500 gpm 40 hp, 460V, 3 Phase Motor
- Ave. pumping capacity: 30 lps

**Control Panel:**
- Auto transformer type, reduce voltage magnetic starter (DANFOSS)

**Type of Chlorinator:**
- EMEC 8.0 ltr/hr.
- Metering pump, 230VAC 50-60Hz

**Generator Set:**
- FG Wilson by LEROY SOMER, 440 volts 3 phase 120 KVA diesel

**Discharge line (from pump to distribution line):**
- 25mm Air release valve
- 150mm Sleeve type coupling w/ harness set
- 150mm Flow meter
- 150mm Check valve
- Pressure gauge
- Chlorine injection valve
- Splash box
- 150mm butterfly valve
- Gate valve

**Distribution line:**
- Chlorine Dioxide
GROUND WATER SOURCES

E. Bayuga. Deepwell
36 lps

Villa Pinili Deepwell
30 lps

Brgy. Maligaya Deepwell
21 lps

Villa Isidra Deepwell
21 lps

Brgy. Bical Deepwell
21 lps
## Production Capacity

<table>
<thead>
<tr>
<th>Location</th>
<th>Capacity</th>
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<tbody>
<tr>
<td>Bayuga St. Deepwell</td>
<td>669,091 cu.m. /yr</td>
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<tr>
<td>Villa Pinili Deepwell</td>
<td>242,032.40 cu.m. /yr</td>
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<tr>
<td>Brgy. Maligaya Deepwell</td>
<td>80,295 cu.m. /yr</td>
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<tr>
<td>Brgy. Bical</td>
<td>214,330 cu.m. /yr</td>
</tr>
<tr>
<td>Villa Isidra Deepwell</td>
<td>348,317.48 cu.m. /yr</td>
</tr>
</tbody>
</table>

**Total Available Source Capacity** - 3,878,928 cu.m. /yr

**Total Water Produced** - 1,339,735.88 cu.m. /yr

**Percentage Utilization** - 40%
**WATER TREATMENT FACILITIES**

*Chlorine Dioxide*

- **Type of Chlorinator:**
  EMEC 8.0 ltr./hr. Metering pump, 230VAC 50-60Hz

*Calcium Hypochlorite*

- **Type of Chlorinator:**
  EMEC 8.0 ltr/hr. Metering pump, 230VAC 50-60Hz
FLUSHING - ang sistema ng pagdadala ng isang mabilis at malakas na daloy ng tubig sa water system.
BACTERIOLOGICAL TEST – Ang prosesong ito ay ginagamit upang regular na kumpirmahin, na ang tubig ay ligtas inumin.
Free Chlorine Test – ito ay ang pagsusuri ng natirang chlorine sa tubig.

Total Chlorine Test – ito ay ang pagsusuri ng kabuuang dami ng chlorine sa tubig.
PRIMARY HEALTH CARE (PHC) TEST – Ang PHC test o “Hydrogen Sulphide Paper Strip Method” ay ang pagsusuri upang malaman ang “microbial quality” ng tubig.
Thank you for your kind attention!