



# Water Units of Service Phase 2 Project Update

*January 9, 2019*



**BLACK & VEATCH**



**GLWA**  
*Great Lakes Water Authority*

# Agenda

- Project Overview
- Field Work
- FY2020 Recommended Units of Service
  - Process
  - Dearborn
  - Detroit
  - Highland Park
- Water Balance
- Questions



# Water Units of Service Phase 2 Project Overview

## What Are Water Units of Service?

- Water demands of Member Partners - average day volume, maximum day flow rate and peak hour flow rates
- Distance and Elevation from Water Treatment Plants
- Both metered and non-metered water Member Partners have Units of Service

# Water Units of Service Phase 2 Project Overview

## What is the Water Units of Service Project?

- Analytical and field study aimed at refining units of service for the water systems' non-master metered Member Partners as well as performing a water audit and water balance for the regional water system.

### Phase 1: March 2017 – December 2017

- Desktop Analysis
- Best Available Data
- Use of benchmarks and peers

### Phase 2: January 2018 – December 2018

- Obtain data from the field
- Improve processes
- Collaboration

# Water Units of Service Phase 2 Project Overview

## What is a System Water Audit?

As published by the American Water Works Association:

- A **Water Audit** typically traces flow of water from water withdrawal or treatment, through a water transmission and/or distribution system, to customer connections. The water audit usually exists in the form of a worksheet or spreadsheet that details the variety of consumption and losses that exist in a water system.
- A **Water Balance** summarizes the components and provides accountability, as all of the water placed into a system should – in theory- equal all of the water taken out of the system.

# Water Units of Service Phase 2 Project Overview

## Who Are the Non-Master Metered Water Customers?

- Dearborn
- Detroit
- Highland Park

# Water Units of Service Phase 2 Project Overview

## Status of the Project

- Work was completed throughout 2018.
- The Analytical Work Group (AWG) was updated on progress at regular meetings during 2018.
- Weekly meetings were held with Dearborn and Detroit to review status and discuss coordination throughout the field efforts.
- Black & Veatch's draft Phase 2 report was presented at the November 29, 2018 Charges Roll Out Meeting #2.
- Report in draft form was published to the Outreach Portal on November 30, 2018 for Member Partner review and comment.
- The AWG met on December 11 to receive feedback and answer questions
- The AWG reached consensus on the Detroit, Dearborn, and Highland Park values
- Consensus was subject to modifications on three items



## PHASE 2 WORK AREAS

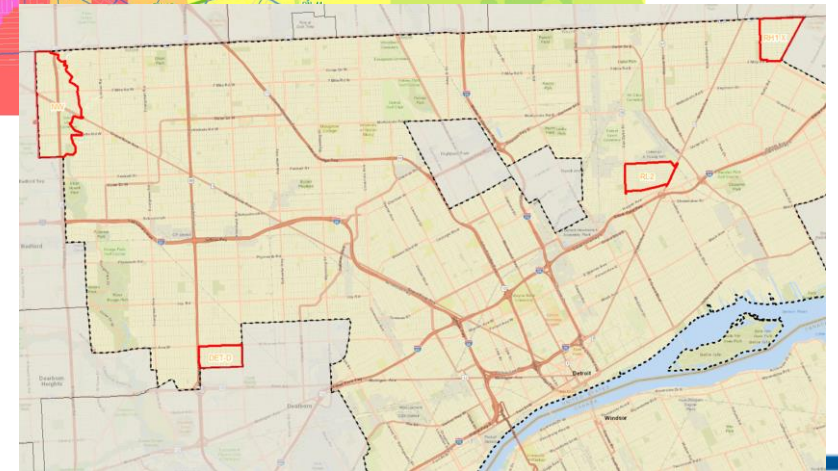
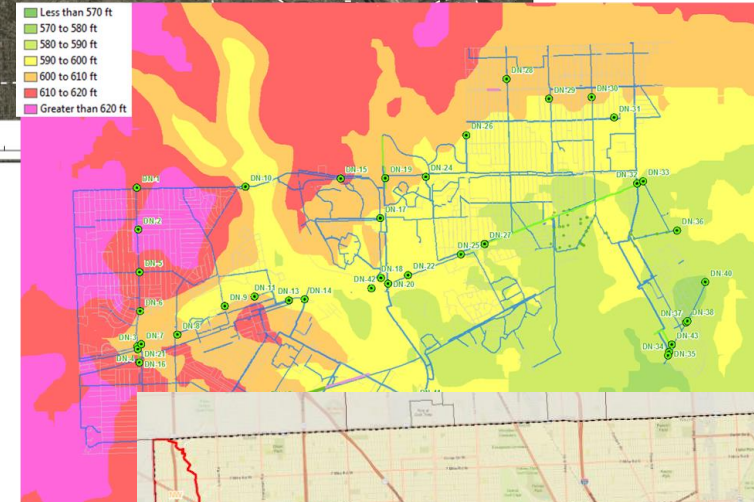
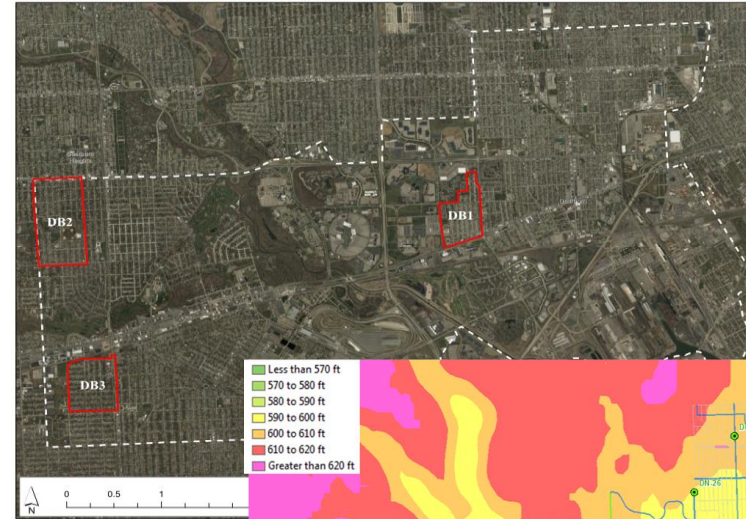
- Conduct District Metered Area Analyses for Dearborn and Detroit
- Evaluate Water Treatment Plant Water Production Flow Meter Testing
- Evaluate Water Transmission Main Blow Off Valve Assessment
- Develop Master Metering Approaches for Dearborn, Detroit, and Highland Park
- Assess Wholesale Meter Testing Protocols
- Identify and Prioritize Data Gaps
- Develop a Long-term Water Audit Approach for GLWA
- Develop a Process for an Annual Wholesale Meter Audit
- Preparation of Phase 2 Report (distributed on 11/30 via Outreach Portal)



# Field Work

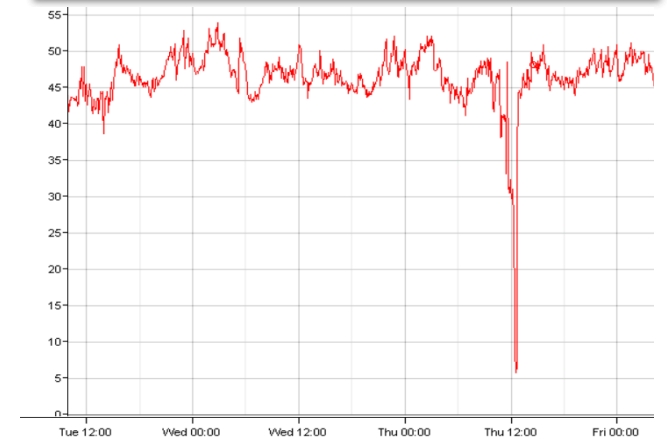
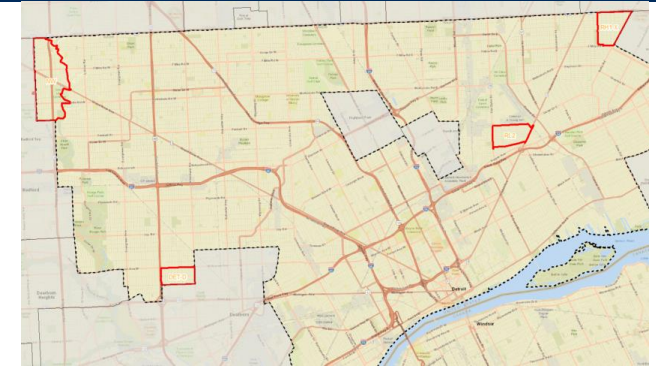
# SELECTION OF DEARBORN & DETROIT DMAS

- High probability of isolation
- Areas representative of broader system
- Data available for extrapolation (e.g., pipe age, pressures)
- Minimal valve closures
- No DMA in commercial and industrial areas:
  - Impact of 24/7 operations on minimum night flow
  - Lack of redundancy in DMA for critical customers



# DMA Planning, Implementation & Monitoring

- Detailed collaborative planning
- Hydraulic Modeling
- Metering Technology and Evaluation
- Isolating DMAs – complex, required significant NMMC activity
- Pressure drop tests were performed to confirm isolation
- Collected 5-minute data from IMM and Pressure Monitors
- Retail Meter/billing Data collection



# **Recommended FY2020 Units of Service for Non- Master Metered Customers**

## Process

1. Black & Veatch provided recommendations ✓
2. Water Analytical Work Group discussed and reached consensus ✓
3. Black & Veatch to finalize their Phase 2 Report
4. Units of Service are folded into the Charge Approval Process

## Dearborn Phase 2 Values

- Used 2 District Metered Areas and retail billings for Average Day
- Used comparisons of local peer communities and other WAMR customers' data for Max Day and Peak Hour

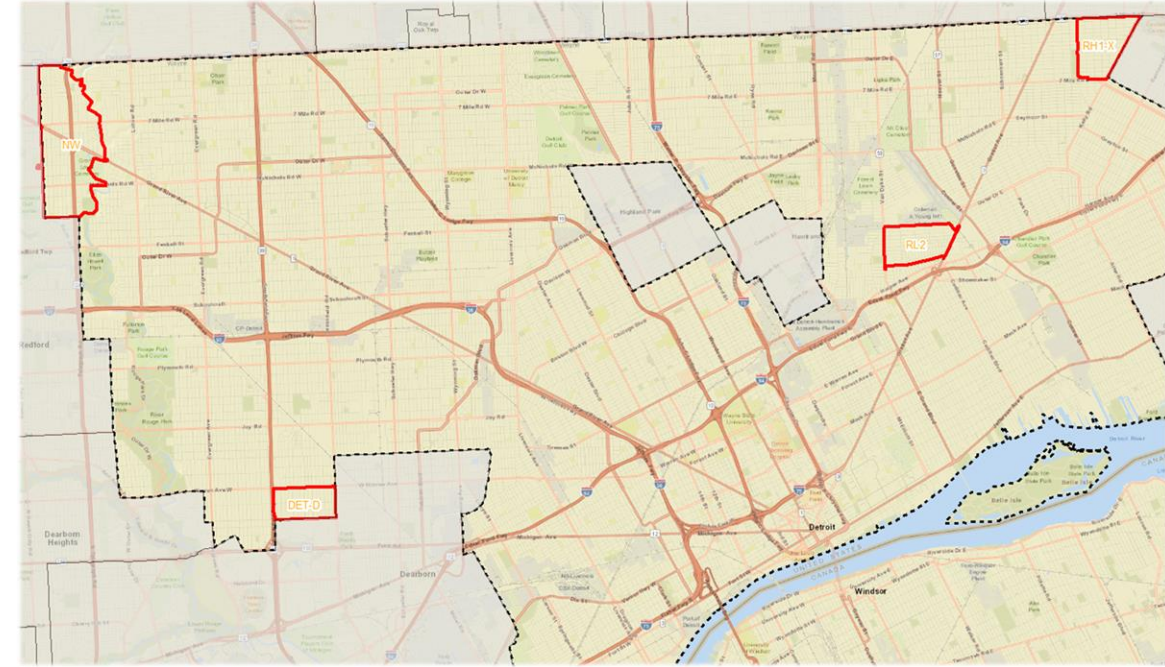
	AVG. DAY	MAX DAY	PEAK HOUR
FY2019 MGD (Phase 1)	14.7	24.7*	34.6*
FY2020 MGD (Phase 2)	12.7	21.8*	30.3*

\*These numbers do not include operational buffers



# DETROIT DMAS

- Two DMAs completed in Phase 2
- DET-D and RH1-X used for UoS
- Equipment installed but no results for NW and RL2
- Field issues encountered with meter locations and hydrant testing
- DWSD concerns over time / effort to achieve isolation in large DMAs
- Currently no data available for NW and RL2





# Finalization of Phase 2 Report and AWG Consensus on Units of Service

- Changes Impacting Draft Report UoS Volumes:
  - Estimation of average mains breaks isolation time for Detroit from 96 to 60 hours
  - Exclusion of 2015 results of NW Detroit DMA in Phase 2
  - Hydrant Test averaging for Detroit DET-D

## DWSD Phase 2 Demands

- Used 2 district metered areas and retail billings for average day
- Scatter plots developed in Phase 1 to project to 900 mgd
- Update to Phase 2 Avg. Day and apply Peaking Factors

	AVG. DAY	MAX DAY	PEAK HOUR
FY2019 MGD (Phase 1)	98.1	120*	141*
FY2020 MGD (Phase 2)	90.9	111*	131*

\*These numbers do not include operational buffers

# Highland Park

- Approx. 2,700 retail connections
- System had its own source of supply until 2012
- Currently supplied from GLWA system
- Currently three connections open; each is measured with an insertion meter, tracked in WAMR
- Daily, hourly, and 5-min data available
- Notable change in flow patterns in April 2018

## Highland Park: Average Flow Data

Measurement Basis	Average Flow
Last year of monitoring data from WTP (2012)	2.2 mgd
Insertion meters installed June/July 2016	3.1 mgd
June 2016 – July 2017 (Phase 1)	3.1 mgd
April 2018-Present (Phase 2)	2.2 mgd

## Highland Park

- Valves checked on multiple occasions and found to be as expected
- Meters pulled, calibrated and reinstalled in August 2018
- Reported leak detection and repair activity (0.75 MGD repair on 4/19/18)
- Apply peaking factors from Phase 1 to calculated max day and peak hour

	AVG. DAY	MAX DAY	PEAK HOUR
FY2019 MGD	3.07	3.94*	4.03*
FY2020 MGD	2.18	2.79*	2.86*

\*These numbers do not include operational buffers

# GLWA Water Balance

## 2017 GLWA Water Balance

TOTAL VOLUMES ASSIGNED BY ENTITY	AVG. DAY (MGD)	MAX DAY (MGD)	PEAK HOUR (MGD)
WAMR / Wholesale	281	475	591
Dearborn	12.7	21.8	30.3
Detroit	90.9	111	131
Highland Park	2.18	2.79	2.86
Transmission	26.5	26.5	26.5
GLWA / CTA (Calculated)	40.1	42.8	
Adjusted System Pumpage (Total)	453	680	769



# Questions....Discussion....Feedback