

Brentwood Wastewater Collection System Master Plan

April 9, 2015

HAZEN AND SAWYER
Environmental Engineers & Scientists



OFFICE LOCATIONS

● Regional Office | ● Branch Office

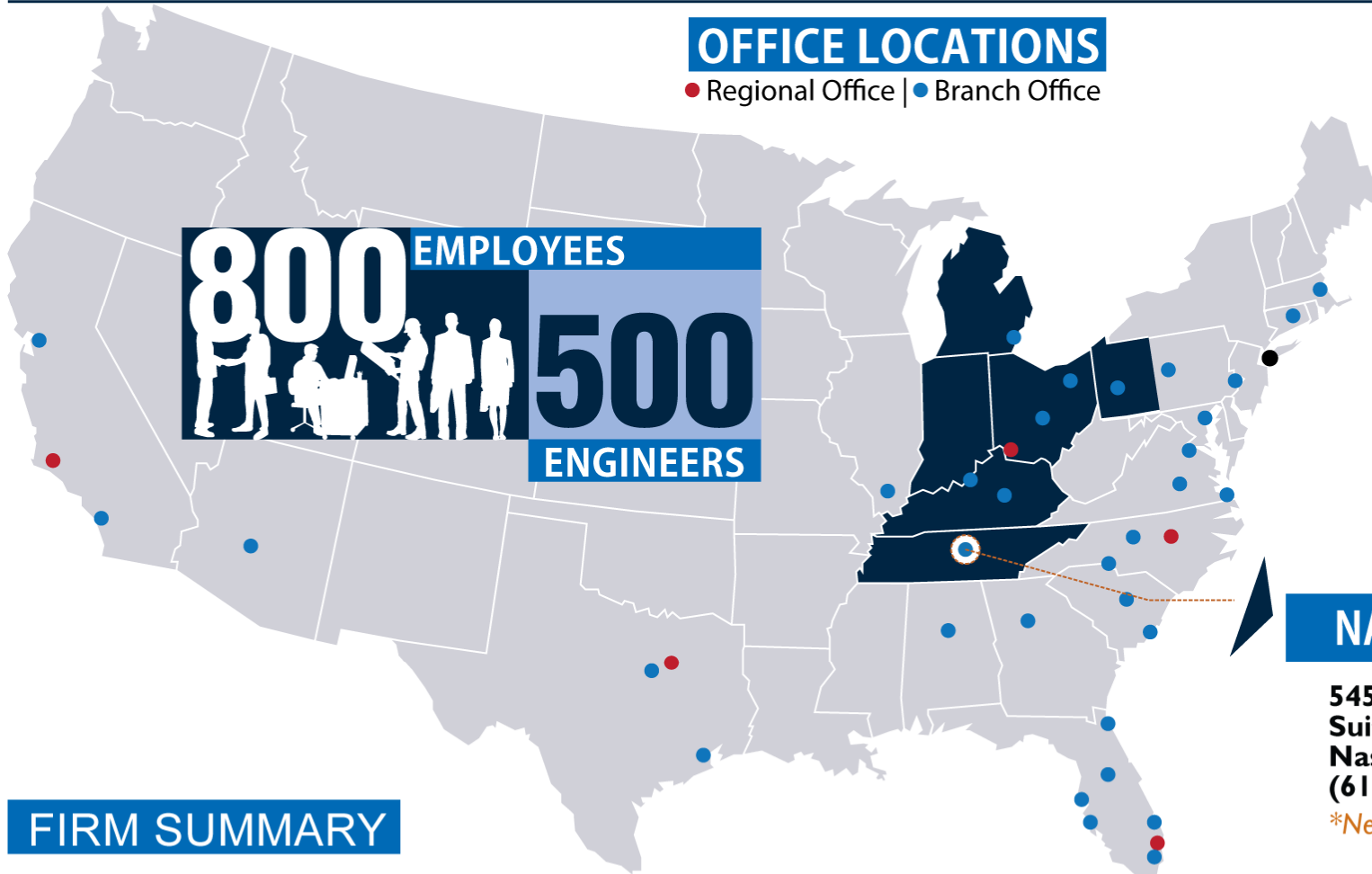
**SINCE
1951**

Hazen and Sawyer has focused on two things: providing safe drinking water and controlling water pollution.

800 EMPLOYEES



500 ENGINEERS



NASHVILLE OFFICE

545 Mainstream Drive
Suite 320
Nashville, TN 37228
(615) 783-1515

**New Office Location*

FIRM SUMMARY

Legal Entity:
Hazen and Sawyer, DPC

Type of Business:
Design Professional Corporation

State of Incorporation:
New York

Website:
www.hazenandsawyer.com

Hazen and Sawyer Project Team

- Scott Woodard, P.E. – Project Principal
- Michael Orr, P.E. – Project Manager
- Ryan Dean – Collection System Hydraulic Model
- Saya Qualls, P.E. – Technical/Regulatory Support
- Other local support staff

HAZEN AND SAWYER
Environmental Engineers & Scientists



Purpose of the Master Plan

- Develop a comprehensive short-term and long-term plan for maintenance and development of Brentwood's wastewater collection system
 - Assure rate payer funds are used in cost-effective manner to maximize benefit and reduce impact on business and residents

HAZEN AND SAWYER
Environmental Engineers & Scientists



Master Planning Elements

Wastewater Collection System

- **Evaluate** existing performance and capacity of collection system
- **Identify** projected short-term and long-term collection system capacity needs based on predicted growth patterns and other drivers
- **Evaluate** alternatives to address needs
- **Identify** short and long term improvements to address capacity issues; when feasible, projects constructed today should address future capacity needs
- **Prioritize** projects
- **Develop** Capital Improvement Plan for implementation

Utilize guidance of EPA, TDEC, WEF and other industry organizations

HAZEN AND SAWYER
Environmental Engineers & Scientists



Master Plan Methodology

- Hydraulic Model Development (completed)
- Data Collection and Analysis
- Develop Future Flow Conditions
- Baseline and Future Conditions Analysis
- Capital Improvements Plan
- Master Plan Report

HAZEN AND SAWYER
Environmental Engineers & Scientists



Master Plan Methodology

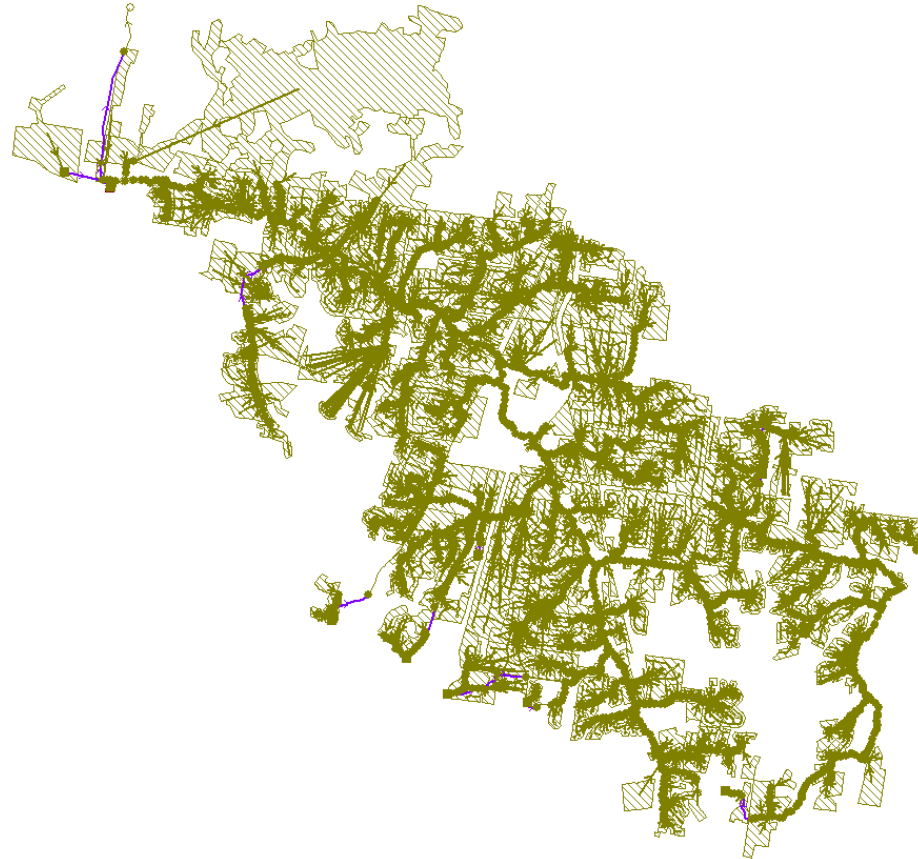
Hydraulic Model Development (completed)

- InfoWorks model developed utilizing GIS, sewer record drawings, previous studies, field investigation, survey and other sources
- Model calibrated for both dry weather and wet weather flows
- Model overview



Brentwood's Wastewater Collection System Model

- +2,000 manholes
- +1,200 subcatchments
- 12 pump stations
- Real-time controls at Brentwood Pump Station
- Pipe size between 2 and 30-inch



HAZEN AND SAWYER
Environmental Engineers & Scientists



Wastewater Collection System Model Development

- Modeling Goals and Objectives
 - Evaluation of existing system
 - Capital planning
 - Optimize operations with better understanding
- Modeling Software
- Typical Modeling Elements
 - Nodes
 - Conduits
 - Subcatchments
 - Pump Stations and Force Mains

HAZEN AND SAWYER
Environmental Engineers & Scientists



Wastewater Collection System Model Flow Meters and Rain Gauges

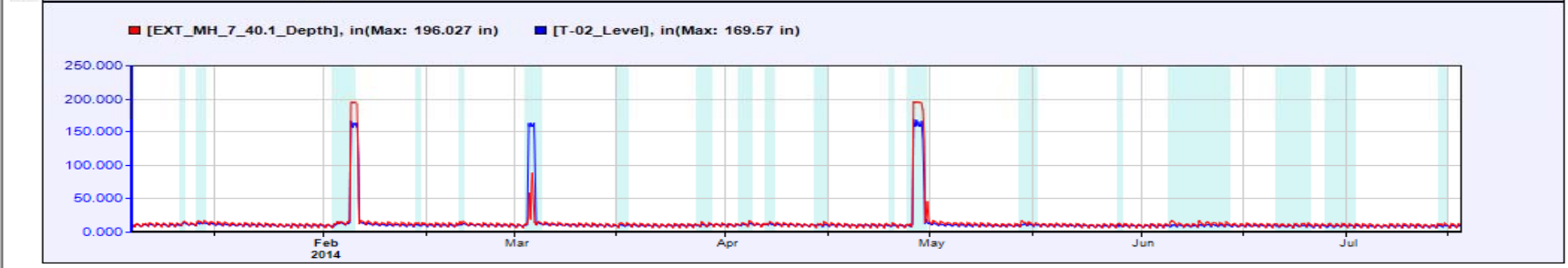
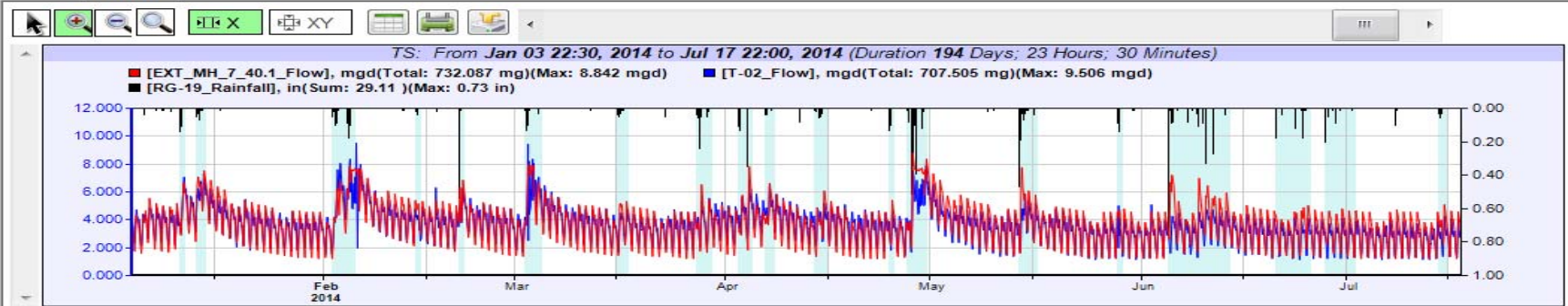
- Rain gauge data
 - Identify periods of dry weather and wet weather events
 - Characterize rainfall events based on return intervals
- Evaluation of meter data
 - Dry weather flows and per capita flows
 - Rain dependent inflow and infiltration
 - Groundwater infiltration



- FM_Sites
- PS

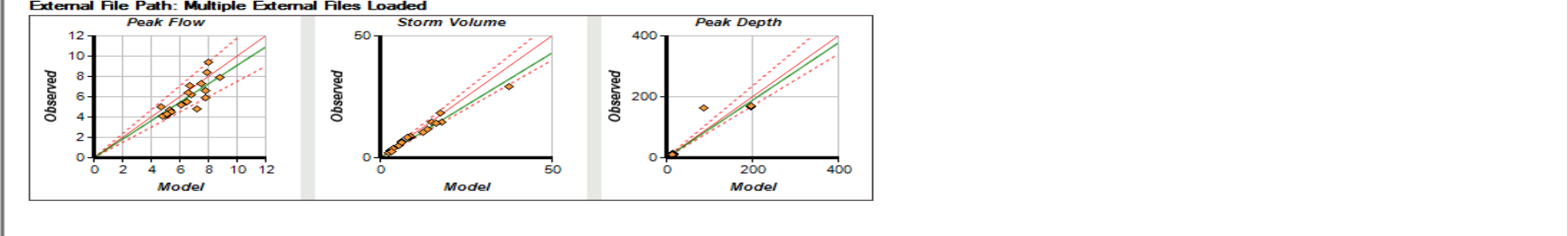
- T-02
 - Link_Compi
 - Link_Compi
 - T-02_Flow
 - T-02_Level
 - T-02_Net_T
 - T-02_Veloc
- T-03
- T-04
- T-07
- T-12
- T-20
- T-42
- W-05
- W-09
- W-13A
- W-22
- W-23
- W-24
- W-30
- W-35
- W-36
- YMCA
- YR-13
- BRNT-BRRG
- BRRG-02
- BRRG-03
- BRRG-04
- RG-19
- RG-21
- Brentwood-PS
- J1
- J10
- J11
- J12
- J13
- J14
- J15

Chart Details



Events DWF and Population RTKs Modeling Results

Calc Stats View Stats Modeling Standards



Master Plan Methodology

Data Collection and Analysis

- InfoWorks hydraulic model
- Past planning reports and studies
- Population growth patterns and projections
- Hydraulic analyses
- Staff knowledge
- Various other sources of relevant data/information



Master Plan Methodology

Develop Future Flow Conditions

- Flow projections by sewershed (workshop)
 - Service boundaries
 - Population projections
 - Development/redevelopment potential
 - Land use
- Planning horizons
 - 2020 (5-year)
 - 2030 (15-year)
 - Ultimate



Master Plan Methodology

Baseline and Future Conditions Analysis

- Condition Analysis
 - Baseline (current) dry weather conditions
 - Baseline (current) 2-year, 24-hour design storm
 - Future Planning Horizons (5, 15, ultimate) dry weather
 - Future Planning Horizons (5, 15, ultimate) 2-year, 24-hour design storm
- Identify
 - SSOs, surcharging lines, hydraulic deficiencies
 - PS performance, other system characteristics
- Design Criteria will be established
- Three workshops during this task – modeling results and design criteria



Master Plan Methodology

Capital Improvements Plan

- Improvements will likely include optimization of existing infrastructure and new infrastructure (workshop)
- Prioritized list of collection system improvements will be developed (workshop)
- Improvement cost estimates
- Improvements grouped and sequenced to minimize disruption and impact
- Schedule for implementation



Master Plan Methodology

Master Plan Report

- Summary of all master planning tasks (workshop)
- Final recommended CIP for short-term and long-term improvements
- Scheduled completion by December 2015

HAZEN AND SAWYER
Environmental Engineers & Scientists



Questions/Discussion

HAZEN AND SAWYER
Environmental Engineers & Scientists

