

# BUILDING A WORLD OF DIFFERENCE

10 May 2012

## TOLEDO WATERWAYS INITIATIVE

**CARY DUCHENE**

DEPUTY DIRECTOR TWI  
BLACK & VEATCH WATER



**BLACK & VEATCH**  
Building a world of difference.®

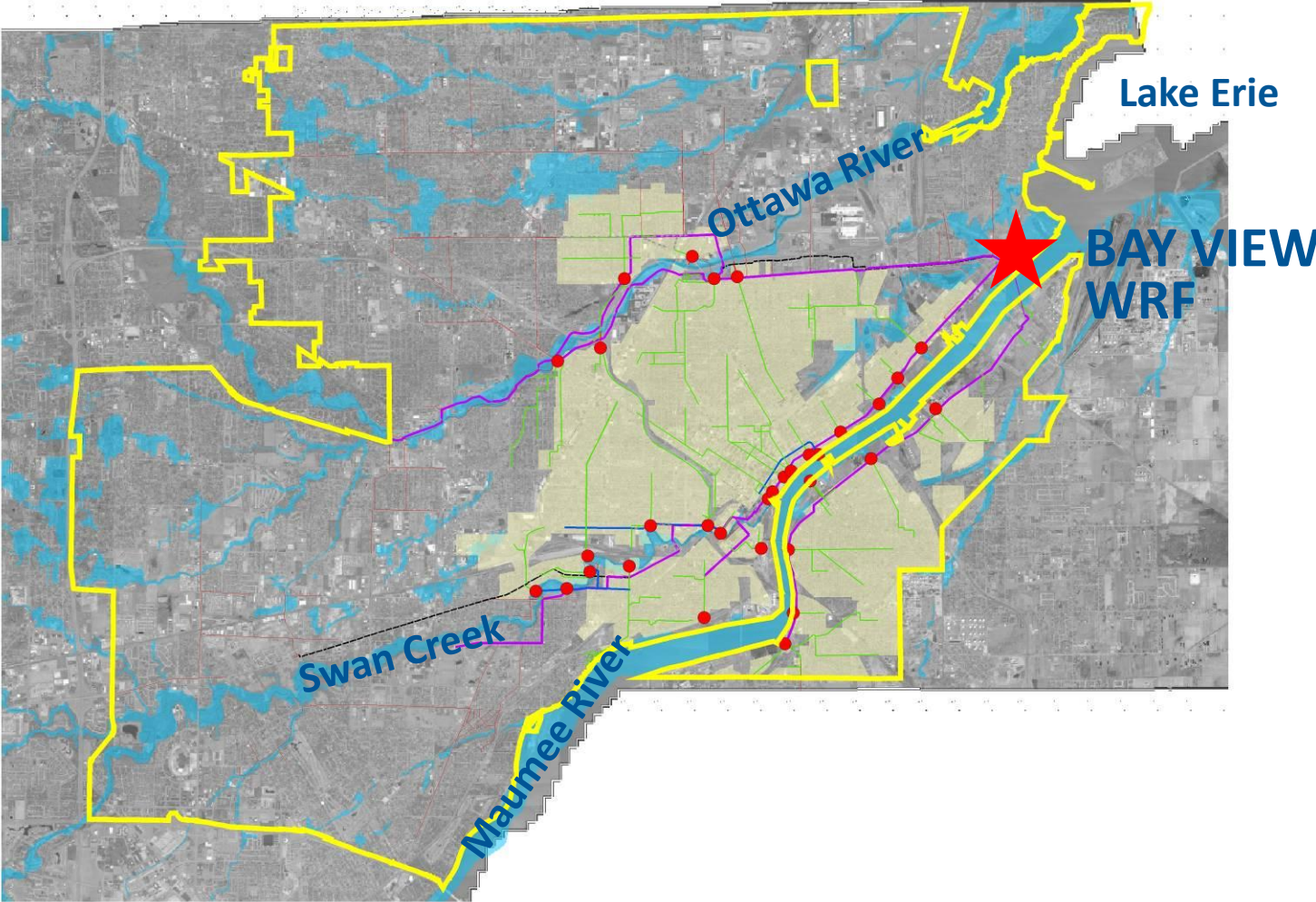
# AGENDA

- Toledo's Wastewater System **Background**
- Wet Weather Program **History**
- **Accomplishments** from Phase 1
- **Status** of Phase 2 – LTCP
- **Ash/Columbus Storage Pipeline**
- **Questions**

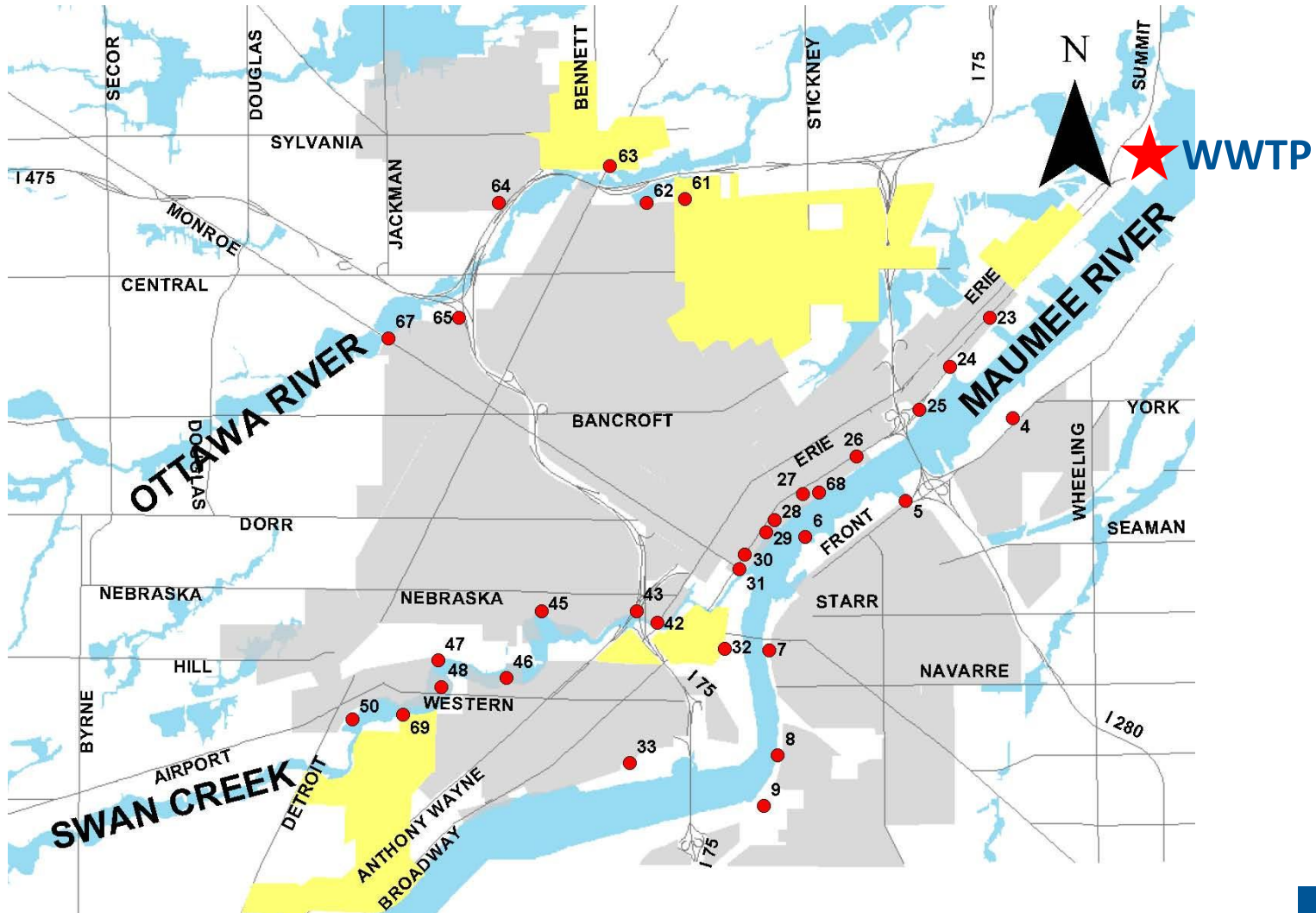
# WASTEWATER SYSTEM CHARACTERISTICS

- Population served – 340,000
- Tributary area – 120 square miles
- Combined Sewer Area – 17 square miles
- Permitted CSOs - 33
- WWTP – Bay View Water Reclamation Facility
  - Annual Average Flow = 70 MGD

# TOLEDO WASTEWATER SERVICE AREA



# WASTEWATER SYSTEM CHARACTERISTICS



# WET WEATHER PROGRAM HISTORY

- **1991 - Initial Litigation**
  - Effluent violations from the 1980s and early 1990s
  - Illegal bypassing at the plant from 1986 forward
  - Monitoring, reporting and recordkeeping violations

# WET WEATHER PROGRAM HISTORY

- 2002 - Comprehensive Wet Weather Consent Decree
- Estimated \$521 M
- Objectives:
  - Eliminate Known SSOs
  - Wet-Weather Treatment Facility at Bay View
  - Develop/Implement CSO Long Term Control Plan

# CONSENT DECREE IMPLEMENTATION

- **Phase 1 (2002 - 2007)**
  - SSO Elimination
  - Bay View Wet-Weather Treatment Facility
  - LTCP Development
- **Phase 2 (2008-2020)**
  - LTCP Implementation



# LONG TERM CONTROL PLAN

- Initial Submittal to USEPA - December 2005
- LTCP Approved by USEPA – 2009
- LTCP Summary
  - 3-4 Overflows/AVG Year – Swan Creek
  - 3 Overflows/AVG Year – Maumee River
  - 0 Overflows/AVG Year – Ottawa R. (2 per 5 years)
  - Pathogen Study
  - 12-year Implementation
  - \$317M

# LONG TERM CONTROL PLAN

- **Planned Results**
  - Overflow Locations from 33 to 23
  - Overflow Frequency from 30+/year to 0-4/year
  - Overflow volume from 625 MG/year to 144 MG/year
  - Reduces typical pollutant discharge by 86%-89%
  - Reduces bacterial discharge by 90%

# PHASE 2 ENGINEERING – LTCP IMPLEMENTATION

- **24 LTCP Projects - \$317M**
  - 3 - SSES/Inflow Reduction
  - 4 - SSES/Sewer Separation
  - 9 - Storage (Combined Sewage)
  - 5 - Enhance Existing Storage Tunnels
  - 2 - Regulator Modifications
  - 1 - Grit Removal Improvements @ Bay View
  - + Pathogen Study

# STORAGE: 9 PROJECTS 55± MG

Facility	Size	Status
Ash/Columbus	2.1 MG	Substantially Complete
Monroe/Ayres	1.3 MG	Under Construction
Maumee	2.7MG	Under Construction
Oakdale	8 MG	Under Construction
Ottawa River South	25 MG	Under Design
Dearborn	1.6 MG	Under Design
International Park	5.5 MG	Design Starts
Downtown	6.7 MG	Design Starts
Swan Tunnel Extension	1.6 MG	Design Starts

# PROJECT: ASH/COLUMBUS STORAGE PIPELINE

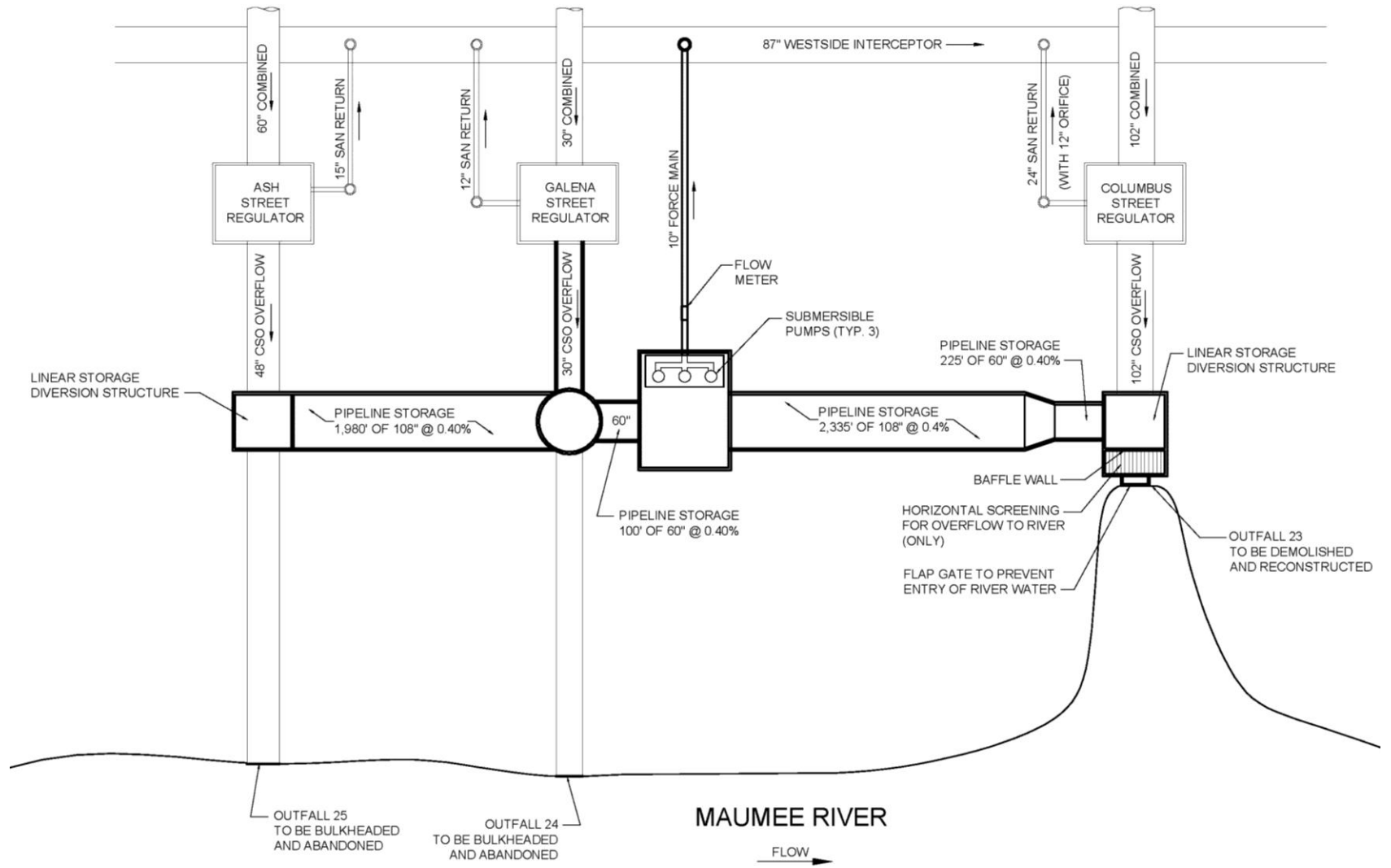
# STORAGE CONCEPT

- **Regulator Overflow to Storage Basin or Pipeline Typically by Gravity**
- **Flow Beyond Storage Capacity → Overflow**
  - Overflow Baffle and Screen for Floatables
- **Dewater to Interceptor Over 48-hours based on WWTP, Pump Station and Interceptor Capacity**

# PRELIMINARY DESIGN CHALLENGES

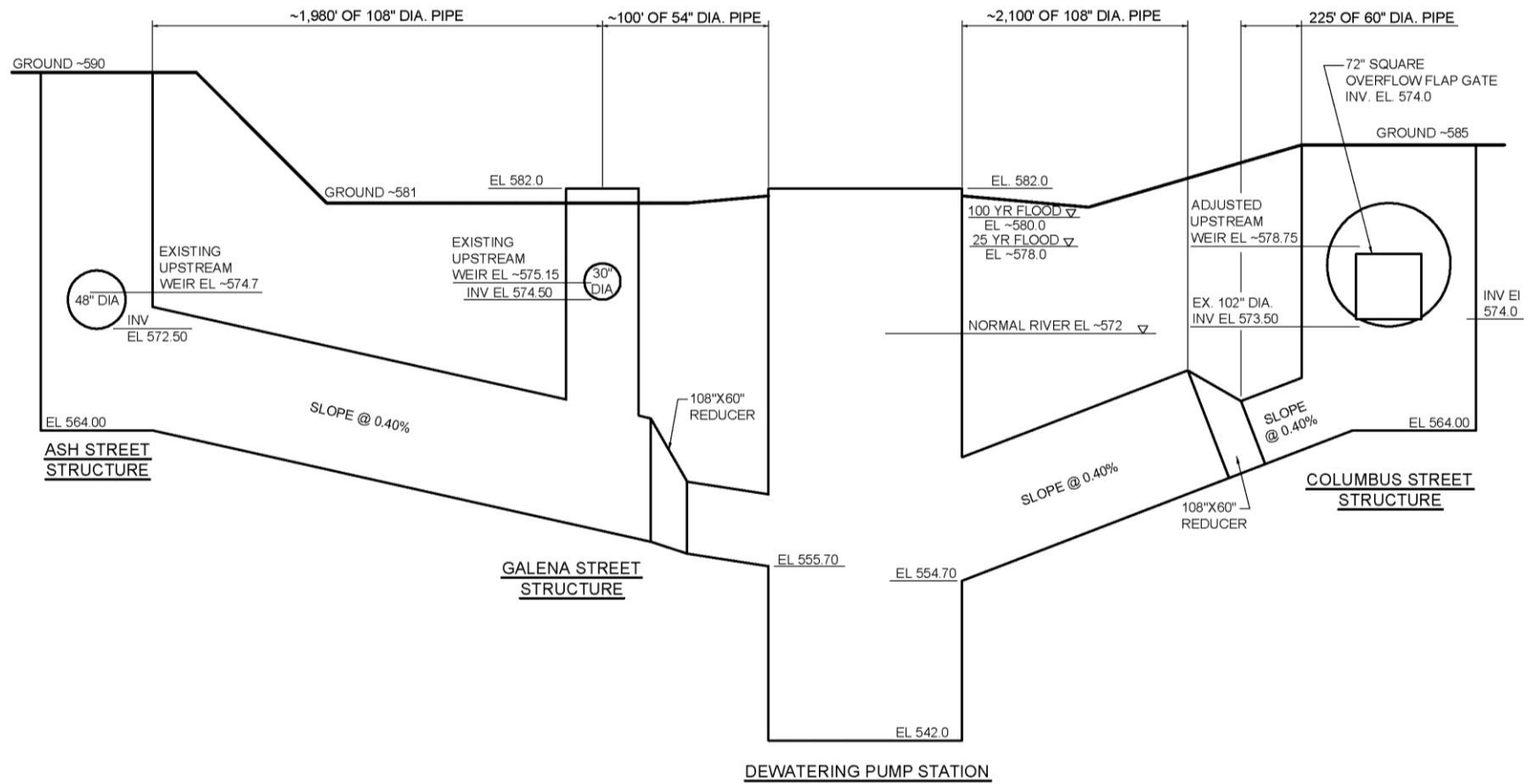
- **SWMM Hydraulic Model Updated/Expanded**
  - 5-year Simulation of Typical Precipitation (1997-2001)
  - Overflow Volume – 2.1 MG
  - < 1 Overflow Typical Year
  - Dewatering PS – 1.6 MGD (Firm)
- **Environmental – Confined Disposal Facility (River Dredgings)**
  - Phase 1 and Phase 2 ESAs
- **Easements**
- **Wetlands Delineation / US Corps Permits / Restoration**
- **Endangered Species Survey**

# DESIGN CONCEPT





# DESIGN CONCEPT



STORAGE PIPELINE PROFILE

# FINAL DESIGN - CHALLENGES

- Buoyancy
- Deposition During Operation
- High Pressure Petroleum Pipeline Crossings
- Multiple Railroad Crossings

# CONSTRUCTION - PROGRESS

- Bid Price \$6,430,010 (\$3.10/gallon)
- 19 Month Construction Schedule
- Substantial Completion Issued
- Consent Decree Milestone Satisfied!
- Change Orders < \$10,000

# CONSTRUCTION - PROGRESS

ASH / COLUMBUS STORAGE PIPELINE



# CONSTRUCTION - PROGRESS

ASH / COLUMBUS STORAGE PIPELINE



# CONSTRUCTION - PROGRESS

ASH / COLUMBUS STORAGE PIPELINE



# CONSTRUCTION - PROGRESS



# CONSTRUCTION - PROGRESS





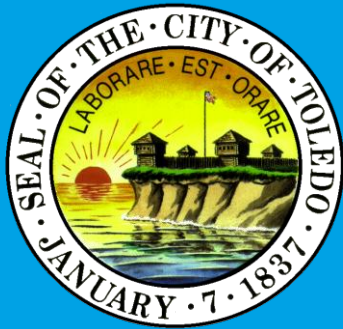
# CONSTRUCTION - PROGRESS



# CONSTRUCTION - PROGRESS

ASH / COLUMBUS STORAGE PIPELINE





Stantec



Building a **world** of difference.®

**Together**



**BLACK & VEATCH**

[www.bv.com](http://www.bv.com)