



# Waller Creek Tunnel Operations

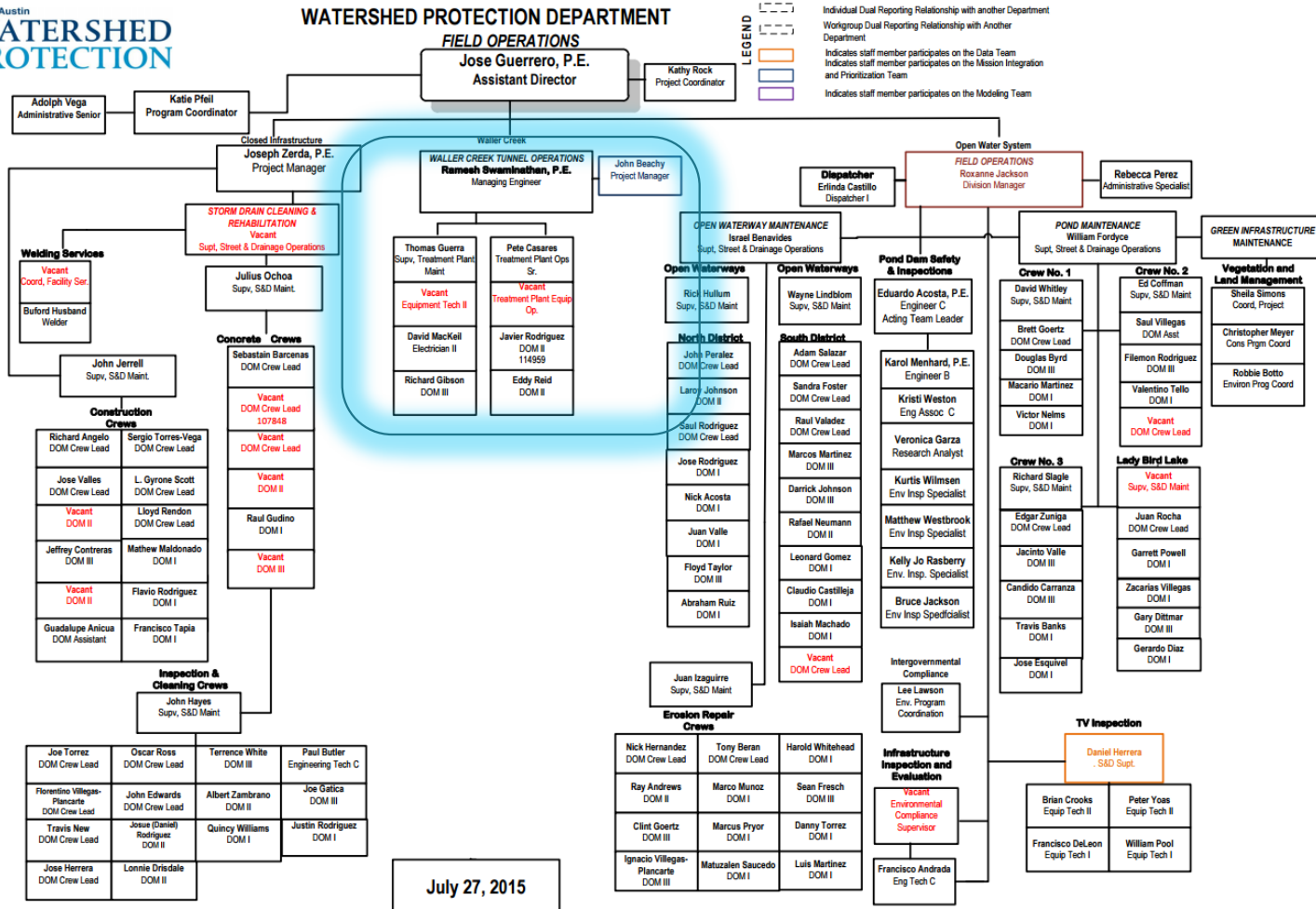
Ramesh Swaminathan, P.E.

Waller Creek Tunnel Operations and  
Maintenance

# Agenda

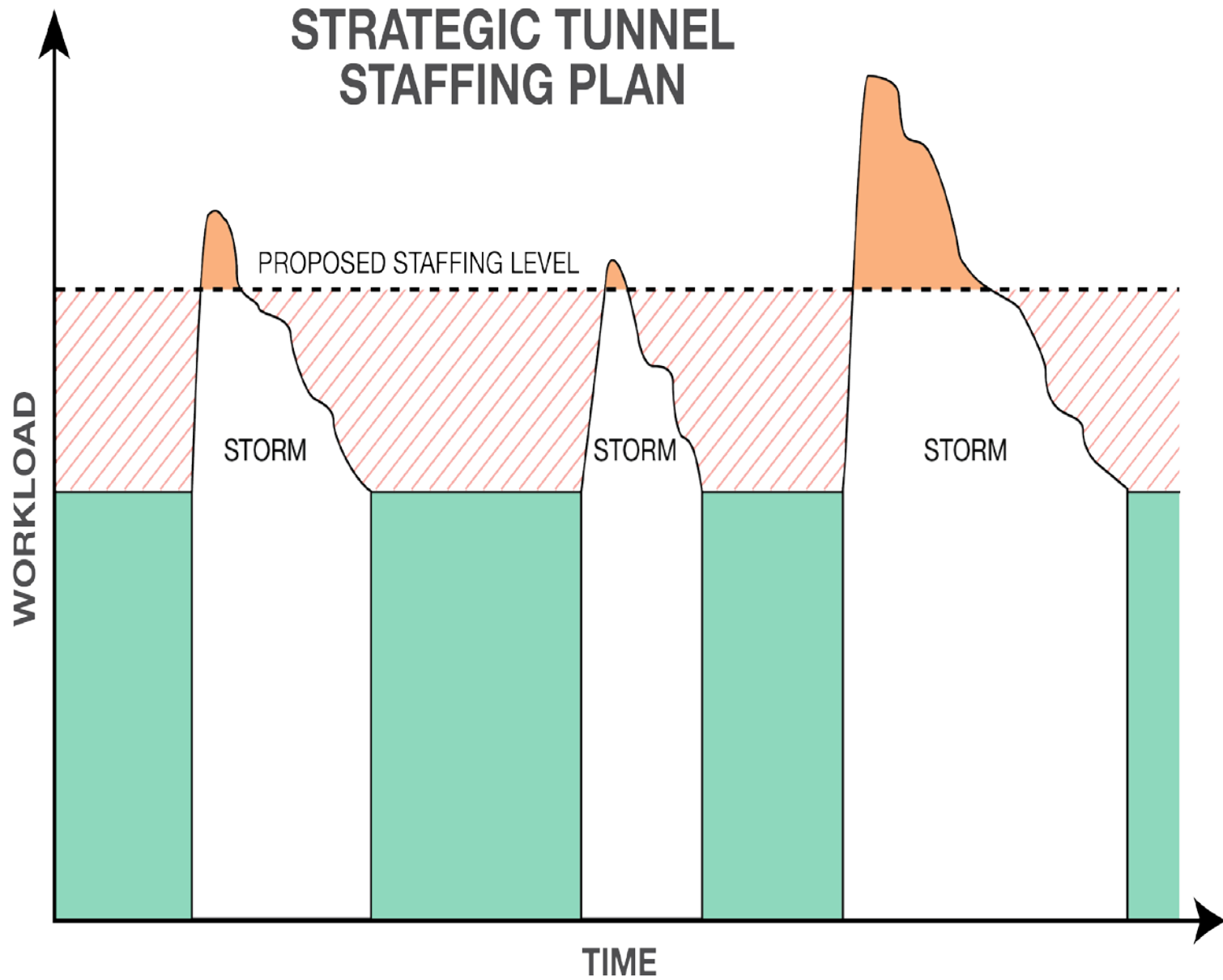
- Introduction
- Tunnel Components and Overview
- Operation Modes
- Maintenance Modes and Methods
- Keep Waller Clean
- Questions and Answers

# WPD Field Operations



July 27, 2015

# STRATEGIC TUNNEL STAFFING PLAN



PREVENTIVE  
MAINTENANCE

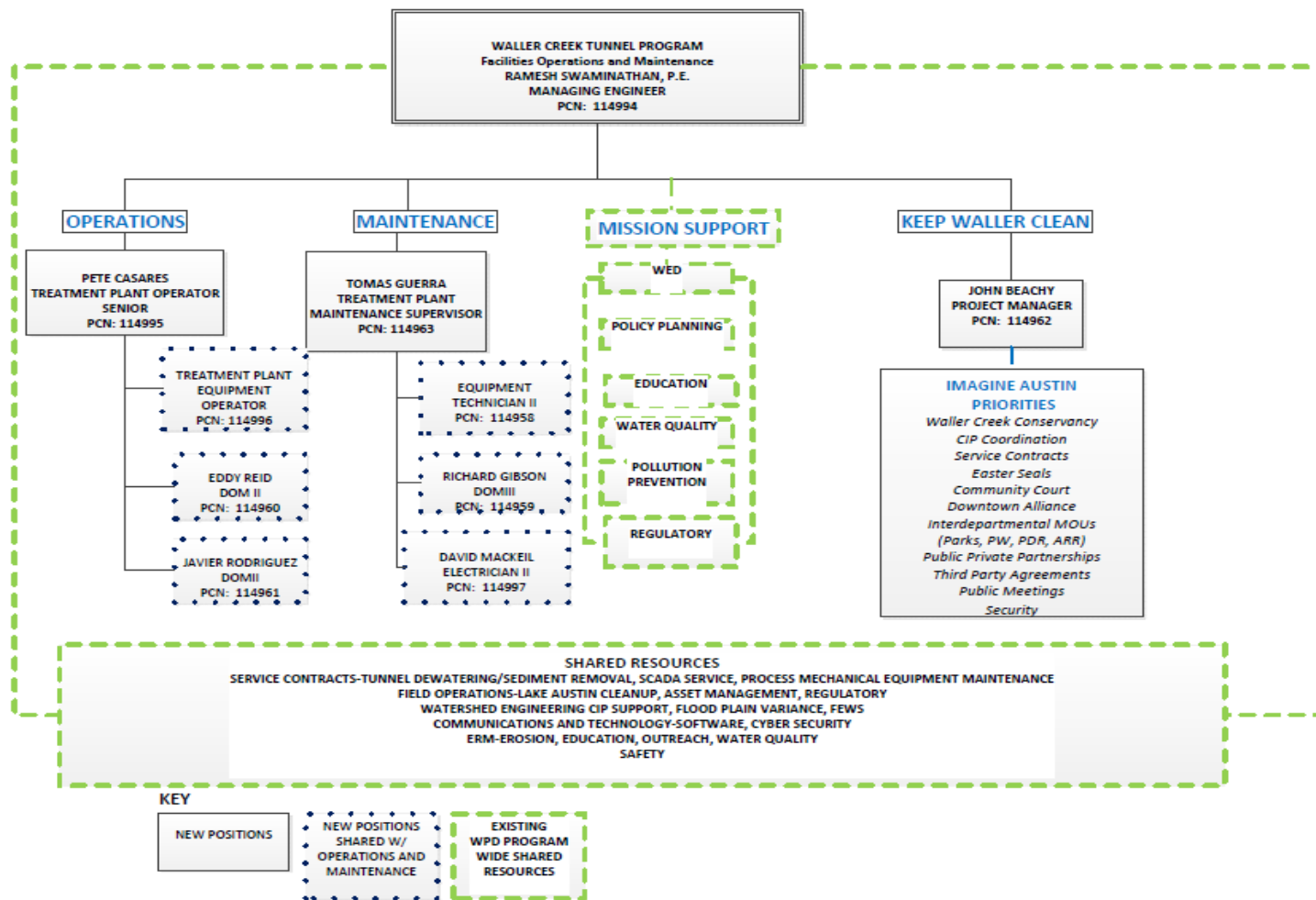


KEEP WALLER CLEAN,  
LBL CLEAN UP, OTHER



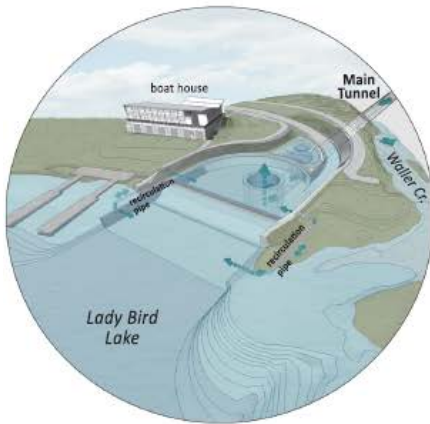
ADDITIONAL "FLEX"  
STAFFING FROM FOD

# Waller Creek Tunnel Org. Chart

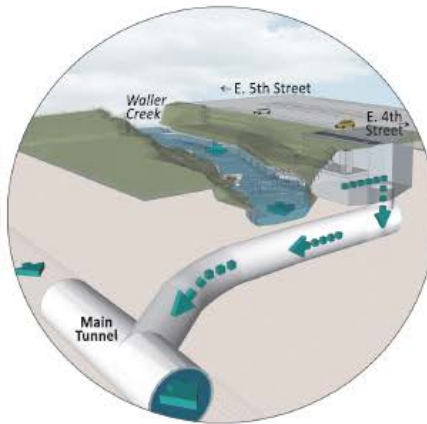




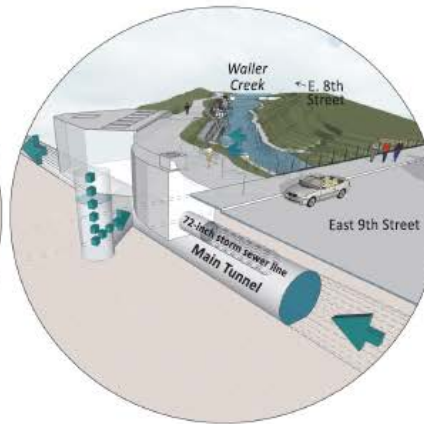
# Waller Creek Tunnel Project



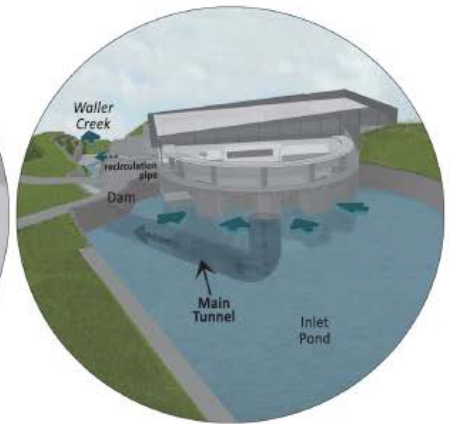
**OUTLET AT  
LADY BIRD LAKE**



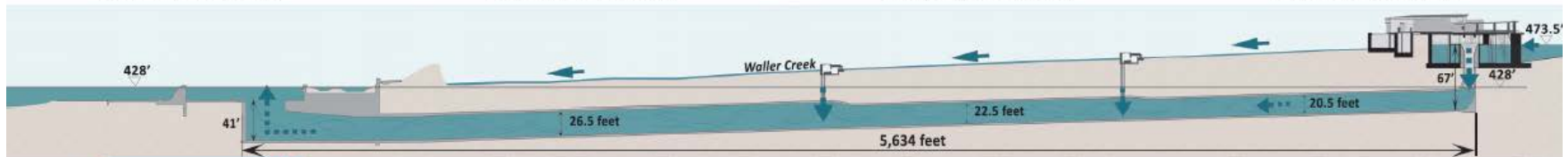
**4TH STREET  
CREEKSIDE INLET**



**8TH STREET  
CREEKSIDE INLET**



**MAIN INLET AT  
WATERLOO PARK**



September 2015

# Tunnel Facts

- 5634 Feet Long (~1.1 Mile)
- Ranges from 22.5 to 26.5 feet diameter
- Full of water at all times.
- 21.5 million gallons
  - 32 Olympic size pools
  - 5 Barton Springs Pools approx.



The architectural drawing illustrates the Morning Glory Structure, divided into two main sections. The upper section is a circular dome-like structure with a central octagonal opening. It features six curved structural elements labeled BS-1 through BS-6. A central area is designated as a 'BREAK / WORK RM' (105). The lower section is a rectangular area containing a 'FACILITY WORKING AREA' (103). This section includes two large vertical structures labeled AUG-001 and AUG-002, each with associated components like MONO-001, BIN-001, BOS-001, and BOS-002. A central 'CL PATH' is shown. The drawing also includes labels for 'PARK POSITION', 'ALT BID', and 'FIN FLR 486.00'. Red arrows point to specific features: BS-1, BS-6, BOS-001PS, BOS-002PS, AUG-001, AUG-002, and the central 'CL PATH' area.

**MORNING GLORY STRUCTURE**

BS-1, BS-2, BS-3, BS-4, BS-5, BS-6

BOS-001PS, BOS-002PS

BREAK / WORK RM (105)

FACILITY WORKING AREA (103)

AUG-001, AUG-002

MONO-001, MONO-001

BIN-001, BIN-002

BOS-001, BOS-002

CL PATH, CL PATH

PATH, PATH

CLEAR ZONE, CLEAR ZONE

PARK POSITION, PARK POSITION

ALT BID

FIN FLR 486.00, FIN FLR 486.00

SR# S-104, CD# C-104

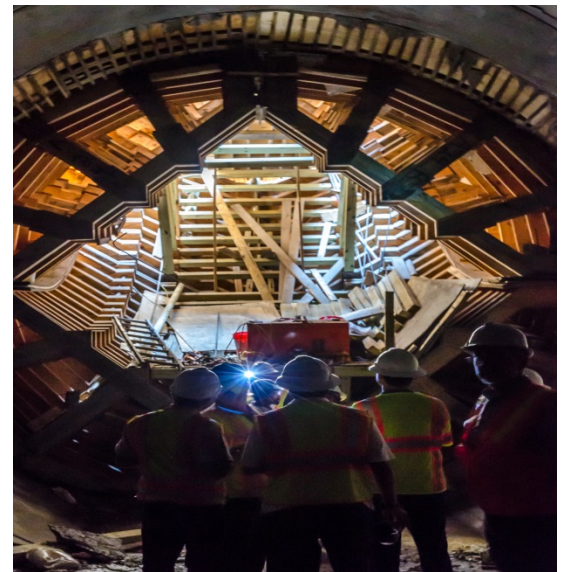
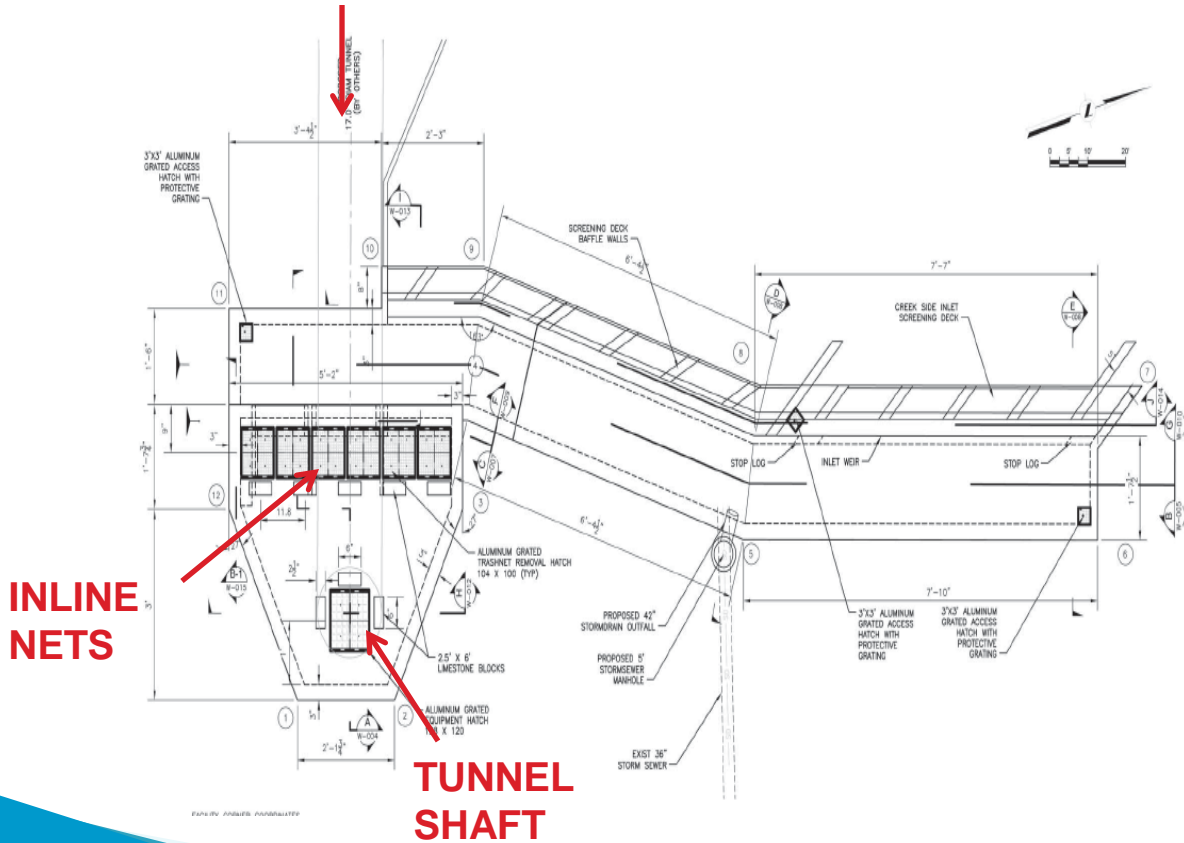
## Lower Wetwell Pump

## Bhosker Screen Cleaners



# 4th Street Connector Tunnel

## CONNECTOR TUNNEL



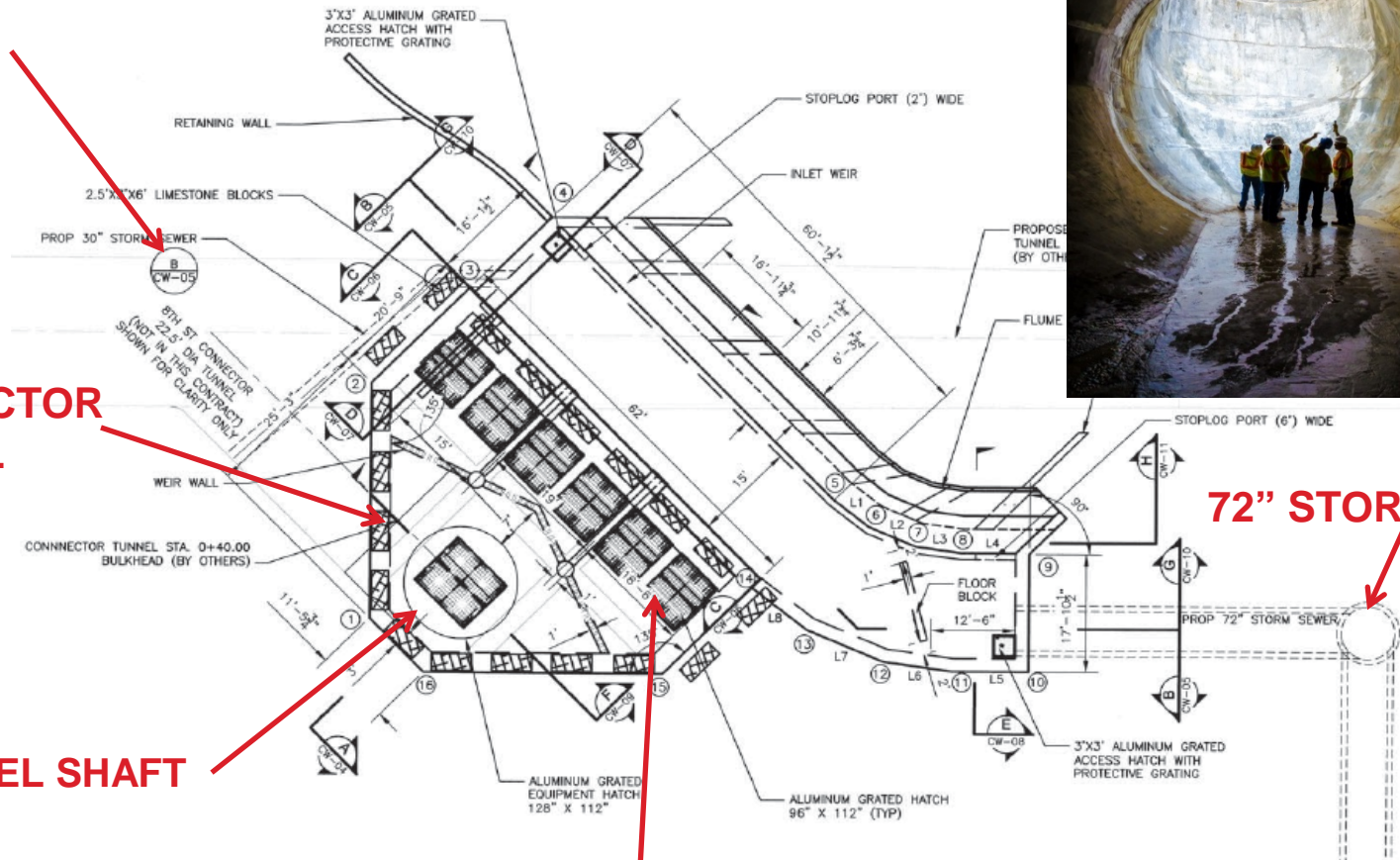
# 8th Street Connector Tunnel

**30" STORM SEWER**

**CONNECTOR  
TUNNEL**

**TUNNEL SHAFT**

**INLINE NETS\***



**72" STORM SEWER**

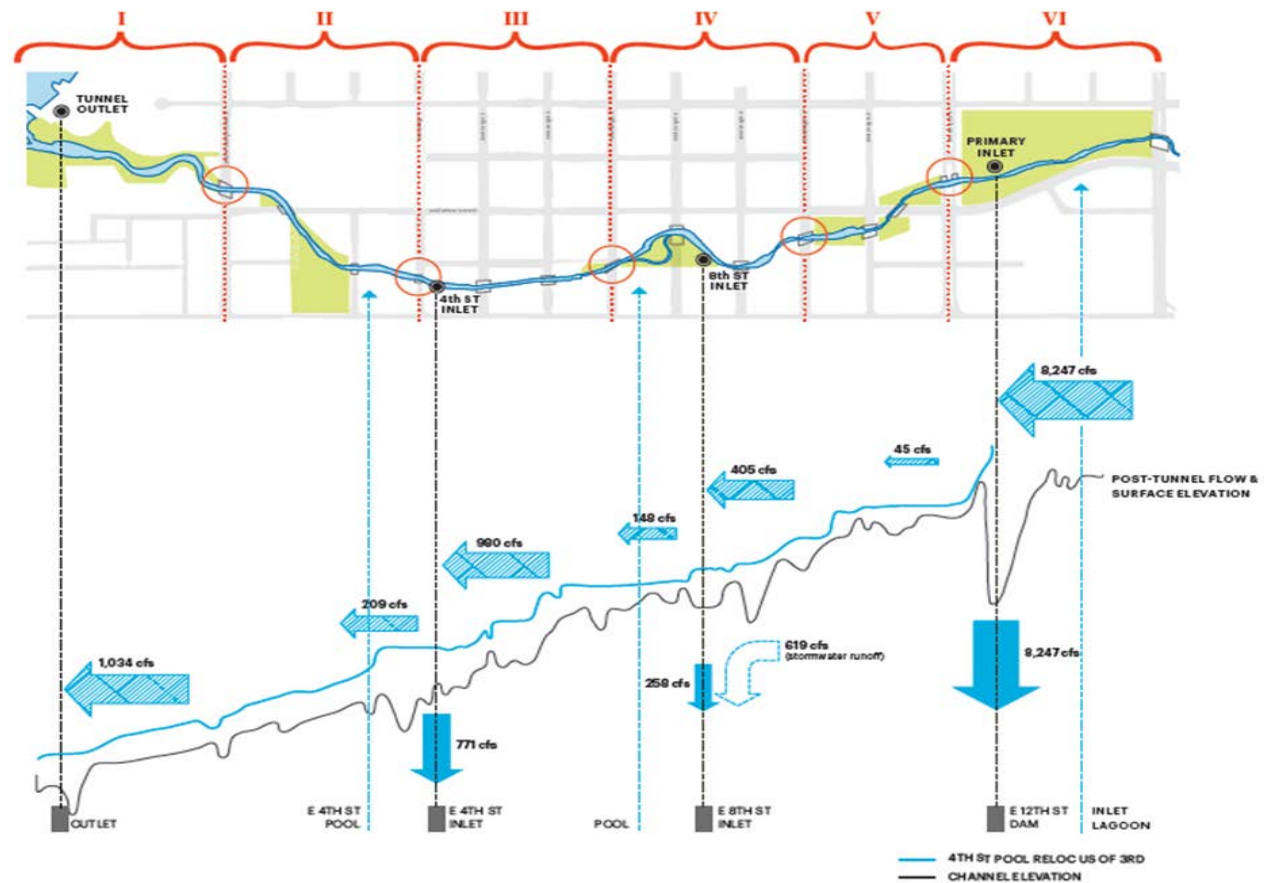


# Outlet



# Post Tunnel Flows

- Flow remains in channel
- Input downstream of Waterloo Park
- This will be dynamic as construction progresses





# Modes of Operation

- Dry Weather
- Interim Operations
- Pre-Storm
- Post Storm
- Tunnel Dewatering



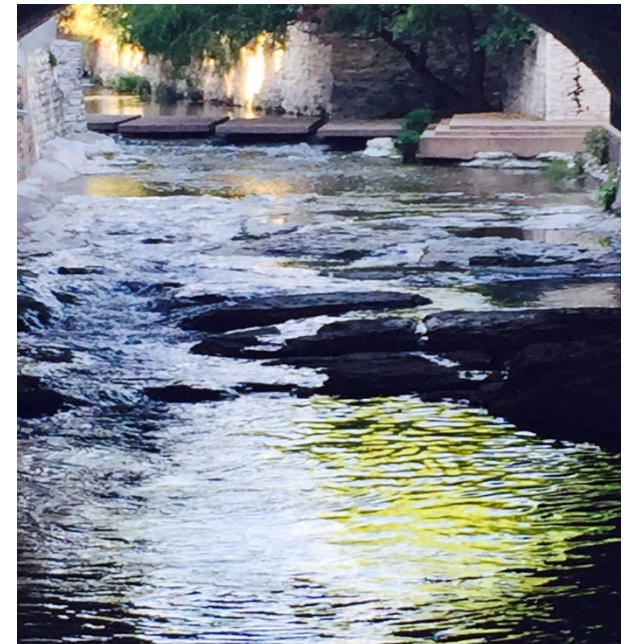
# Dry Weather Operation

- Inlet Facility

- *Contractor Operation with WPD Guidance*

- Recirculation Systems

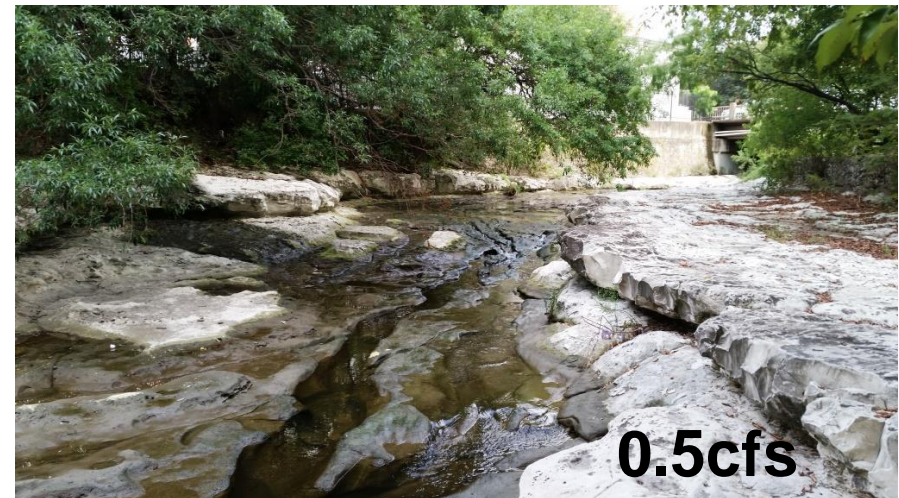
- Lady Bird Lake -> Inlet ->
    - Waller Creek
    - Debris Flushing
    - Inlet Pond
    - Pond Screen Waterfall
    - Wetland and Dam Waterfall
  - *One 11 CFS Pump*



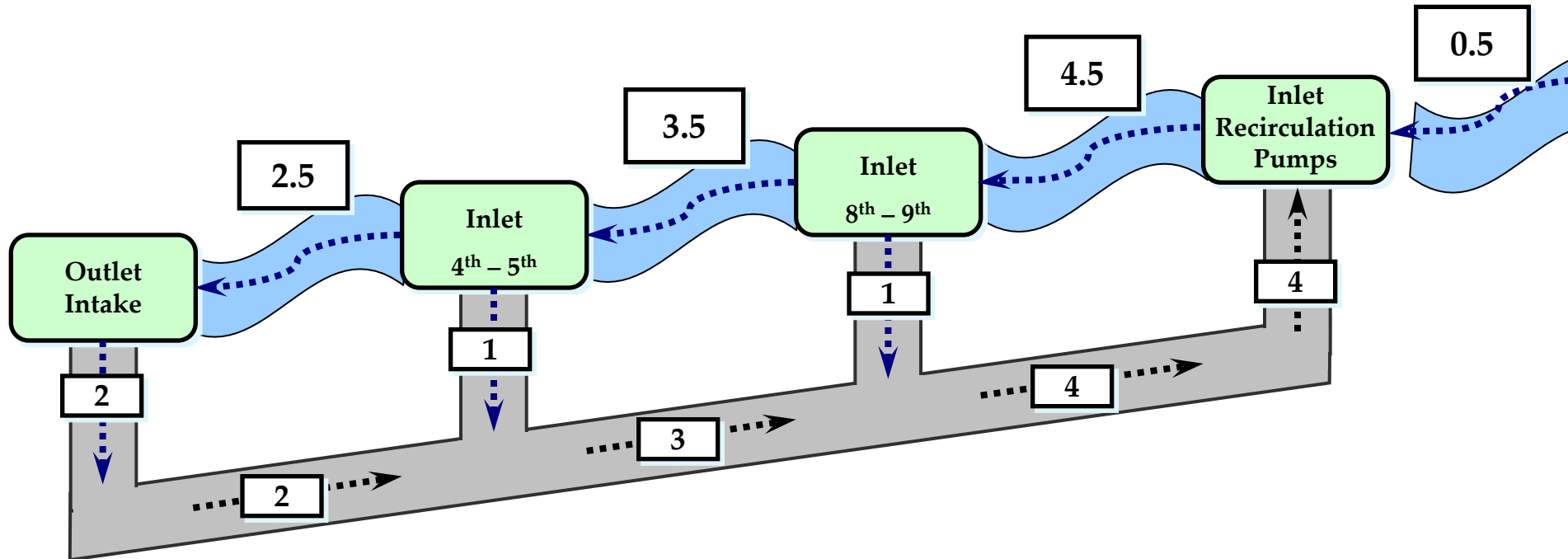


# Dry Weather Operation

- Flow Management
  - *Temporary Flow Elements*
  - USGS Gauges (Koenig, Redriver, Cesar Chavez)
  - COA (23<sup>rd</sup> Street)
- LCRA Firm Water Contract
- Water Quality Monitoring
  - *DO Measurement*
    - *Taken daily*
  - *Interim DO Management Options*



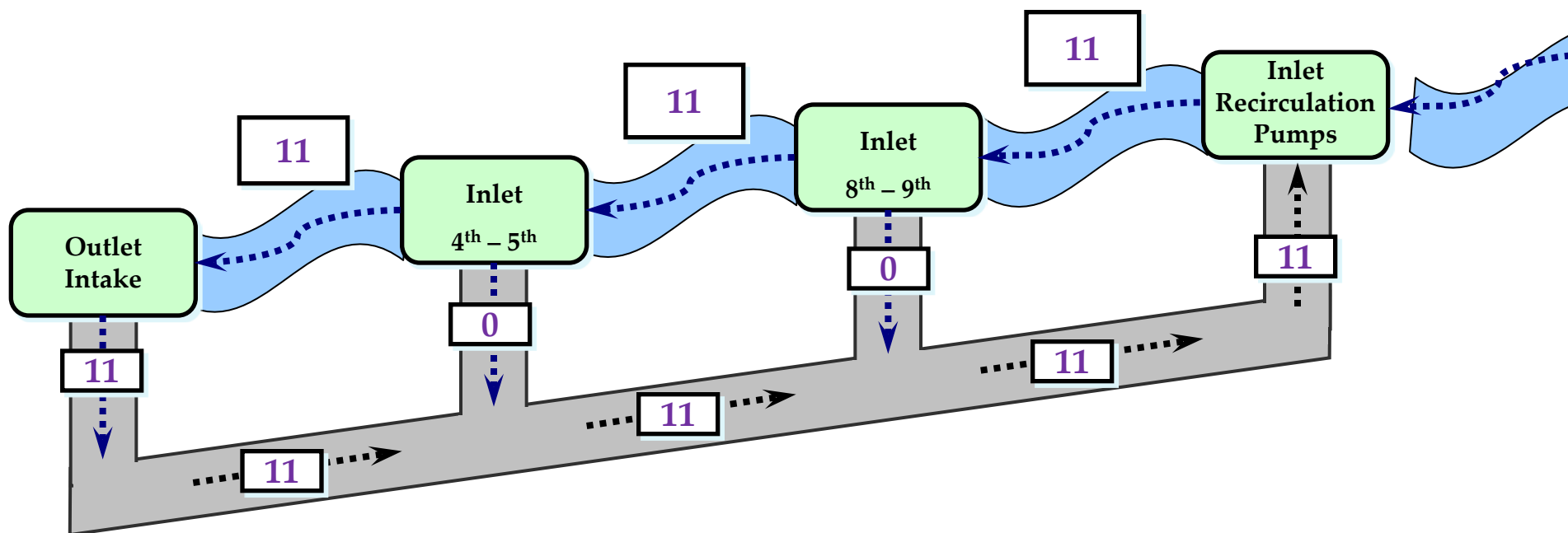
# Adaptive Flow Management



**X** = FLOW in cubic feet per second (cfs)



# Adaptive Flow Management (*Interim*)



**X** = FLOW in cubic feet per second (cfs)

# Dry Weather Maintenance

- Preventive Maintenance
- Major Mechanical Equipment
- Electrical SCADA Equipment
- Corrective Maintenance



# Upstream Preventive Maintenance

- Waller Creek at 15th street
  - Upstream Preventive Maintenance
  - 86 Tons (wet) Removed
  - \$7000 (+/-) tracked in Maximo





# Wet Weather Operations





# Inlet Facility Debris Management

- Debris Management
  - Weather Dependent First Flush
  - Estimated Debris Per Year:
    - 156 Tons (est);
    - 60 % of Lady Bird Lake Trash Pickup: 250 Tons
  - Actual: Approx. 275 Tons (To date)
  - Onsite Trash Compaction

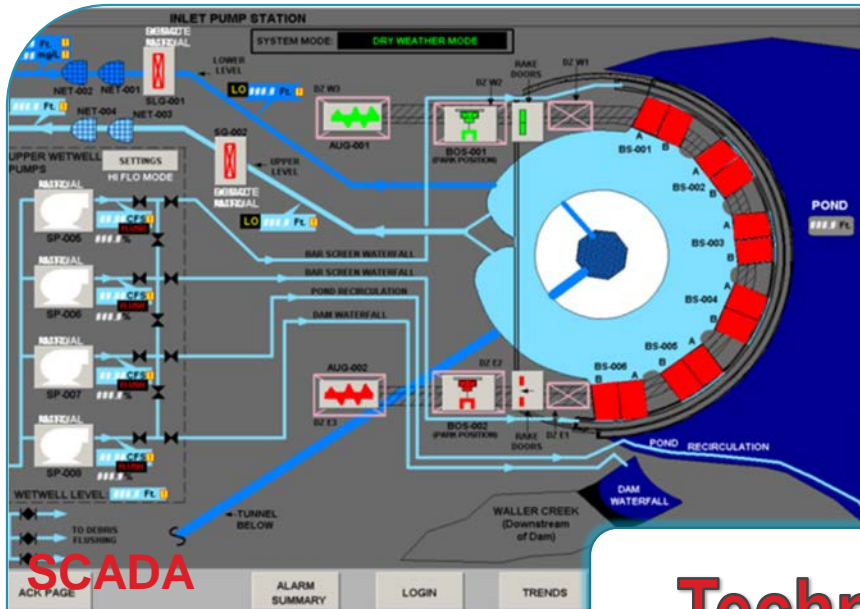


# Post Flood Operations

- Tunnel Water Quality Rapid Recirculation
  - Evacuate tunnel water to preserve oxygen levels
  - Up to 28 CFS depending on Lake Levels
    - *Interim 11 CFS + Additional Pumping as required*
- Debris Management
  - Side Weir Inlets
    - *Interim Closed*
  - Debris in creek downstream of 12<sup>th</sup> street dam.
    - *Easterseals, Community Court etc*

# Tunnel Dewatering

- Why Dewater the tunnel?
  - Maintain the hydraulic function of the tunnel
  - Inspect the condition of the tunnel
- First dewatering will occur within the 1 year warranty period
- Perform any future facility upgrades during dewatering

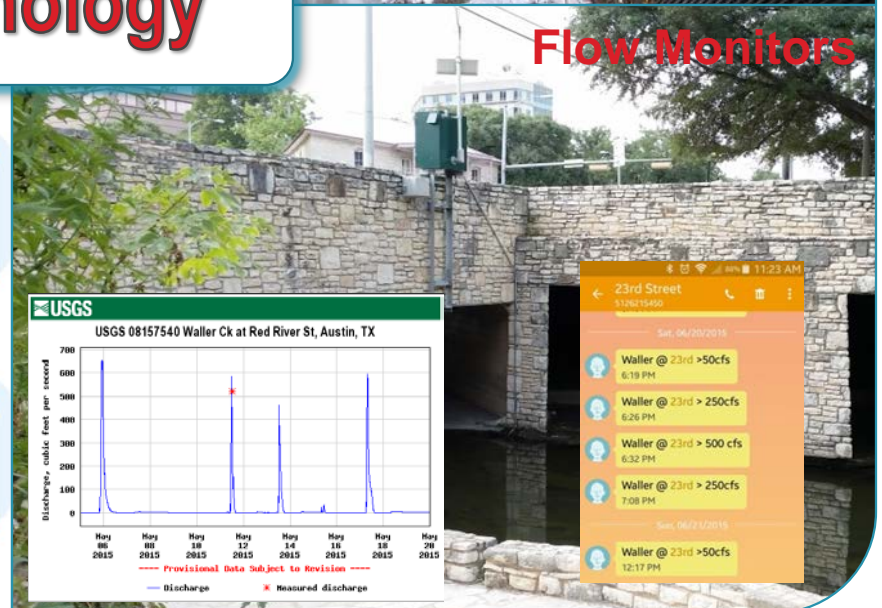


# Technology

Maximo



Flow Monitors





# Shared Resources/Cross Training

## •Strategies and Work Plan

- All new field staff embedded with FOD work groups

- Performing FOD Tasks
- Approx. 1000 MHrs
- Cross Training to learn WPD-FOD methods
- Acquire licensing and certifications



- Assume specific tasks and or Projects
  - Waller Creek at 15<sup>th</sup> Street
  - Storm Readiness On Call Duties
  - Lady Bird Lake Cleanup
  - Keep Waller Clean
  - Side Inlet Filters

# Waller Creek Watershed-Keep Waller Clean

- Waller Creek Watershed District Maintenance
- Lower Waller Creek Side Inlet filters
- Public Private Partnerships
  - Keep Austin Beautiful
  - Education Programs
  - Easter Seals
  - Community Court
  - University of Texas







**QUESTIONS ?**