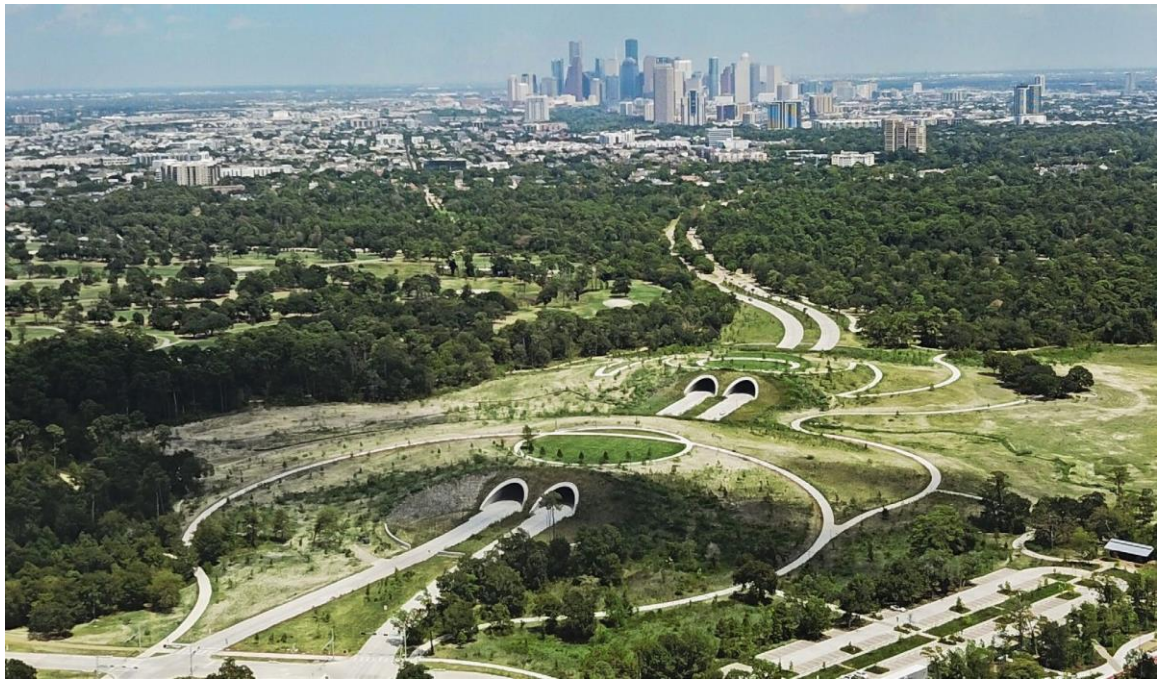
Sustainable Solutions

Learnings from Navigating the Green Infrastructure/Low-Impact Development Landscape

(GI) (LID)

Greenrise Technologies

Who is Greenrise?



- Headquartered in Nashville
  - Acquired Construction EcoServices in 2022
- Offices in TN, TX, NC, SC, LA, AL
- 21 Years of Stormwater Pollution Prevention & Erosion and Sediment Control
- 17 Years of Underground Detention & Stormwater Quality
- 17 Years of Green Roof
- 15 Years of Low Impact Development
- 13 Years of Stormwater Quality Maintenance

Greenrise Technologies

Goals of LID (according to Ish)

- Mimic predevelopment hydrology
  - Reduce runoff velocities (peak flow rate)
  - Reduce runoff volume (water quantity)
  - Promote infiltration/groundwater recharge
- Conserve natural features
- Improved aesthetics + community well-being
- Cost-efficiency
- **Water Quality!!!**

Greenrise Technologies

Why LID?

- Increased Lot Yield
- Lower Overall Cost of Development
- Increased Revenue
- No Design/Construction Delays

Greenrise Technologies


Camellia

Camellia by Legend Homes

- Typical Lot Size – 50’ x 110’
- Located in Fort Bend County, Texas (SW of Houston)
- 80 Acres for Single Family Development
- Amenity on Every Lot (or nearly every lot)

Greenrise Technologies

Conventional Land Plan

- Must provide detention developed flows of the 100-year storm event
- Due to County Criteria, only minimal detention volume can be provided “above” amenity basin
- Remaining detention volume provided in a separate basin

Greenrise Technologies


SPEED LIMIT
30

LID Approach

- 323 lots
- 99% of lots are amenitized by location on green space
- Rain gardens located in the median of residential roadways
- Yes…there are variances required, but they were obtained for this project

Greenrise Technologies

Side by Side Comparison

Conventional

- 224 lots

LID

- 323 lots
- 99 more lots = 44% increase

	Conventional	LID	
Total	**$7,770,567**	**$6,833,372**	**Savings**
Per Acre	$97,132	$85,417	$11,715
Per Lot	$34,690	$21,156	$13,534

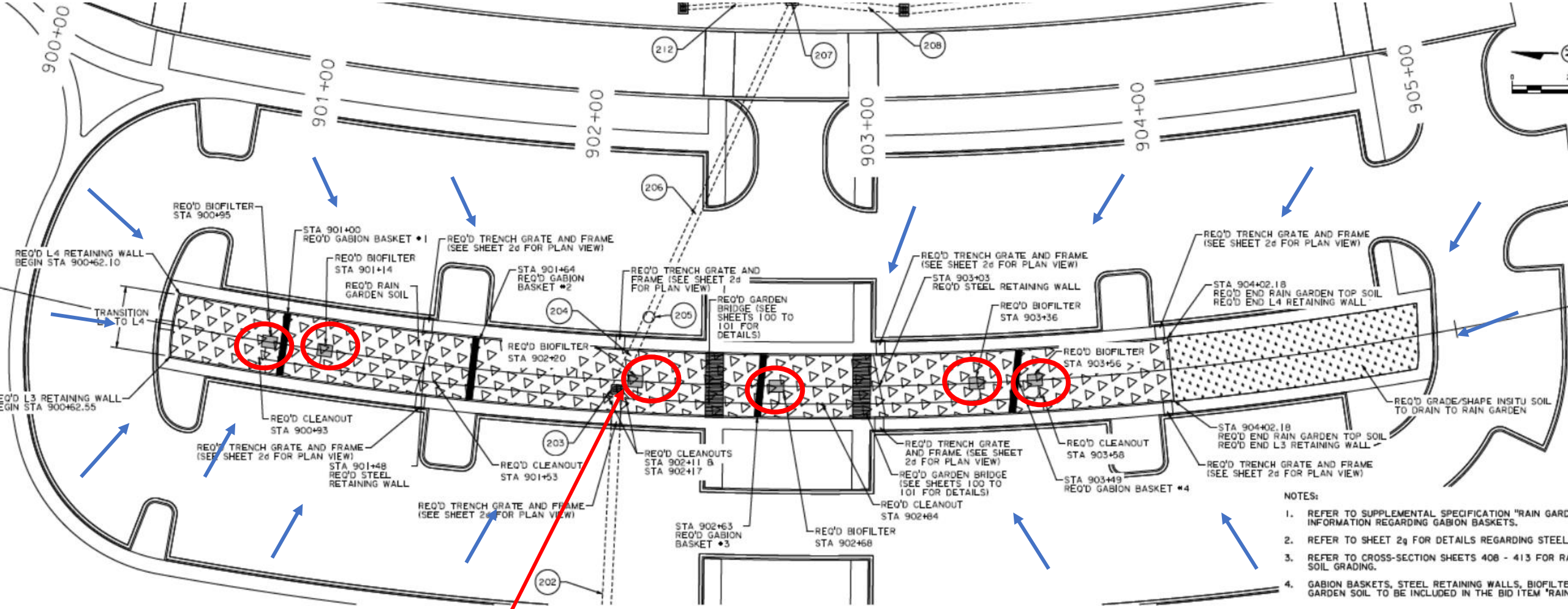
Greenrise Technologies

Biggest Takeaway

LID/GI must be intentional and implemented intentionally

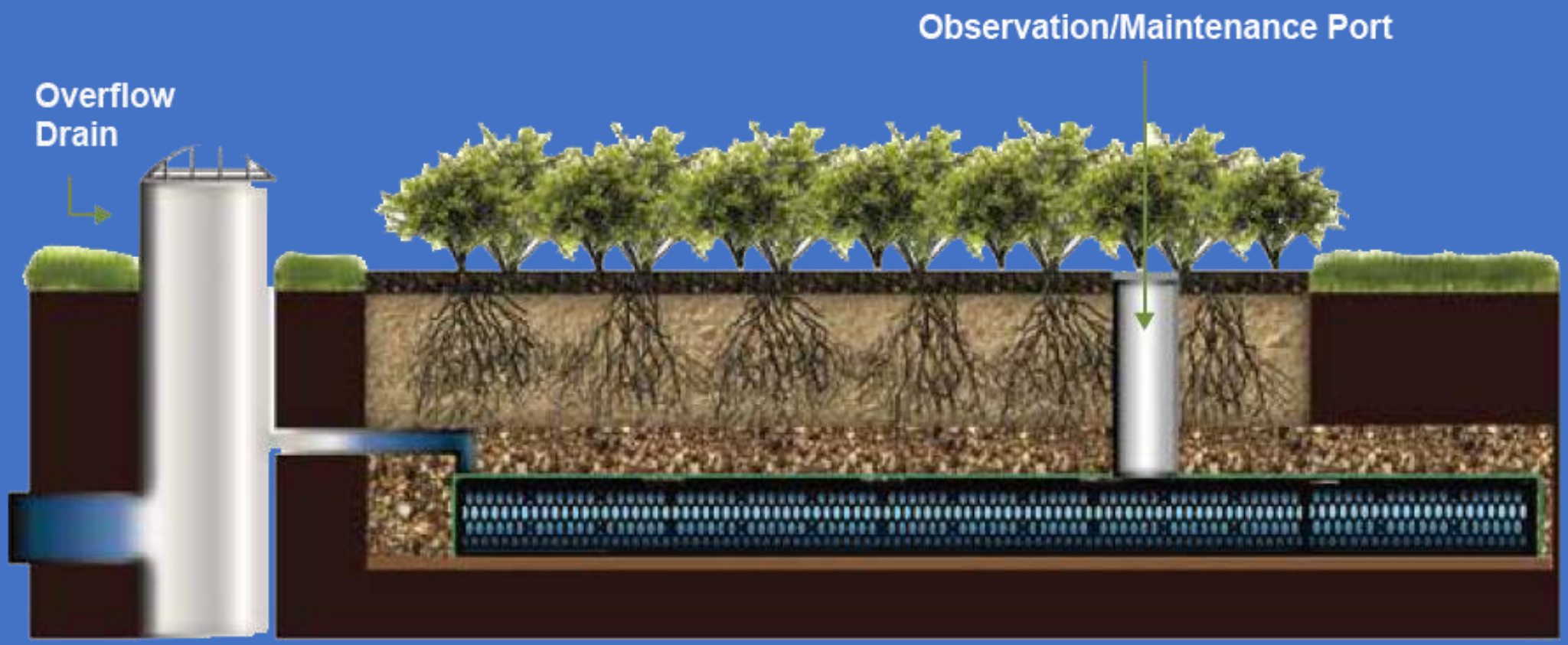
Greenrise Technologies

Greenrise Technologies



Overflow Structure

Greenrise Technologies



Greenrise
Technologies

Biggest Takeaway

LID/GI maintenance is simple, cost-effective, and practical, but extremely necessary

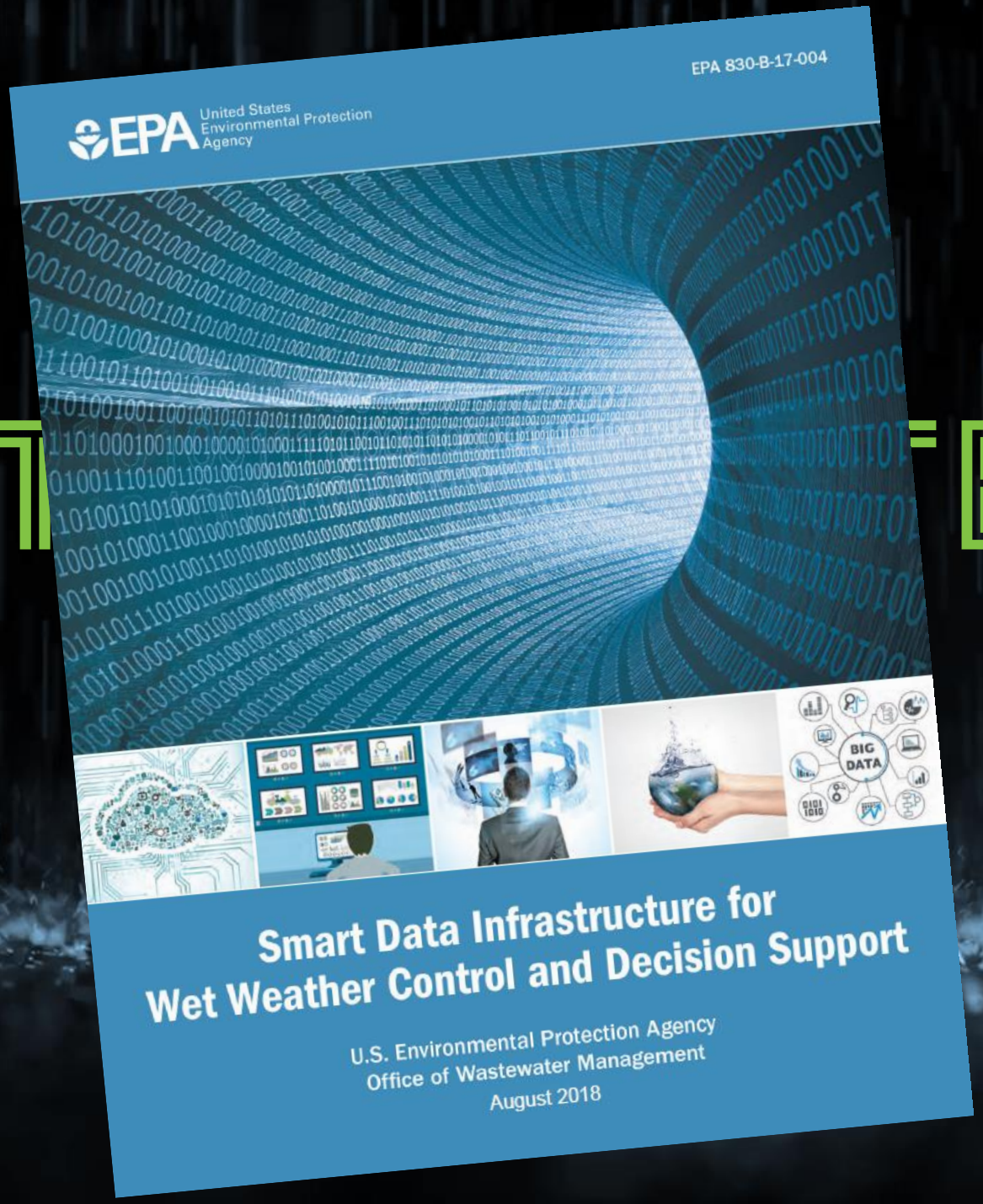
Greenrise Technologies

So what’s next?

Greenrise Technologies


SMART
HOUSE
SECURITY

ST FER

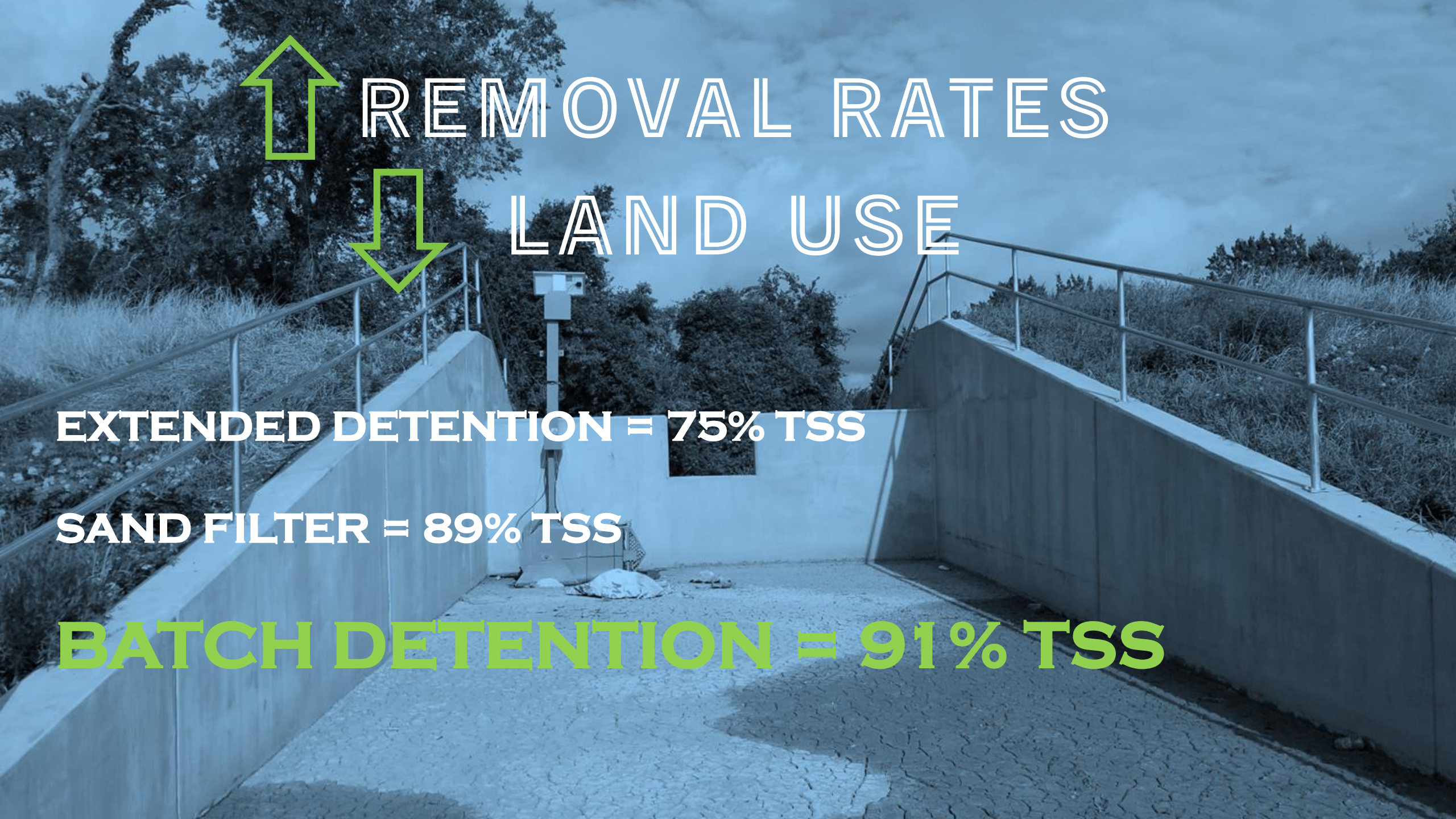

EPA United States Environmental Protection Agency
EPA 830-B-17-004
BIG DATA
Smart Data Infrastructure for Wet Weather Control and Decision Support
U.S. Environmental Protection Agency
Office of Wastewater Management
August 2018

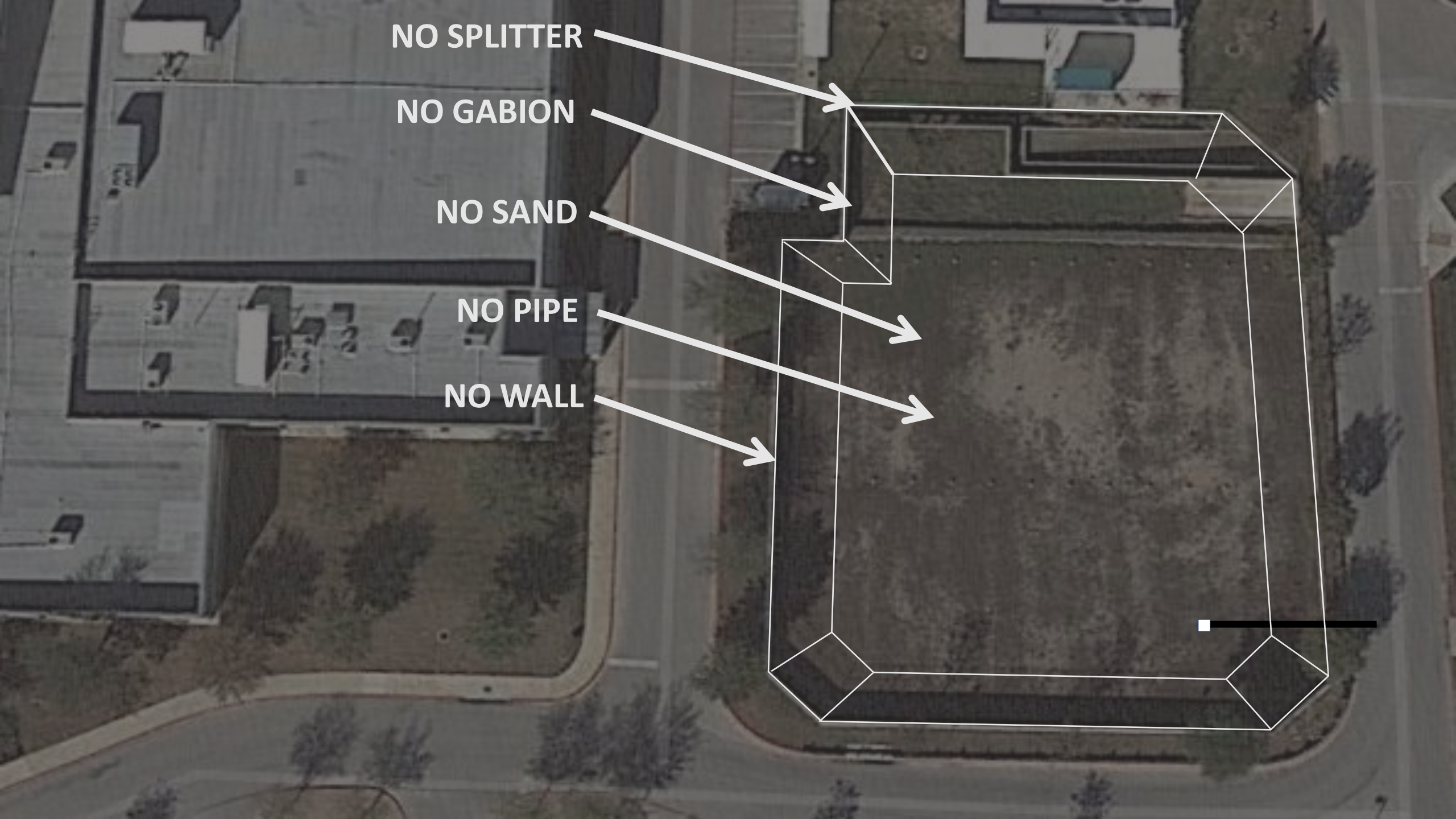
Batch Detention - TCEQ RG-348

A batch detention basin is an **extended detention basin modified to operate as a batch reactor.** A valve on the first detention basin outlet is used to capture the produced runoff for a fixed amount of time and then release it. As in an extended detention basin, the Technology batch detention basin is primarily used to remove particulate pollutants and to reduce maximum runoff rates associated with development to their pre-development levels. Batch detention basins have **superior water quality** performance than traditional extended detention basins and achieve a total suspended solids **(TSS) removal efficiency of 91%**. (Middleton et al., 2006).

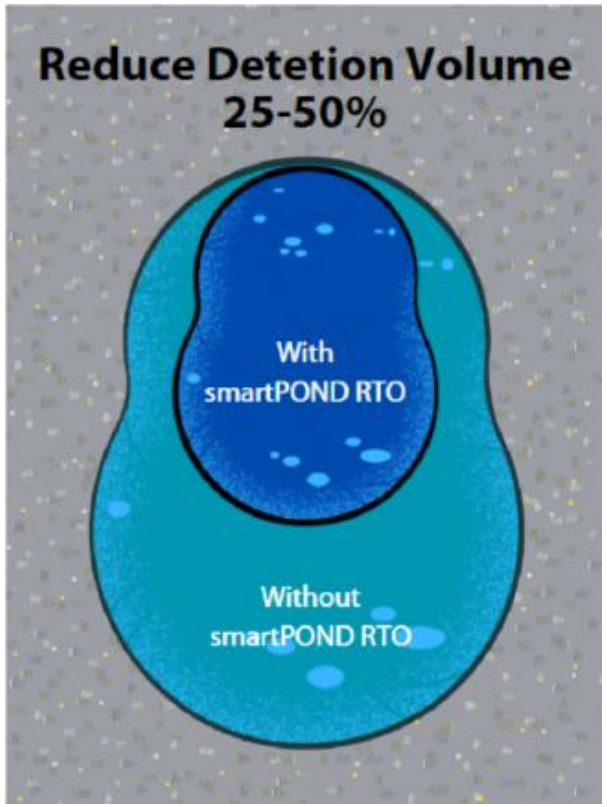
These devices **require less area and hydraulic head than sand filters** and provide similar TSS removal. The detention basins may be berm-encased areas, excavated basins, or buried tanks, although the latter are not preferred in most situations (below grade configurations will only be acceptable for sites of less than 5 acres).

Greenrise Technologies


REMOVAL RATES
LAND USE
EXTENDED DETENTION = 75% TSS
SAND FILTER = 89% TSS
BATCH DETENTION = 91% TSS


NO SPLITTER
NO GABION
NO SAND
NO PIPE
NO WALL

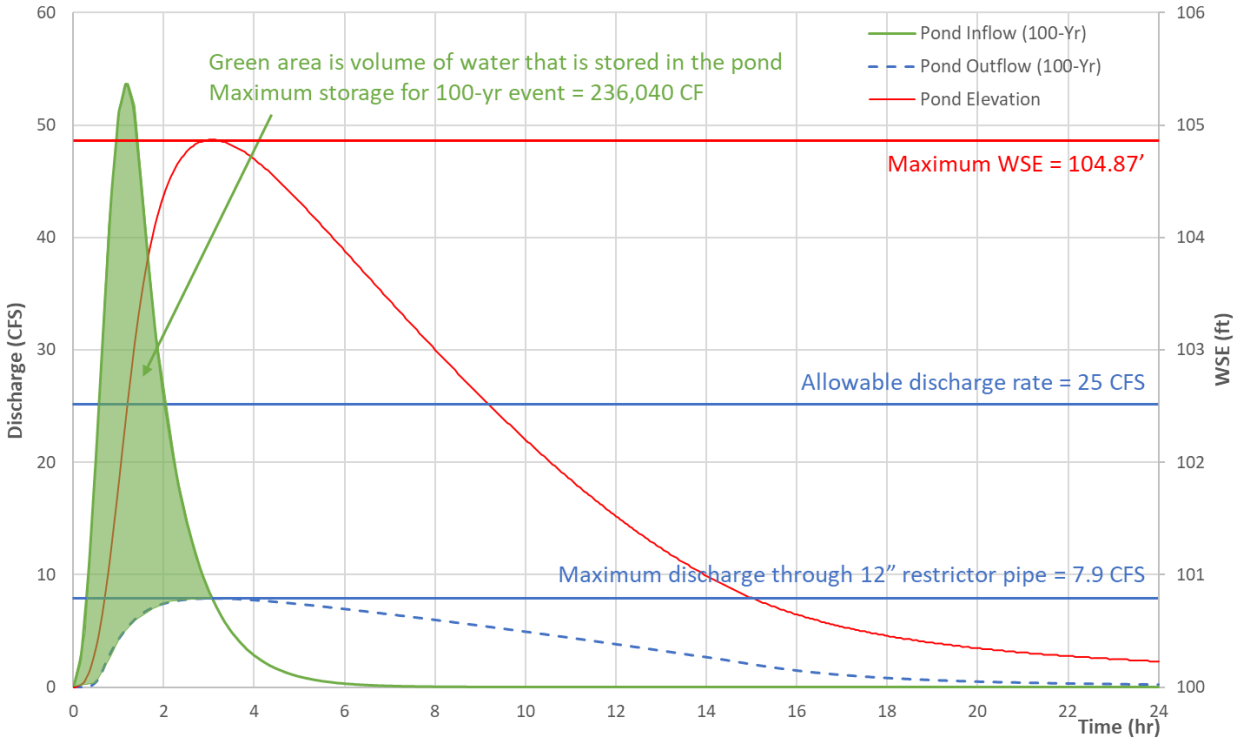
Real-time optimization (RTO)



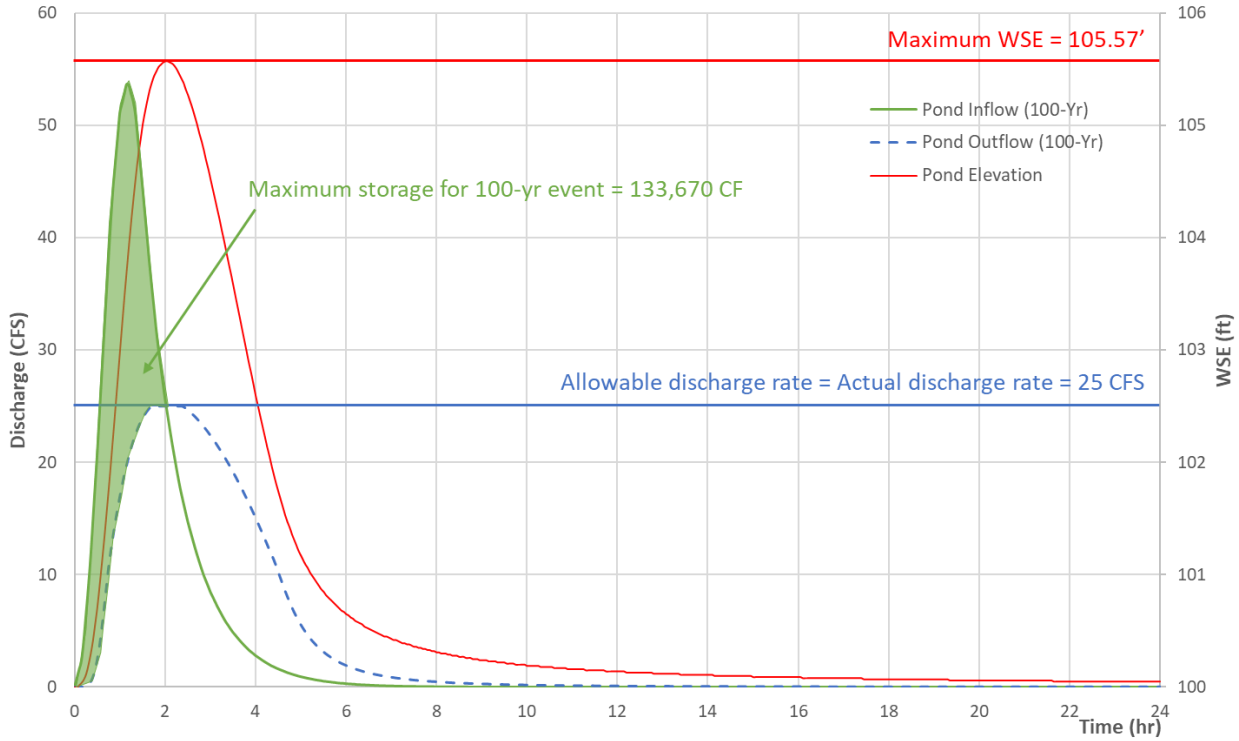
Greenrise Technologies

Optimized Detention Design

- Traditional outlet control



- Real-time optimization



Greenrise Technologies

Thank You!

ikhan@greenrisetech.com

713-818-7469

Greenrise Technologies