PARK WEST DRAIN

GREEN INFRASTRUCTURE PROJECT

FISHBECK, THOMPSON, CARR, & HUBER INC.

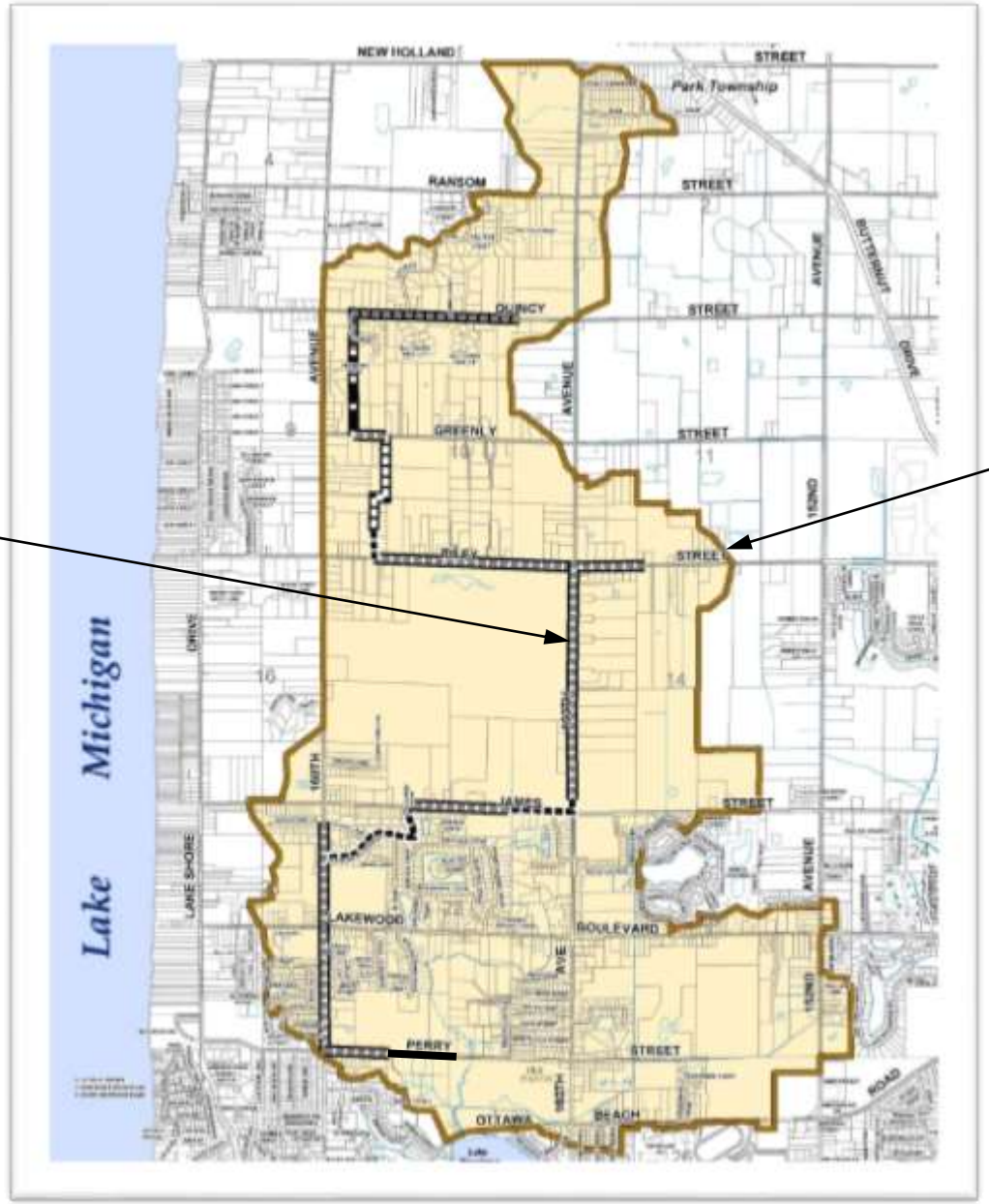
Joe Bush

Ottawa County Resources Commissioner

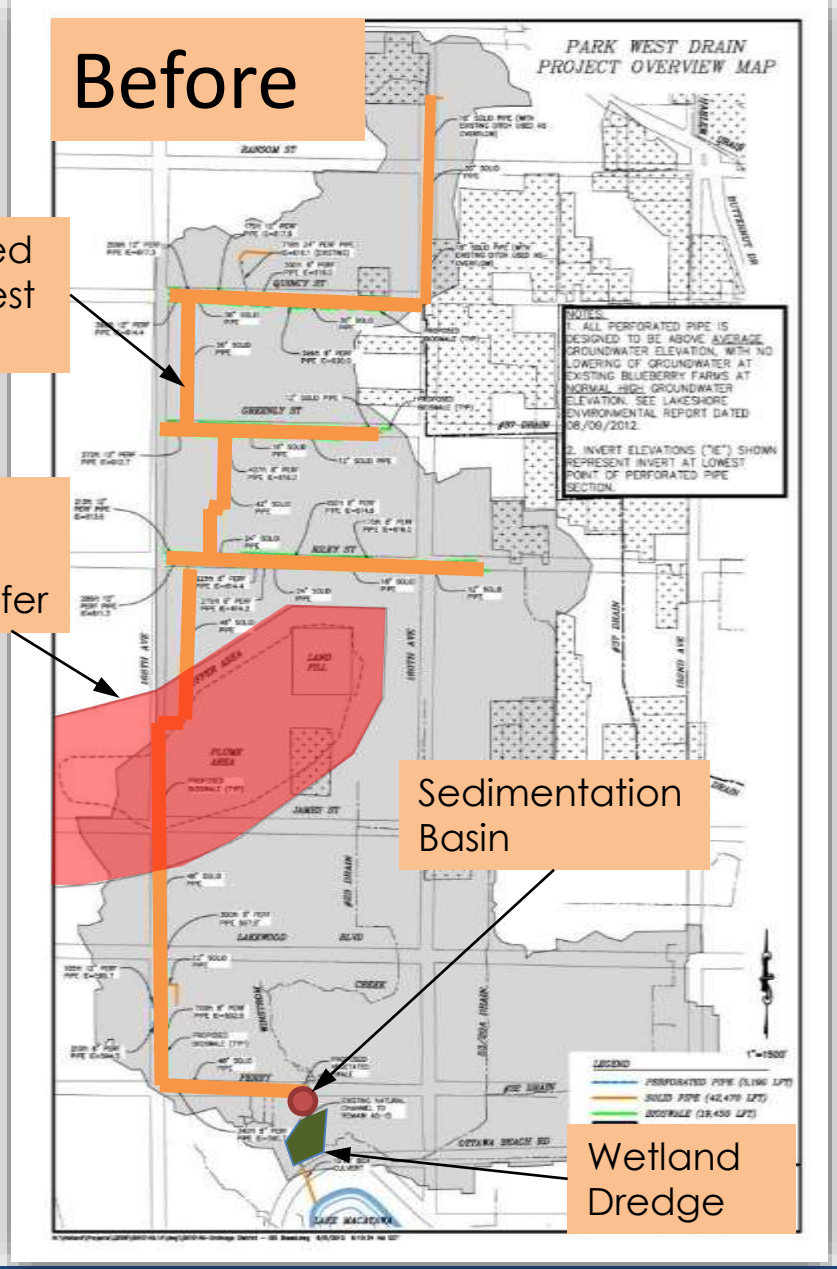
Brian McKissen, PE, CFM

FTCH

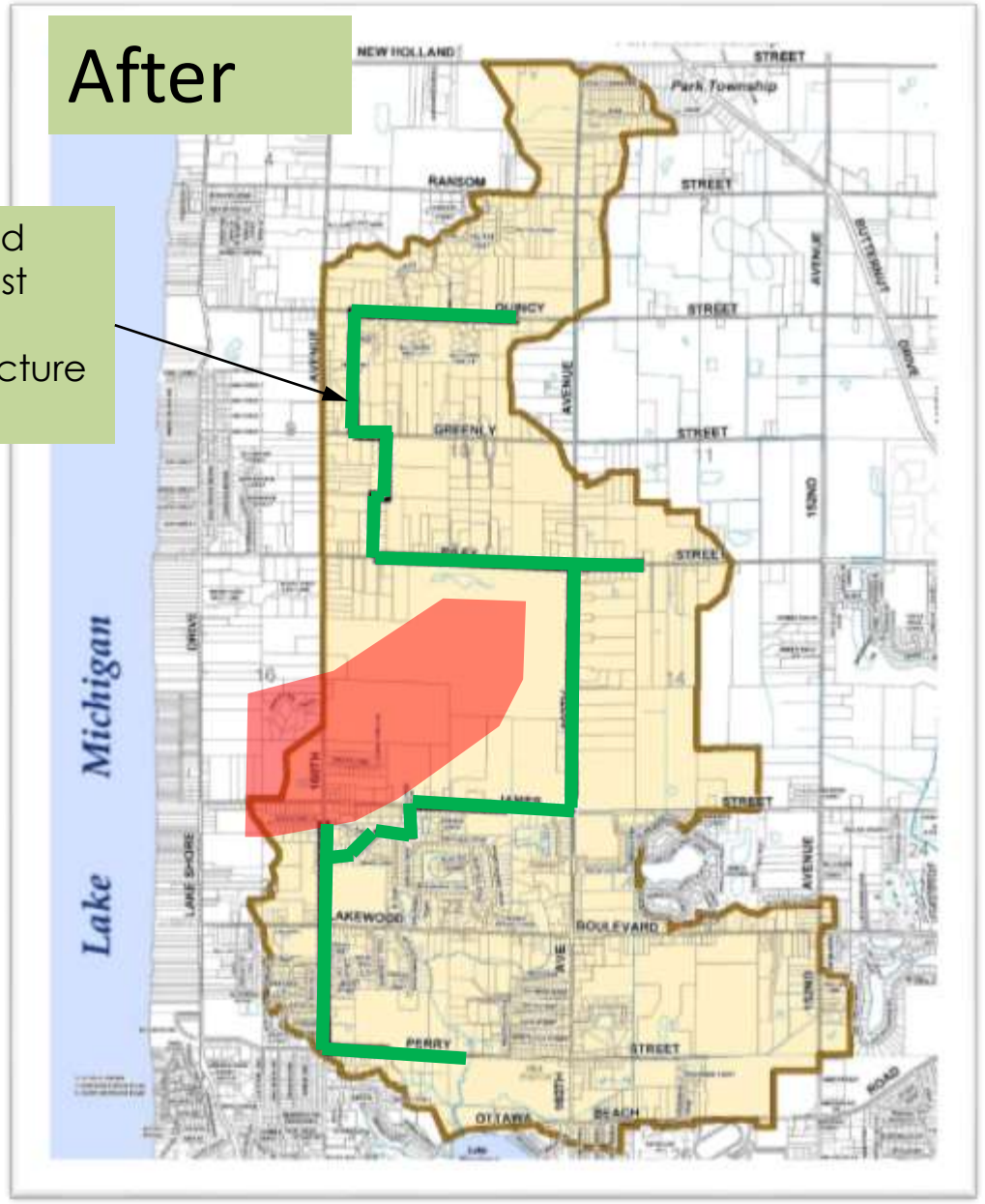
Ottawa County, Michigan


Park West Drain
Park West Drainage District
Lake Michigan
NEW HOLLAND
Park Township
RANSOM
QUINCY
GREENLY
RILEY
JAMES
AKEWOOD
PERRY
OTTAWA BEACH
STREET
AVENUE
BOULEVARD
DRIVE
LAKE SHORE
ROAD

Before



After



Park West Drain Plan

- High groundwater
- Flooding
- Recirculating sump pumps
- Township petition

- Traditional drain concept
- Green infrastructure drain concept
- Community concerns
- SAW grant

- SAW grant received from MDEQ
  - Testing and demonstration of innovative technology (only one awarded in the state)
    - 1.7 million dollars
  - Low interest loan to finance remainder

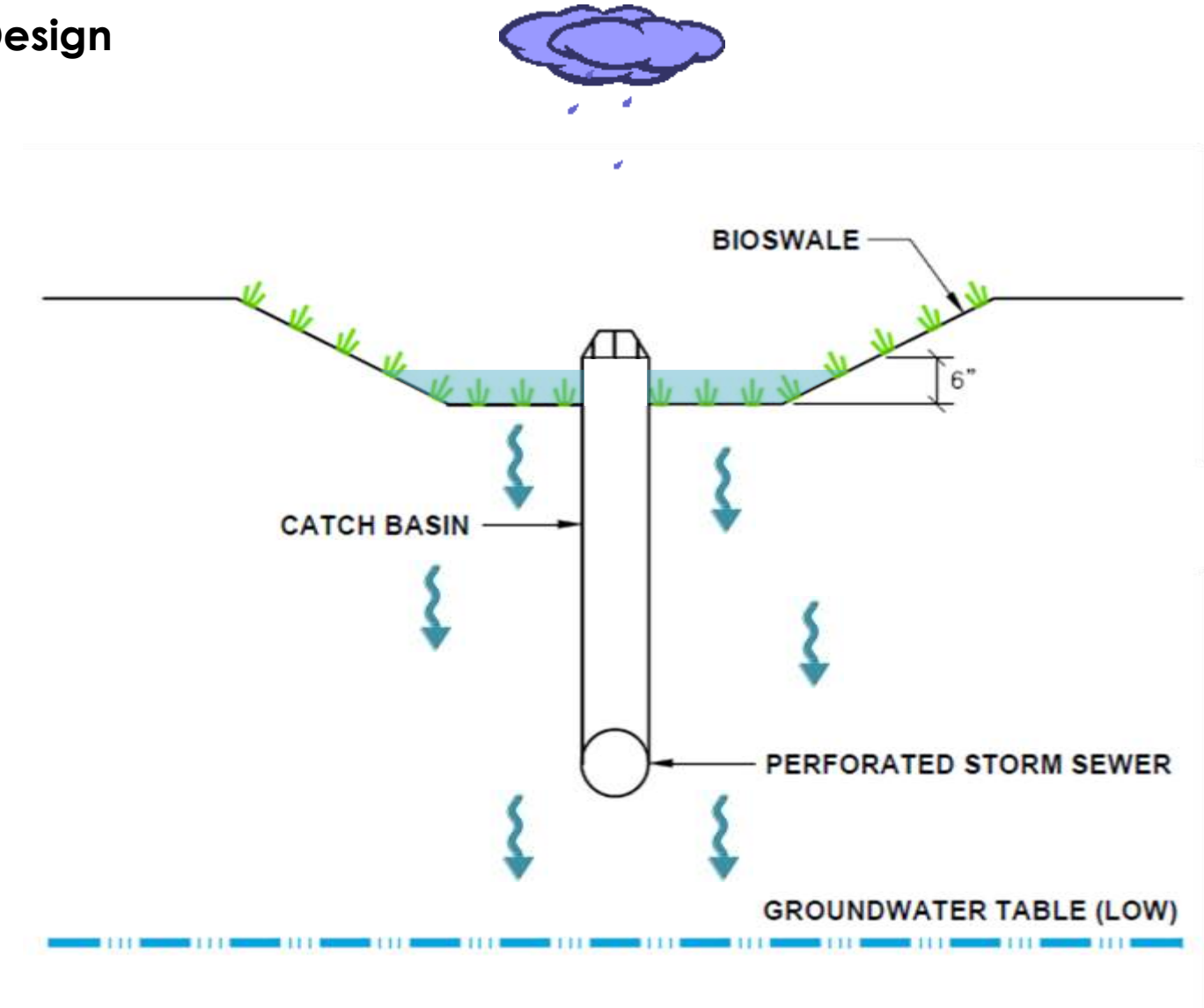
- Utilize infiltration soil capacity
- Sewer size reduction
- No need for expensive basins
  - Water quality
  - Flood control
- Half cost of traditional design

Cost Savings

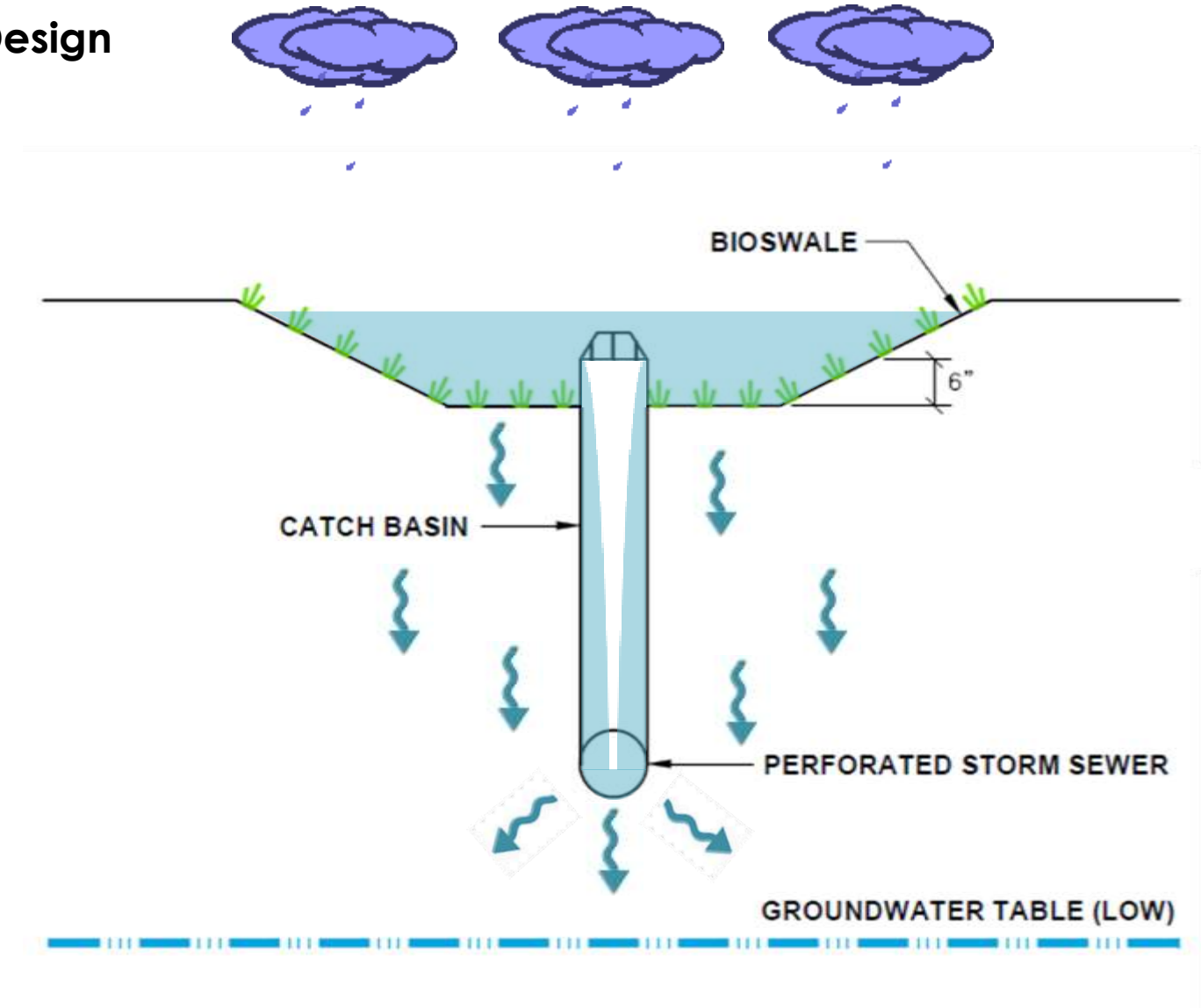
- Bioswales
- Vegetated swales
- Infiltration basins
- Perforated storm sewer/underdrain
- Sump line collection

Project Features

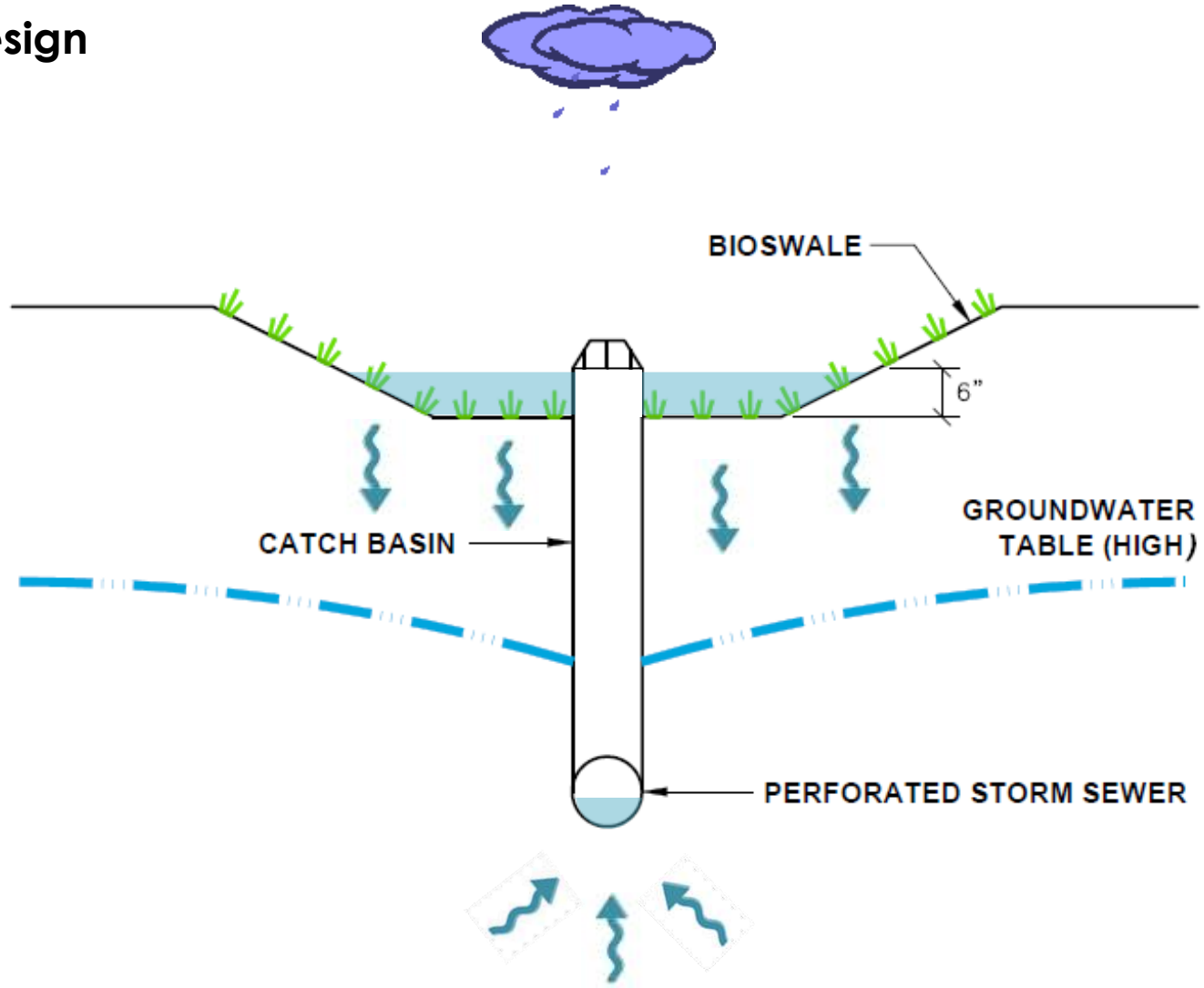
Typical Bioswale Design



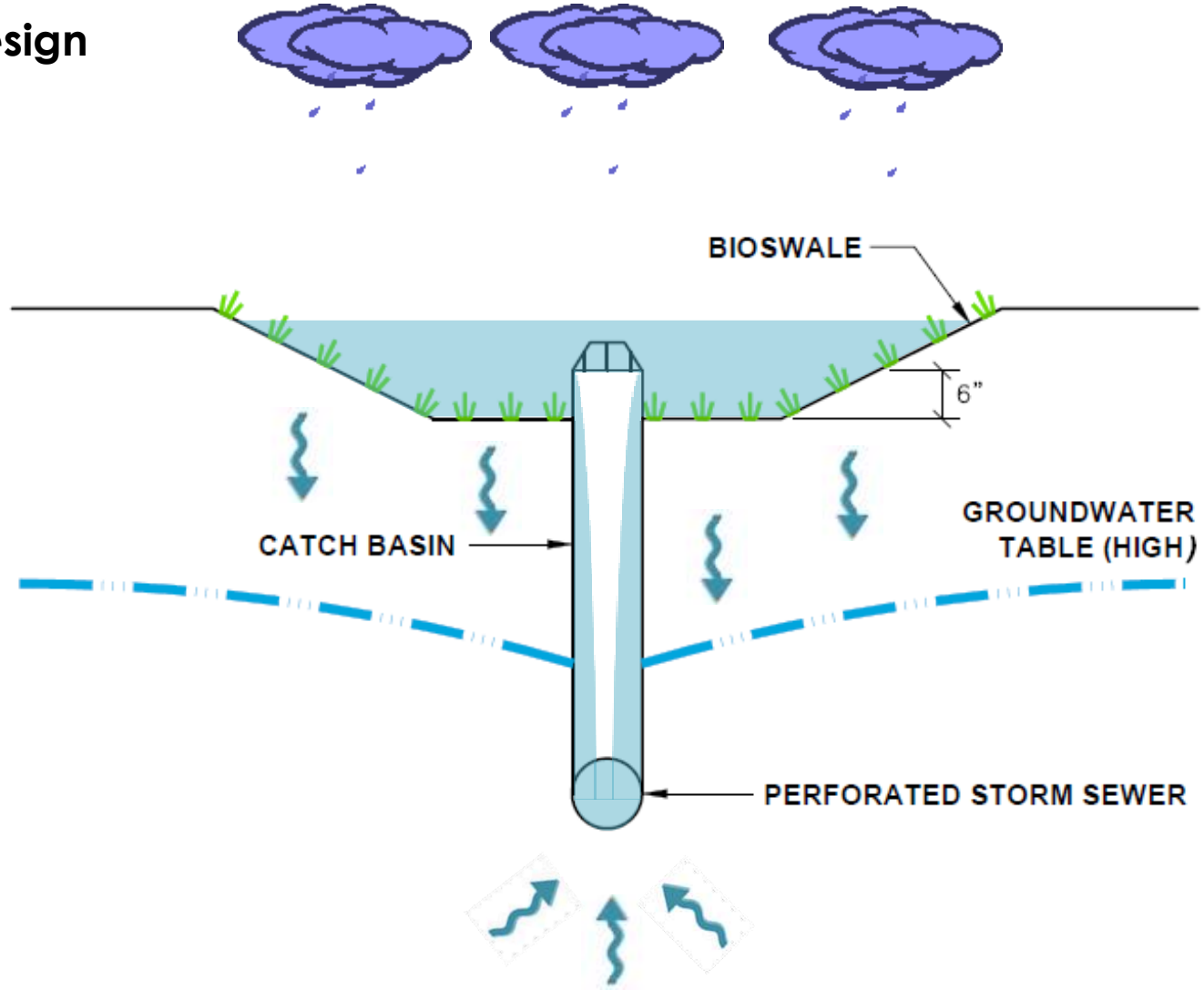
Typical Bioswale Design



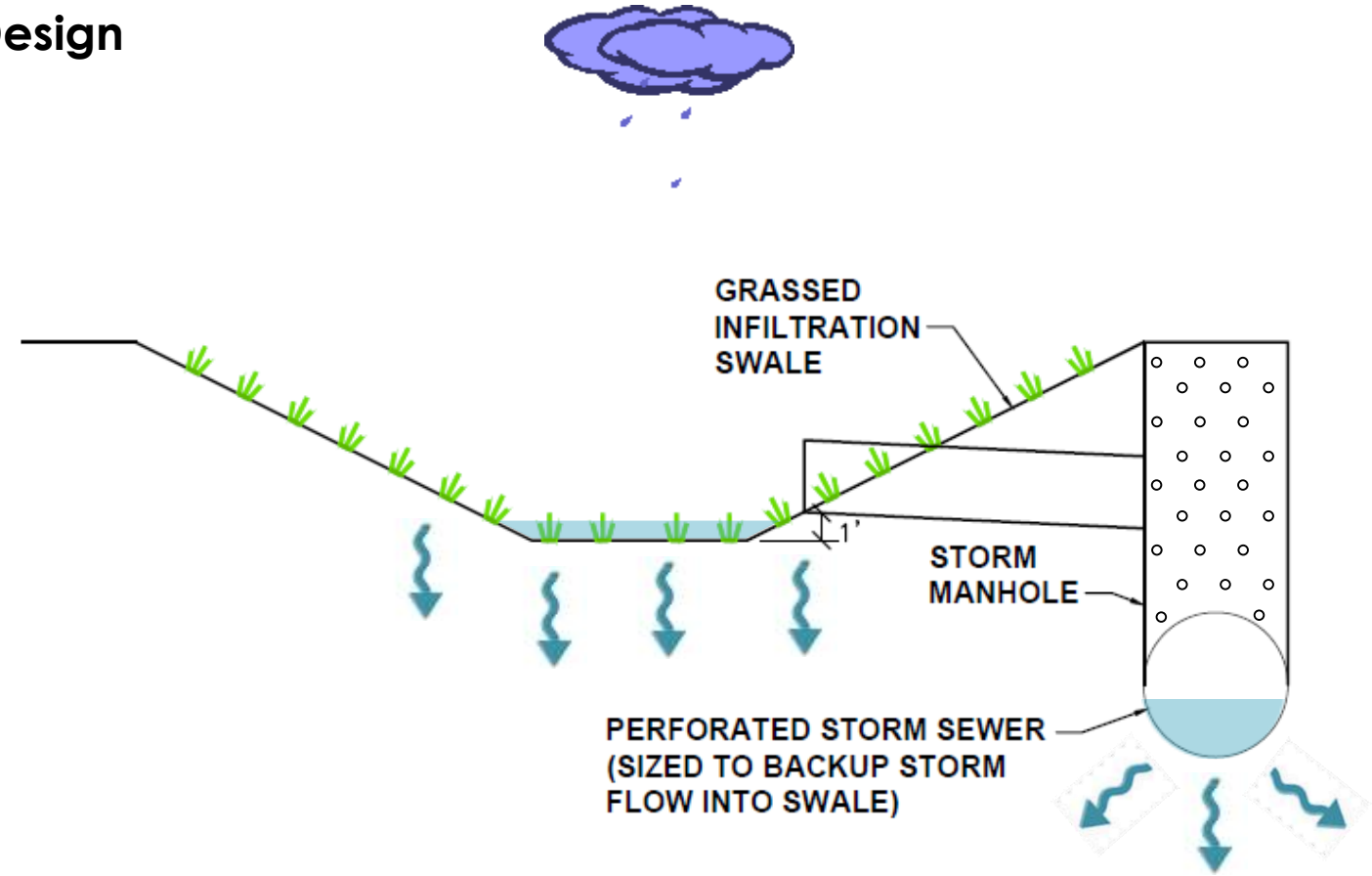
Typical Bioswale Design



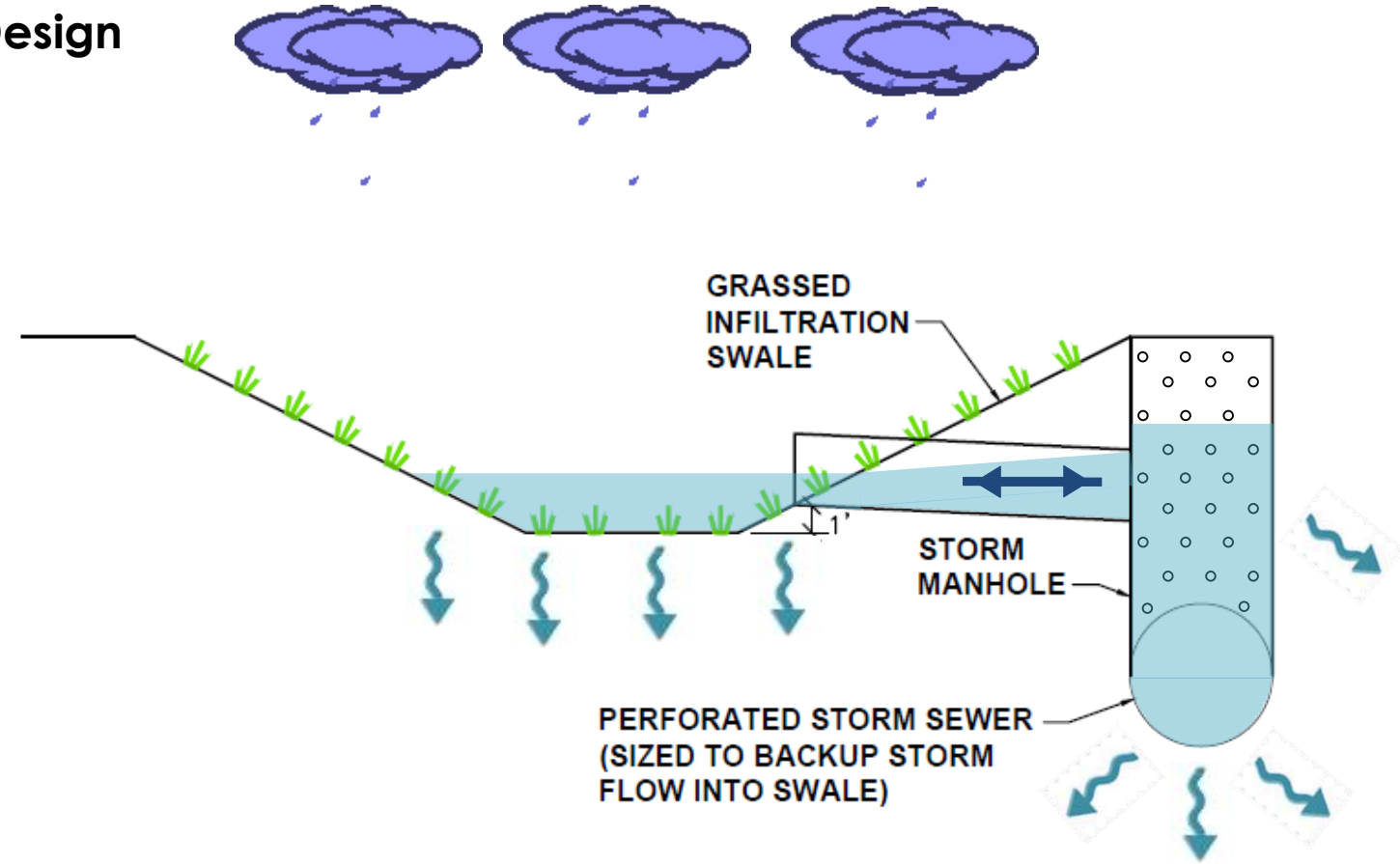
Typical Bioswale Design



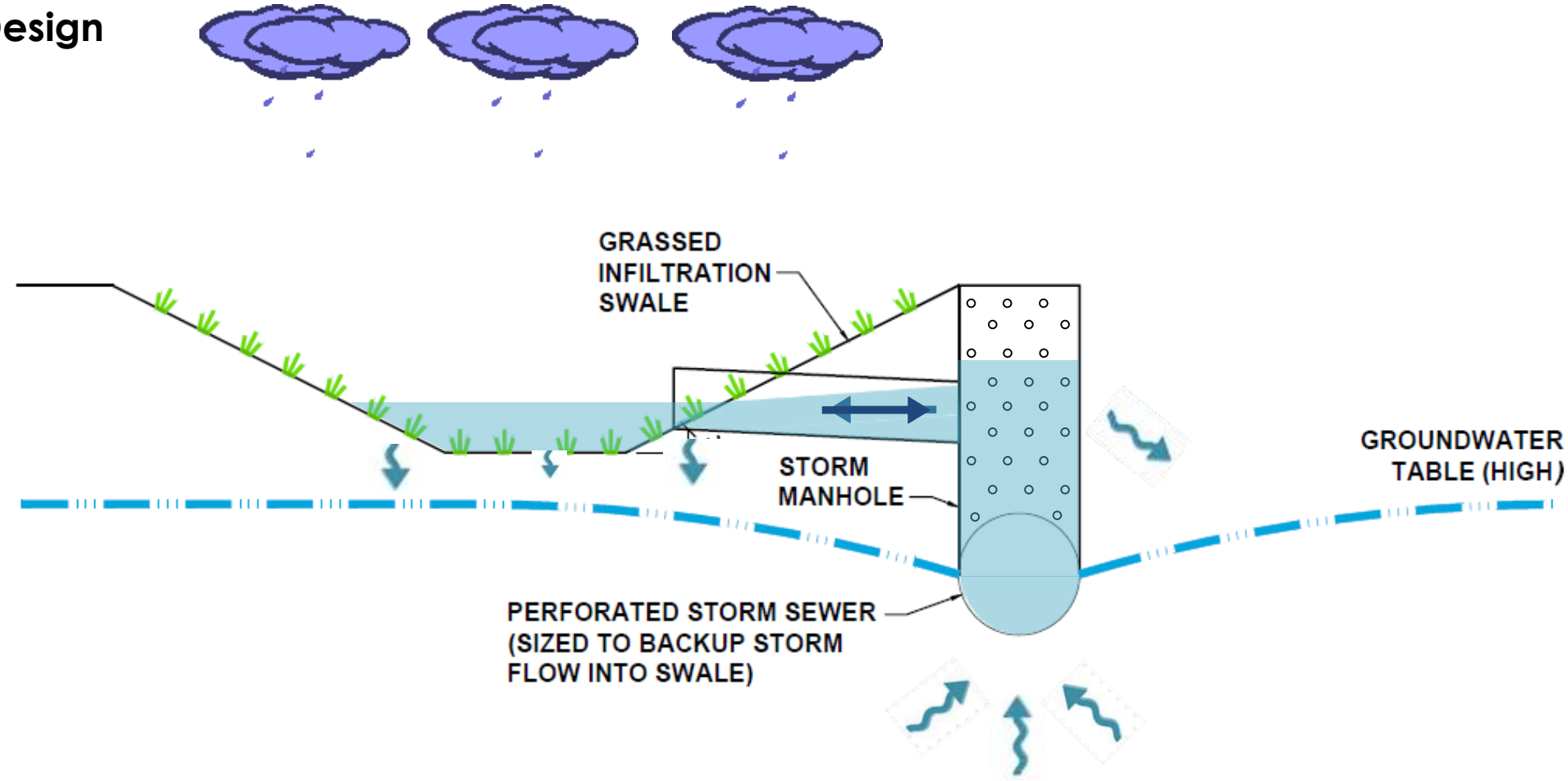
Infiltration Swale Design



Infiltration Swale Design



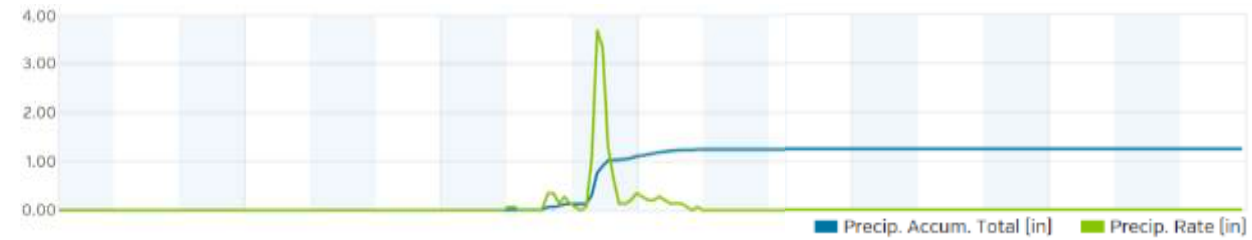
Infiltration Swale Design



- Volume reduction
- Water quality
- Cost
- Constructability
- O&M

- Lake Macatawa
  - Phosphorus TMDL
  - 173.9 acres removed from Drain No. 23
- Annual load reductions to Lake Macatawa
  - Phosphorous
  - TSS
  - Nitrogen
- Groundwater for blueberry farms
- Floodplain protection
- Wetland recharge
- Avoid landfill contaminated plume

Environmental Impacts



- 10-year, 24-hour design capacity
- 100-year, 24-hour partial capacity
- Discharge volume reduction
- Water quality

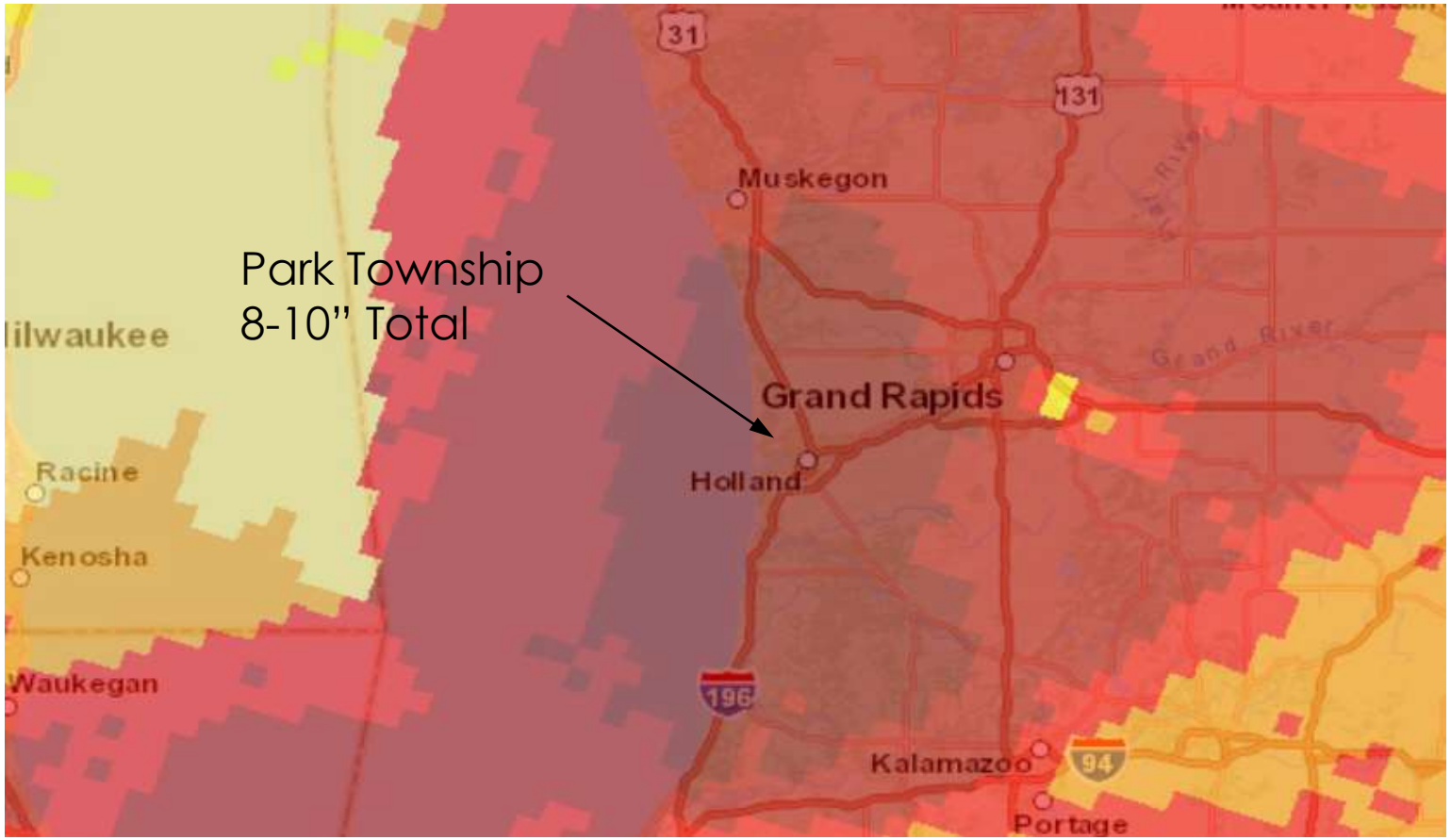
- SAW grant requirement
- Paired watershed approach (Pine Creek is a similar tributary to Lake Macatawa)
- Monitoring hydrologic differences between the two drainage systems may be the best indicator of water quality
- This data will provide both stormwater volume and peak flow per acre for at least 3 rainfall events

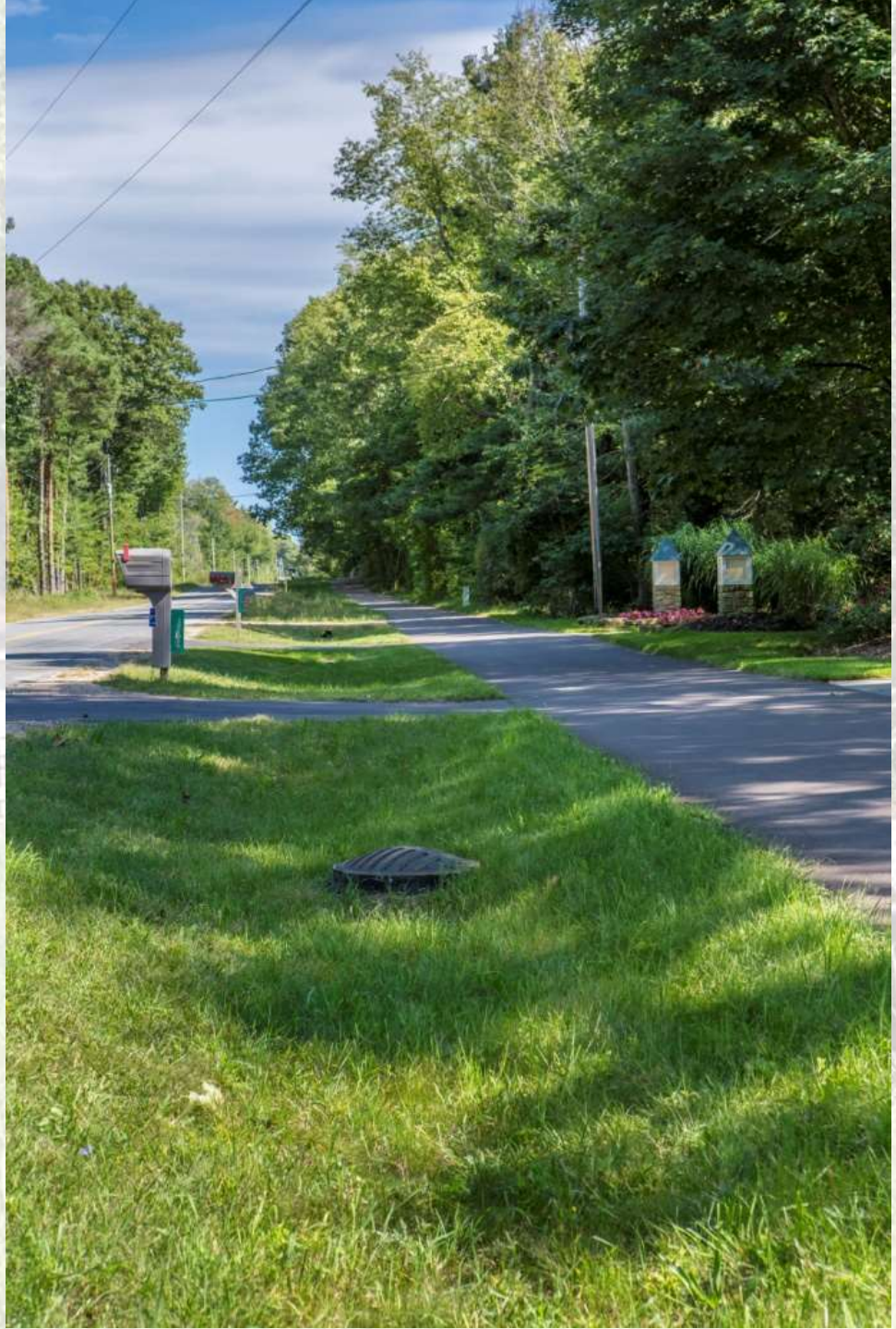
Water Quality Monitoring


Photo: Jeremy Gonsior/The Holland Sentinel


Photo: wn.com

NOAA Monthly Total, December 2008





Questions?