

CITY OF DAYTON
water
one source
Regional • Reliable • Renewable

City of Dayton
Dry Weather Screening Program



DAYTON'S WATER QUALITY HISTORY



1870- First Public Drinking Water Well Installed

1890- First Paved Road - Separate Storm & Sanitary Sewers

1913- The Great Flood
Hydromodifications

Levees and Dams



History continues...

1997 – Municipal Separate
Storm Sewer (MS4)
NPDES Permit issued

1997 – Dayton Storm Water
Ordinance adopted

2000 – Riverscape attraction
downtown



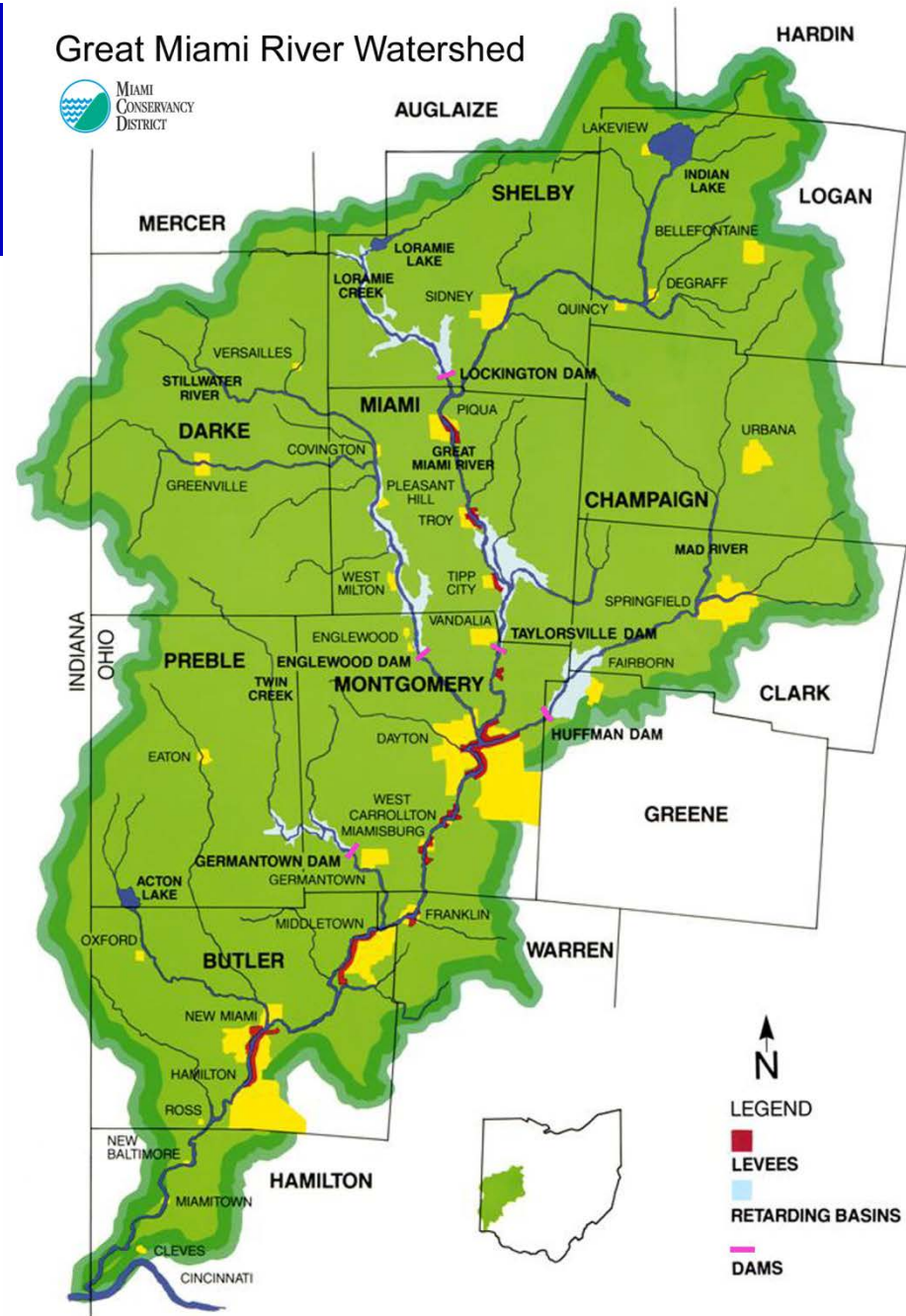
2007 – Dayton Source Water
Protection Ordinance Revised

2008 – Dayton Storm Water
Ordinance Revised

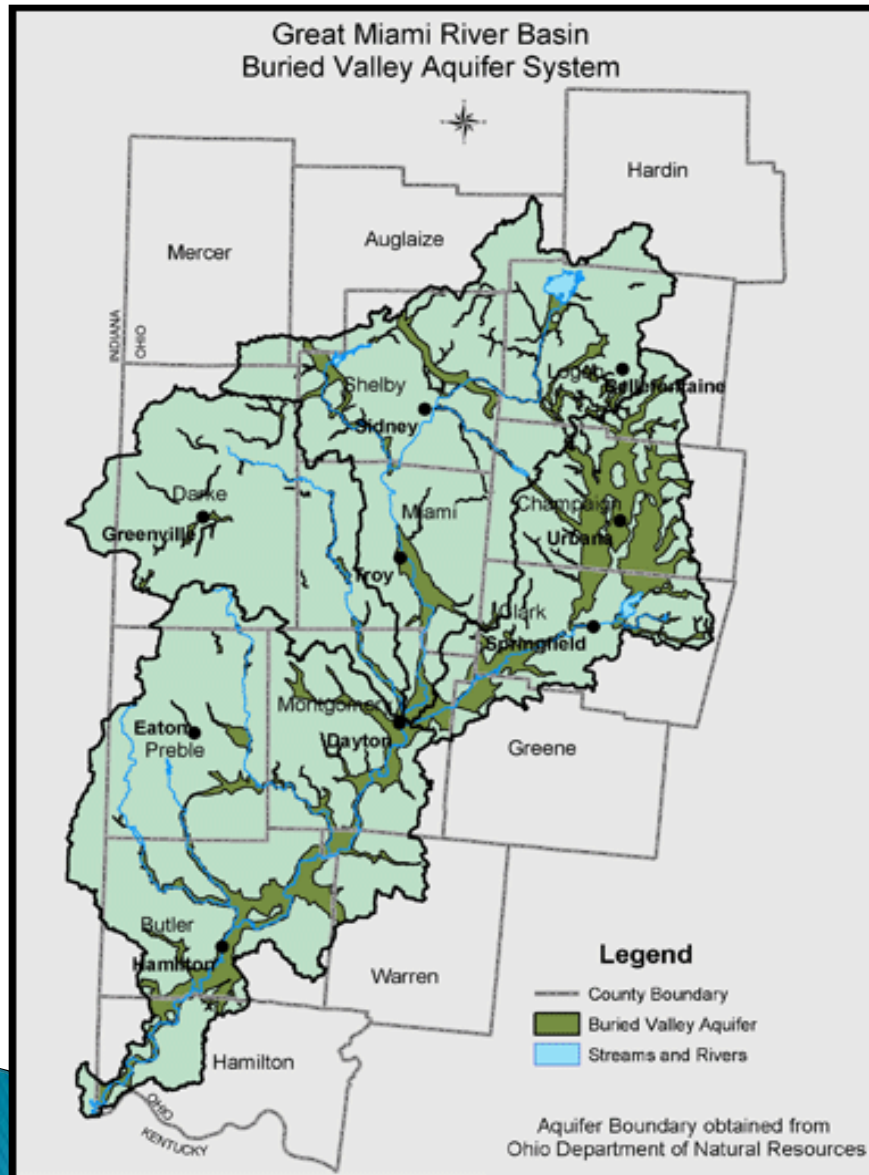
2015 – Dayton Source Water
Protection Revised

Ohio's Great Miami River Watershed

- ▶ About 4,000 square miles
- ▶ Approx. 1.5 million residents
- ▶ 15 counties
- ▶ Dayton = largest city
- ▶ Major tributaries
 - Stillwater River
 - Mad River
 - Wolf Creek
 - Twin Creek

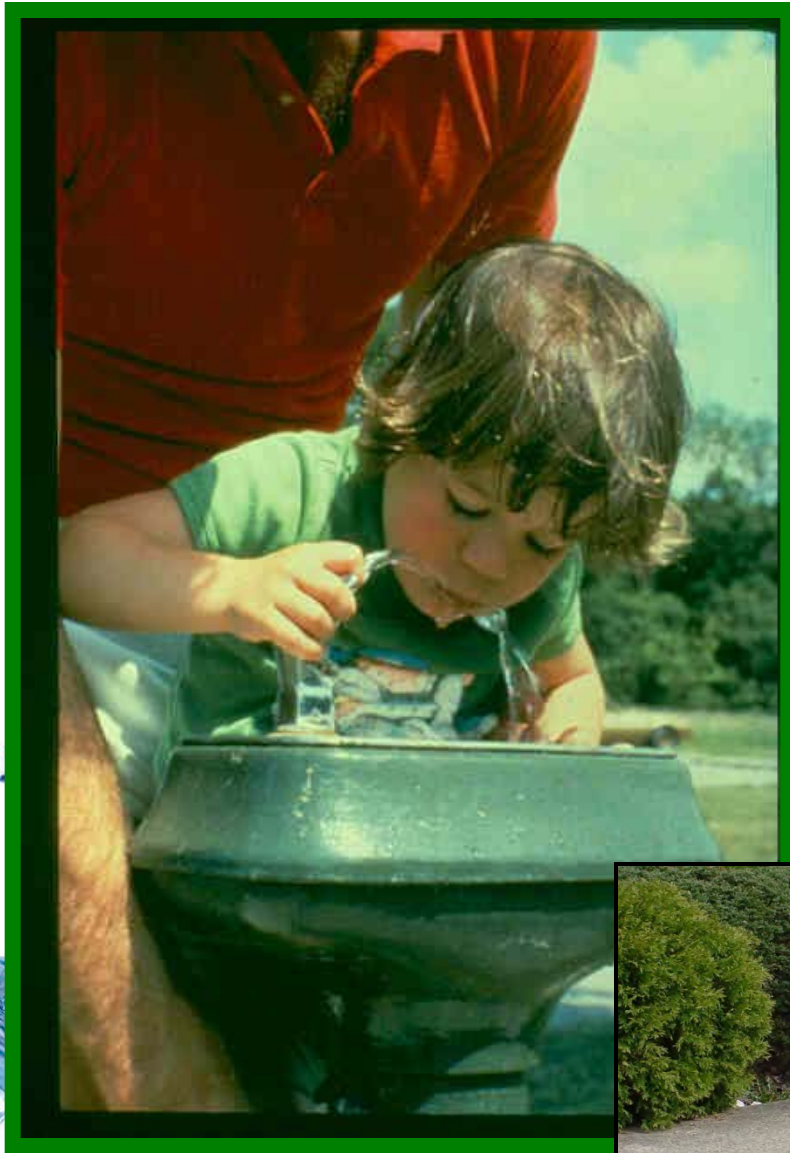


Great Miami Buried Valley Aquifer



- Sustainable Asset
- Phenomenal Recharge
- Sole Source Aquifer
- ~1.5 Trillion Gallons
- Principal Water Source For 1.6 Million People
- Yields > 2,000 GPM
- Constant 56°F – Geothermal

**Goal: Provide
quality drinking
water – meeting
Ohio EPA & SDWA
standards**

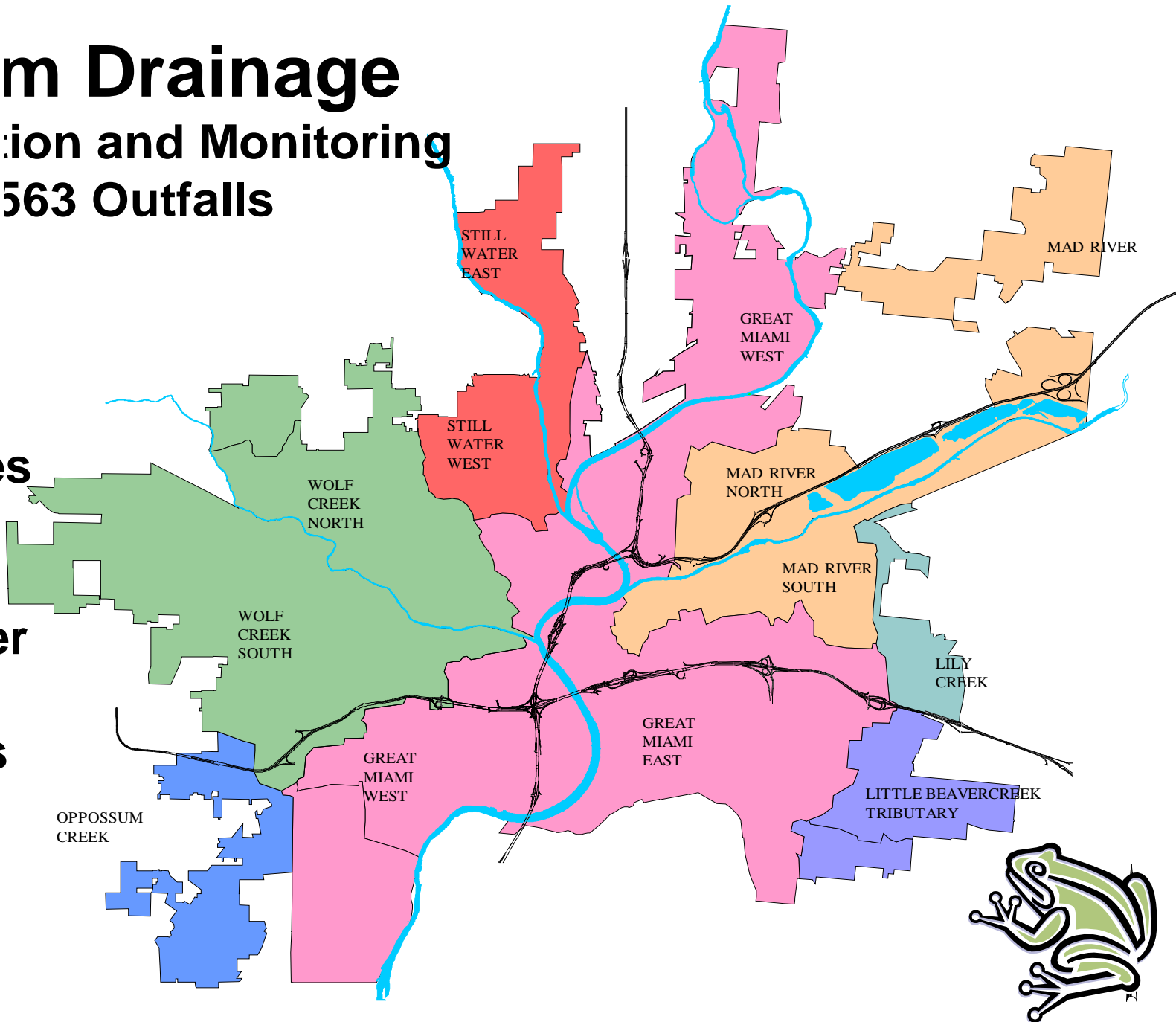


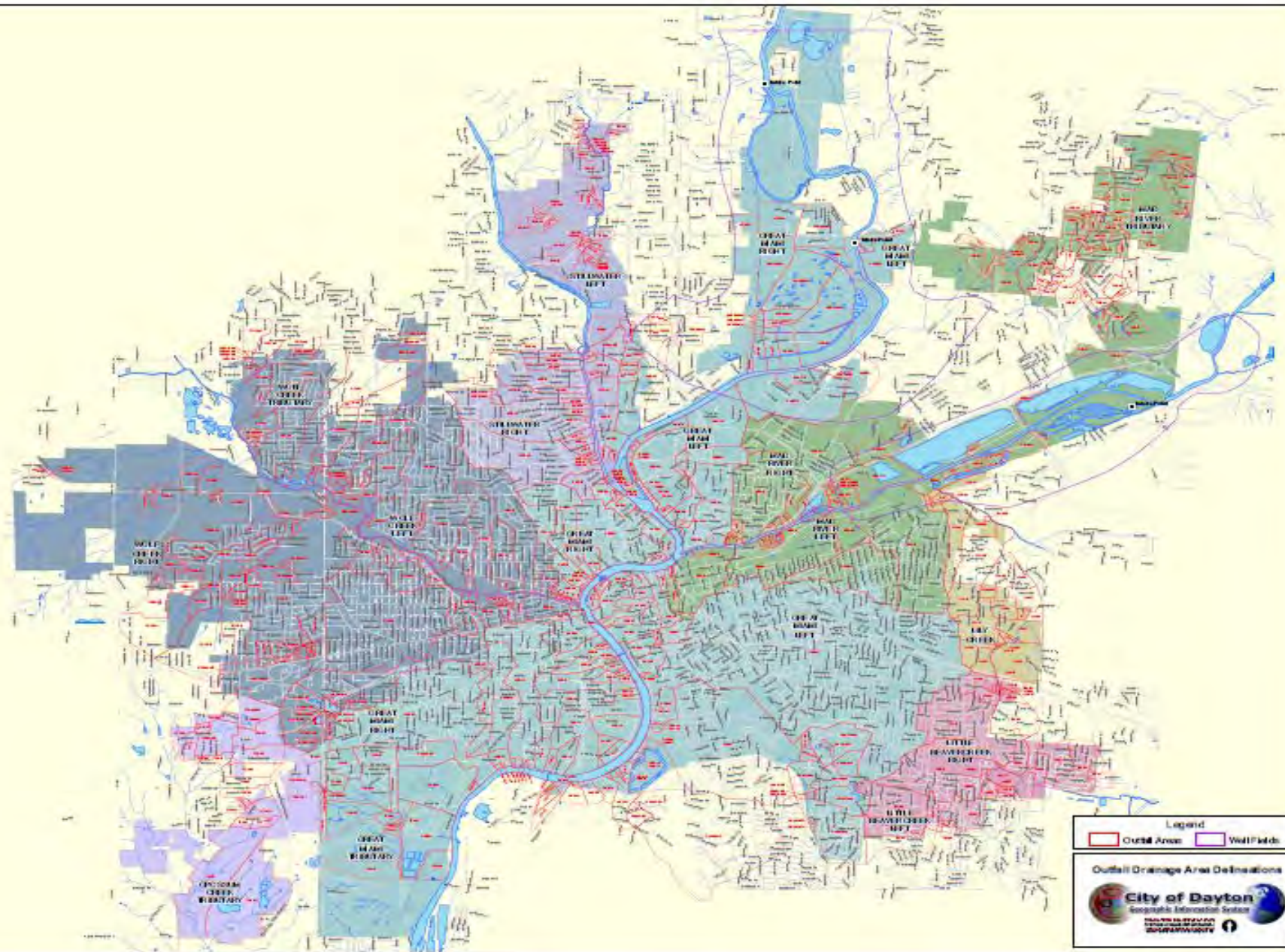
m Drainage

tion and Monitoring

563 Outfalls

**River
discharges
meet EPA
permit &
CWA water
quality
standards**





Dayton's Storm Sewer System

- **Carries billions of gallons of water each year**
- **400 miles of pipe, 20,000 catch basins, & 13 pump stations**
- **Discharges to rivers & streams at over 500 locations**
- **Great Miami River, Mad River, Stillwater River, Wolf Creek, Eastwood Lake, Little Beavercreek, Lilly Creek, Opossum Creek**



OUR TEAM

- 2 Environmental Scientists
- Environmental Compliance Coordinator
- Interns
- Water Utility Field Operations – Sewer Maintenance Bureau



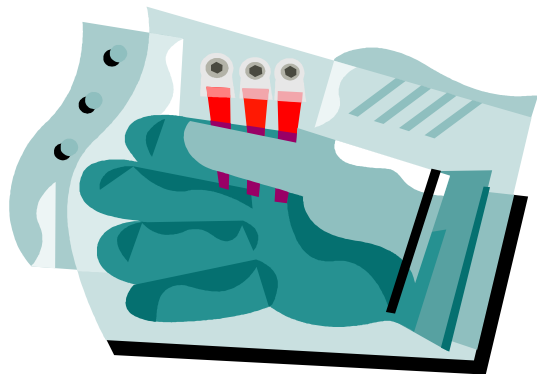
FIELD SCREENING EVALUATION FORM

Outfall	Dry Weather Screening Form 2016										Comments	Date/ Initials
Last Rain >72 Hrs	Flow Standing	Temp (°F)	pH 6.9-8.5	DO >0.5mg/L	NO ₃ -N (Nitrate) <10mg/L	Cl ₂ (Chlorine) <0.5mg/L	PO ₄ (Phosphate) <0.3mg/L	NH ₃ -N (Ammonia) <0.3mg/L				
	YES	YES										
	NO	NO	<u>Structure</u>	<u>Clarity</u>	<u>Deposits</u>	<u>Biota</u>	<u>Biological</u>	<u>Color</u>	<u>Odor</u>			
	Cracked Buried	Cloudy Solids	Oily Sediment	Fish Amphibian	Veg Damage Excess	Red Green Brown	Sulfur Sewage Oil					
	YES	YES										
	NO	NO	<u>Structure</u>	<u>Clarity</u>	<u>Deposits</u>	<u>Biota</u>	<u>Biological</u>	<u>Color</u>	<u>Odor</u>			
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	Cracked Buried	Cloudy Solids	Oily Sediment	Fish Amphibian	Veg Damage Excess	Red Green Brown	Sulfur Sewage Oil					

Visual Observations



- **Flow/No Flow**
- **Color**
- **Clarity**
 - cloudy, opaque, solids
- **Floatables**
 - sheen, trash, foam, sewage
- **Animal**
 - fish, amphibian, crustacean
- **Biological**
 - algae, mosquito, bacteria
- **Deposits**
 - oily, sediment
- **Structure**
 - cracking, corrosion



Chemical Screening

~\$6/outfall

Parameter

- Temperature
- pH
- Dissolved Oxygen
- Ammonia (NH_3)
- Chlorine (Cl_2)
- Nitrates (NO_3)
- Phosphates (PO_4)
- As needed:
- Fecal Coliform (Lab)
- VOC's

Action Level

Seasonal

<6.9 or >8.5

<0.5

>0.3 (mg/L)

>0.5 (mg/L)

>10 (mg/L)

>0.3 (mg/L)

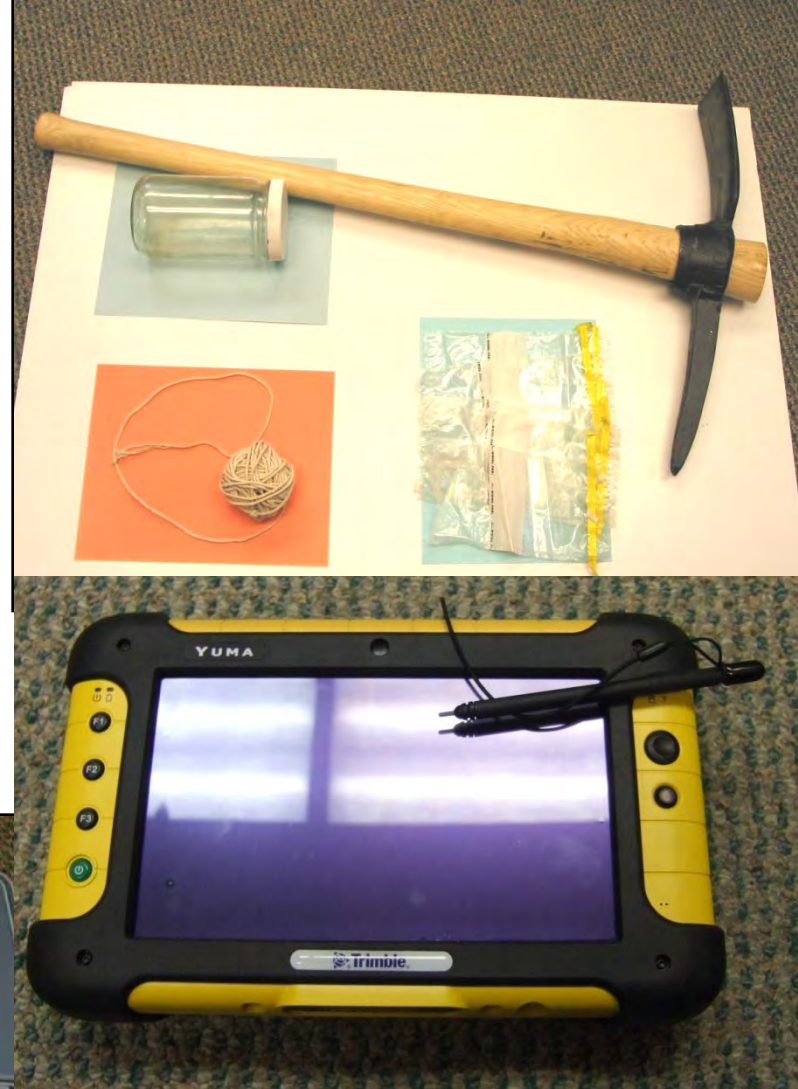
As needed:

>20,000 MPN/100 ml

• ?

Tools of the Trade

- SOPs
- Training
- Pick or “*Easy Lift*”
- String
- Sample Jar
- Sample bag
- Trimble GPS



- Hach Portable colorimeter
- Hach Sension

Dry Weather Sampling Trends 2011-2016

- **0.10 inch Rain in last 72 hours**
- **68% outfalls dry**
- **Out of range instances**
 - **Phosphate 11%**
 - **pH 17%**
 - **Ammonia 8%**
 - **Nitrates 15%**
 - **Chlorine 5%**
 - **DO 0%**



Dry Weather Sampling Trends 2011-2016

Parameter	5 Year Average	Action Level
Temperature	71.85	
NO ₃	6.46	<10
pH	6.74	6.9 - 8.5
DO	4.48	>0.5
PO ₄	0.23	<0.3
Cl ₂	0.10	<0.5
NH ₃	0.12	<0.3

Screening Parameter (out of Range)	Sources Eliminated
Algae	Septic or nutrient rich
DO	Algae – septic or nutrient rich
pH	Air Pollution Control Equipment malfunction, Fertilizer
VOCs (lab)	Air Pollution Control Equipment malfunction
Ammonia	Sanitary sewer cross connect
Black Staining/odor	Sanitary

Screening Parameter (out of Range)	Sources Eliminated
Chlorine	Sanitary sewer cross connect, Potable water leak, Irrigation System discharge to storm
Fecal	Sanitary sewer cross connect, Parts Cleaner – reroute floor drain to sanitary
TSS	Parts Cleaner – reroute floor drain to sanitary
Phosphate	Car washes dumping to storm sewer, Carpet Cleaners dumping to storm sewer
Nitrate	Fertilizer application near storm drain, Placed protective mat over storm sewer, Buffer area around storm
Iron staining	Siltation from upstream agriculture and develop, Well rehab water into storm sewer

Illicit Discharge Investigations



- 3 out of range samples
- Narrow area of investigation
- Conduct facility inspections
- Report to OEPA





Camera Truck

CITY OF DAYTON

water

one source

Regional • Reliable • Renewable

Felicia Graham

**City of Dayton, Department of Water
Division of Environmental Management**

937.333.3725