



# Stormwater Drainage and Compliance

MS4 101

- ✓ Why Does This Matter?
- ✓ What is the NPDES MS4 Permit?
- ✓ What are Impending Requirements?
- ✓ What's Next?



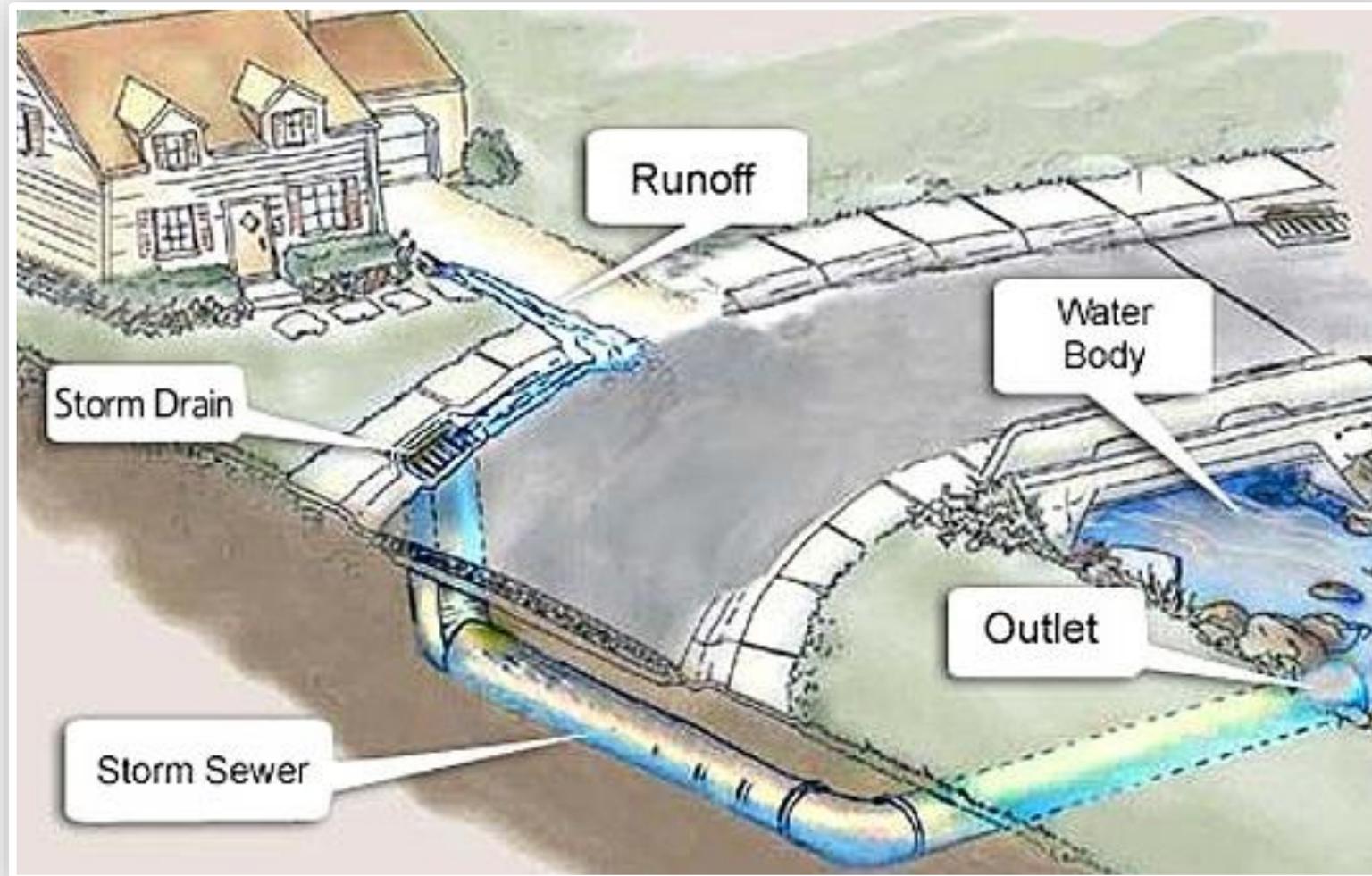
# Why Are We Here?

- MS4 General Permit in MA reissued in 2016 and effective **July 1, 2018**
- Federal Clean Water Act permit requires multi-faceted municipal implementation – Planning, Operations, Engineering, GIS-Information Technology Communications
- What are the obligations?
- What are we hoping to accomplish with these meetings?





# Municipal Drainage System 101

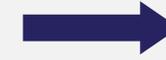




# Drainage Prevents Damage

- Stormwater is drained away to prevent expensive damage to our infrastructure

Basements



Cracking

Streets

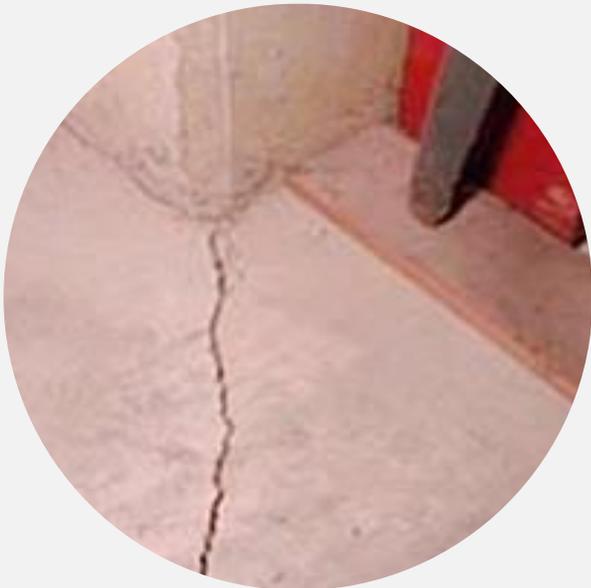


Erosion

Beneath Roadways



Road Heaving





# Unintended Consequences of Effective Drainage

- Unfortunately, drainage systems also carry pollutants like oil, fertilizers, sediment and trash.
- Rainwater that falls on paved streets, lawns, parking lots and sidewalks becomes polluted stormwater.





# Polluted Stormwater is a Problem

- Polluted stormwater runoff is one of the largest remaining sources of pollution for the Nation's waters.
- Polluted stormwater is “only increasing source of water pollution in many watersheds”.

– Seth Brown, Water Environment Federation Stormwater Program Director



Table 1. Water chemistry data summer 1996

Parameters (unit)	Upstream (256)	Downstream (257)	Water Quality Criteria	
Total Phosphorus (mg/L)	0.012	0.140	0.031 <sup>1</sup>	
Total Suspended Solids (mg/L)	5.5	2.5	NC	
<b>Heavy metals</b>				
			CMC <sup>2</sup>	CCC <sup>3</sup>
Cadmium (µg/L)	ND 0.5	ND 0.5	0.64	0.32
Copper (µg/L)	2.8	3.4	3.89	2.99
Iron (µg/L)	280	610	NC	1,000
Lead (µg/L)	<2	<2	10.52	0.41
Zinc (µg/L)	ND 4	ND 4	29.9	27.1
Manganese (µg/L)	13	75	NC	NC
Nickel (µg/L)	<1	1.3	363.4	40.4



Table 3. Results from waters chemistry sampling on Copsic Brook

Parameters	Station #1 Sample date Unit	Upstream (256)			Downstream (257)			Water Quality Criteria	
		15-Jul	11-Aug	25-Aug	9-Sep	15-Jul	11-Aug		25-Aug
<b>Nutrients</b>									
Total Kjeldahl Nitrogen	mg/L		0.1		0.5	0.5	0.4	0.4	NC
Nitrate-Nitrite-N	mg/L		0.22		0.72	0.73	0.78	0.88	NC
Ammonia	mg/L		0.03				0.05		NC
Total Nitrogen	mg/L		0.21		1.22	0.93	1.23	1.39	0.71 <sup>1</sup>
Ortho-phosphate	mg/L		0.004		0.015	0.019		0.016	NC
Total Phosphorus	mg/L		0.015	0.015	0.077	0.063	0.046	0.056	0.011 <sup>1</sup>
Dissolved Organic Carbon	mg/L		1.3	1.9		6.2	4.6		NC
Total Organic Carbon	mg/L		1.3	1.9		6.6	4.6		NC
Chlorophyll a	mg/L		-0.0005		-0.0042	-0.0032		-0.0028	0.00375 <sup>2</sup>
Total Suspended Solids	mg/L		6	5	2	5	2	4	NC
Bacteria (E. coli)	# col./100 ml		25	411	44	866	485	368	989 <sup>1,3</sup> 142 <sup>1,3</sup>
<b>Metals</b>									
	µg/L								CMC <sup>4</sup> CCC <sup>4</sup>
Cadmium	µg/L		ND 0.5		ND 0.5	ND 0.5		ND 0.5	0.64 0.32
Copper	µg/L		ND 5		ND 5	ND 5		ND 5	3.89 2.99
Iron	µg/L		210		1,000	860		760	NC 1,000
Lead	µg/L		ND 2		3	ND 3		ND 3	10.52 0.41
Zinc	µg/L		5		5	29		ND 5	29.9 27.1
Chromium	µg/L		3		3	3		16	11
Nickel	µg/L		ND 4		ND 4	157		ND 4	363.4 40.4
Chloride	mg/L		20					860	250



# Stormwater Permitting Programs

- Construction General Permit (CGP):  
Runoff from >1 acre soil disturbance
- Industrial Multi-Sector General Permit (MSGP):  
Runoff from Industrial Facility per SIC Code
- **Municipal MS4 General Permit**

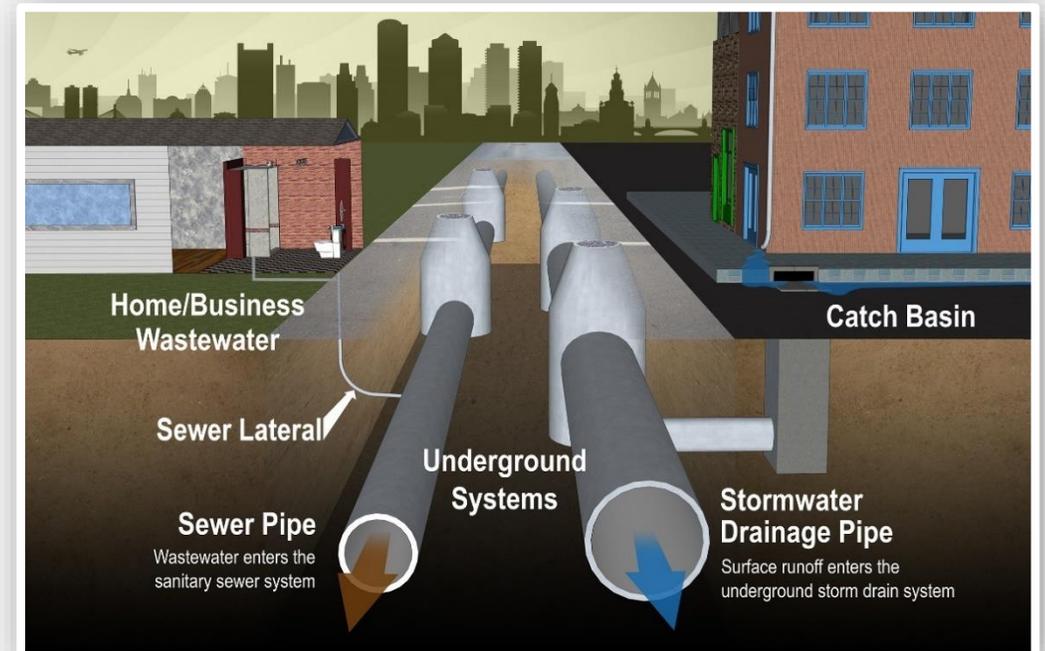




# What is an MS4?

A **Municipal Separate Storm Sewer System** is:

- A conveyance or system of conveyances owned by a state, city, town, or other public entity that discharges to waters of the U.S and is:
  - Designed or used for collecting or conveying stormwater
  - Not a combined sewer
  - Not part of a publicly-owned treatment works





# What is an MS4?

**A Municipal Separate Storm Sewer System includes more than Cities and Towns...**

- This regulatory program also includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares.

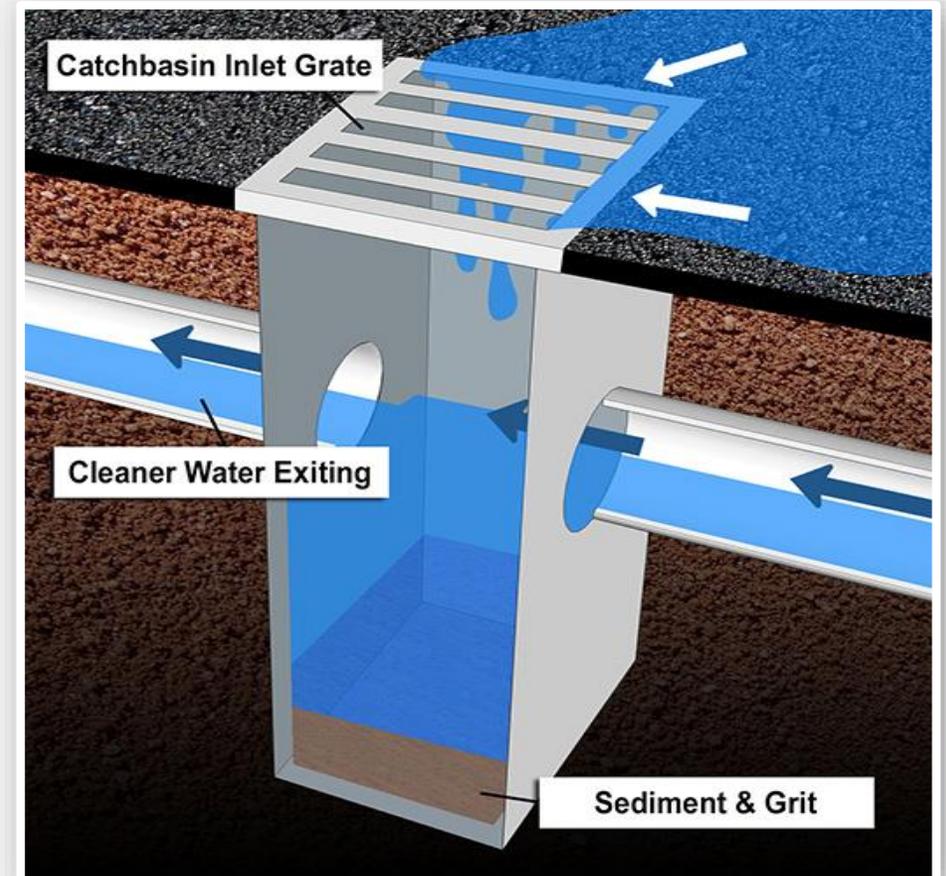




# Westfield's MS4

## Drainage System Facts:

- ~148 Miles of Stormwater Drainage Pipe
- ~8000 Catchbasins (public and private)
- ~2500 Manholes
- ~300 Stormwater Discharge Points
- Ditches and Swales as well...

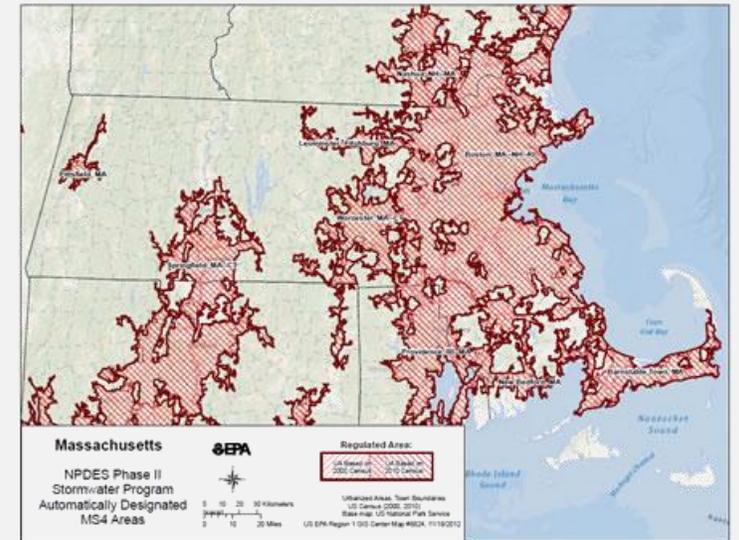




# What is the MS4 General Permit?

Clean Water Act requires EPA to regulate any discharges from the MS4

- 1987 Clean Water Act Amendments
- The MS4 general permit is based on development density and population and most municipalities in eastern MA are regulated
- In most states, the state administers this permit – MA is EPA regulated
- Every five years a new permit is drafted and issued (in theory)
- Each permittee (city) is required to develop and submit a 5-Year Stormwater Plan consistent with the general permit





# Consequences for Failure to Comply with MS4 Permit



## Enforcement Action

- Notice of Violation, fines, or other penalties
- Consent Order
- Prosecution

## Permit Termination or Revocation

- Permit Modification
- Stricter Permit Limits
- Denial of Permit Renewal

**Jeopardized Public Health, Safety and Environment**





# Municipal Stormwater Compliance

## Six Primary Control Measures

1. Public Education
2. Public Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Runoff Control
5. Post-Construction Stormwater Management
6. Good Housekeeping and Pollution Prevention





# Public Education



Implement public education programs to help the community understand its role in keeping water clean.



# Public Education

- **Starting 1st year**, distribute minimum of 2 messages regarding MS4 program to each audience (including employees, students, visitors, contractors) over the permit term, for a total of at least 8 messages per term
- Continue to document, evaluate, and improve public education process
- Targeted outreach may be required in impaired watersheds





# Public Involvement



Engage the public in decision-making throughout the program.



# Public Involvement

- Make all reports available to the public
- Allow for public review of the 5-Year Stormwater Management Plan
- Other – Integrate the public in MS4 activities where possible





# Illicit Discharge Detection and Elimination



Find and fix failing septic systems or sewers that might be connected to the drainage system.



# What are Illicit Discharges?

“any discharge to a MS4 that is not composed entirely of stormwater”

## Indirect Discharge

May come from a variety of sources

- Failed septic system
- Hazardous waste spills
- Leaky sewer line
- Grass clippings, leaf litter, pet waste or other solid material dumped into MS4



## Direct Connection

A non-stormwater pipe connected to the Drainage System

- Washing machine
- Sewer Lateral





# Construction Site Runoff Control

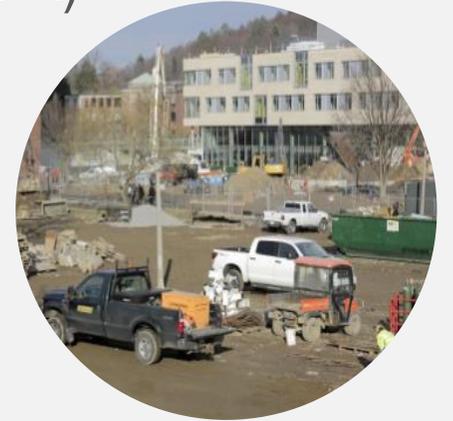


Ensure that construction projects do not pollute runoff with sediments and debris.



# Construction Runoff Control

- All sites >1 acre “disturbed” (or common scheme of development) must be compliant with the Construction General Permit
- Erosion and Sediment Control (ESC) plan must be developed and consistent with CGP
- Erosion and Sediment Control plan review process must be functional and documented
- Trained staff for reviewing ESC plans
- Site inspections and enforcement
  - Tracking, Inspections and Documentation
  - Ensure contractors stay consistent with ESC plan
  - Enforcement





# Post-Construction Stormwater Management



Ensure that new development and redevelopment control and treat runoff before it leaves private property.



# Post-Construction Runoff Control

- “Address” stormwater runoff on >1 acre projects
  - Peak runoff control, infiltration and stormwater treatment
- Stormwater Control System design plan review process
  - Trained staff for reviewing engineering design and O&M Plan
  - Documentation of review process
- Site inspections to ensure construction is “To Plan”
- Post-construction inspection and maintenance
  - Trained staff for inspections and maintenance
  - Tracking public and private facilities





# Good Housekeeping and Pollution Prevention



Engage in municipal best practices such as cleaning drainage systems, sweeping streets, and ensuring municipal activities like vehicle washing and lawn maintenance do not contribute to pollution.



# Good Housekeeping

- Roadway Pollution Prevention Program
  - Pavement sweeping and catch basin cleaning
- Stormwater Pollution Prevention Plans (SWPPP)
  - Transfer stations, maintenance yards, and fueling areas
- Standard Operating Procedures for **ALL** Municipal Facilities – Landscaping, Buildings, Equipment Maintenance and Roads
- Consistent Employee Training and Awareness
- Compliance Tracking & Annual Reporting





# What are “New” Items in EPA’s MS4 General Permit

- Mapping of the full SW system not just outfalls
- Intensive IDDE program required
  - Dry and wet weather monitoring of outfalls
  - All stormwater drainage areas investigated over 10 years
- Refinement of Construction and Post-Construction ordinances and inspection process
- Extra efforts association with “Impaired Waters”!
- Detailed compliance tracking and annual reporting



# Obtaining MS4 GP Coverage – Timeline

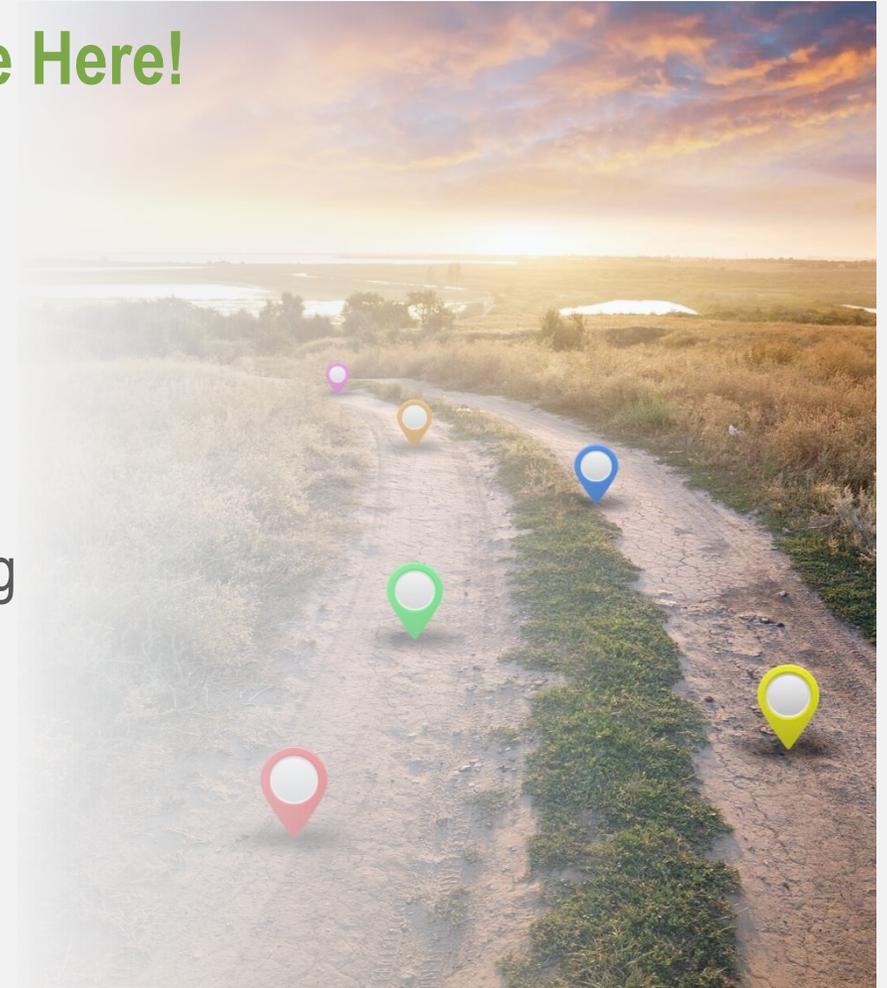
- Evaluate the special eligibility requirements
  - Endangered species
  - Historic structures
- Submit Notice of Intent (NOI) 90 days after “effective date of permit” – **September 29, 2018**
  - “Soft” program plan required to be submitted within NOI
  - Outfall mapping clarification of ownership and discharge location / receiving waters
- Develop and implement a Stormwater Management Program plan





# What's Next?

- Workshop with City Leadership – **You Are Here!**
- Development of 5-Year Program Plan – Responsible Parties
  - Consider existing Master Plans, partners, programs, software and infrastructure CIP to leverage for compliance
  - Utilize staff trainings and Standard Operating Procedures to build internal capacity





# Questions / Discussion

