MS4 Technical Assistance

March 26, 2025

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Agenda

- ✓ MS4 Infrastructure Mapping Requirements
- ✓ ArcGIS Online Mapping Tool
- ✓ Watershed Inventory Report Requirements
- ✓ Resources
- ✓ Q & A

2

MS4 Infrastructure Mapping Requirements

3

Overview of Required Attributes

MS4 Outfalls	MS4 Ground Water Discharge Points	MS4 Interconnections	Storm Drain Inlets	MS4 Manholes
✓ Type ✓ Receiving surface water name	✓ Type	✓ Type ✓ Into/from entity	✓ Type ✓ Catch basin present ✓ Label present ✓ Retrofitted	✓ **None**
MS4 Conveyance	**MS4 Pump Stations**	**Stormwater Facilities**	**Property Boundaries of Maintenance Yards and Ancillary Operations**	**Property Boundaries of Public Complex**
✓ Type ✓ Direction of flow	✓ **None**	✓ Type	✓ Type	✓ **None**

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Acceptable Data Formats for Submission

Shapefiles

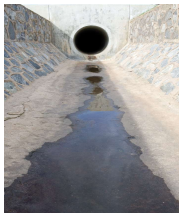
Geodatabases

AutoCAD Files

5

MS4 Outfalls

"Outfall" means any point source which discharges directly to waters of the United States



Required Attributes:
- ✓ Type
- ✓ Receiving surface water name

*Submit as a point layer

Local ID	Type	Receiving Surface Water Body
01	Pipe	Delaware River
02	Open Channel	Storm Creek
03	Other – Described in comments	Lake Hopatcong

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MS4 Ground Water Discharge Points

"Ground water discharge point" means the lowest invert elevation of any stormwater facility where stormwater discharges into the surficial ground water aquifer.

Required Attributes:
- ✓ Type

**Submit as a point layer*

Local ID	Type
01	Constructed Infiltration BMP
02	Overland Flow Area
03	Other – Described in comments

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Basins with Multiple Inlet Structures

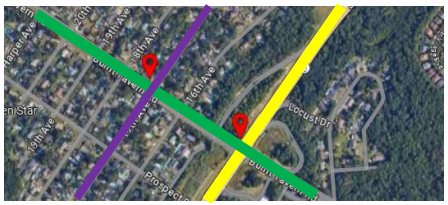
8

MS4 Interconnections

"MS4 interconnection" means any point at which an MS4 flows into or from another MS4.

Required Attributes:
- ✓ Type
- ✓ Upstream Entity
- ✓ Downstream Entity

**Submit as a point layer*



Local ID	Type	Upstream Entity	Downstream Entity
01	Pipe	Mercer County	Hamilton Township
02	Open Channel	Hamilton Township	NJDOT
03	Other – Described in comments	TCNJ	Mercer County

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Storm Drain Inlets

Required Attributes:
- ✓ Type
- ✓ Catch Basin Present?
- ✓ Label Present?
- ✓ Retrofitted?

**Submit as a point layer*

"Storm drain inlet" means the point of entry into the MS4.

Local ID	Type	Catch Basin Present?	Label Present?	Retrofitted?
01	Type A - Single Grate Inlet	Yes	Yes	Yes
02	Type B or C - Combination Inlet	Yes	Yes	No
03	Type D - Barrier Curb Combination Inlet	Yes	No	Yes
04	Type E - Dual Grate Inlet	No	Yes	Yes
05	Curb Cut	Yes	Yes	No
06	Trench Drain	No	No	No
07	Other	No	No	No

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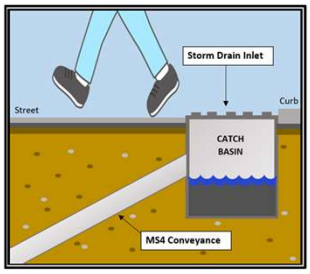
"Catch Basin" means a cistern, vault, chamber, or well that is typically built along a street and below an inlet grate as part of the storm sewer system that is designed to capture and retain sediment, debris, and pollutants so those particles do not pass on to the stormwater sewer system.



Catch Basin Present?

11

Label Present?

12

Retrofitted?

"Retrofit" means to make the curb opening of a storm drain inlet smaller to control the passage of solid and floatable materials through it.

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MS4 Manholes

"MS4 manhole" means a round structure that provides access to an underground MS4 system.

Required Attributes:
✓ None

**Submit as a point layer*

Optional attribute table

Local ID	Road Name	Diameter	Material
01	Main Street	18 in	Corrugated Metal
02	Ocean Avenue	24 in	Concrete
03	Storm Drive	20 in	Steel

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MS4 Conveyance

"MS4 conveyance" means a drainage system which can include municipal streets, curbs, gutters, ditches, manmade channels, or storm drains that convey stormwater.

Required Attributes:
✓ Type
✓ Direction of flow

**Submit as a line layer*

Local ID	Type	Direction of Flow
01	Pipe	N
02	Open Channel	SE
03	Other – Described in comments	NW

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MS4 Pump Stations

"MS4 Pump station" means an intermediate collection tank for stormwater with a submersible pump at the bottom.

Required Attributes:
✓ None

**Submit as a point layer*

Optional attribute table

Local ID	Number of Pumps	Flow Capacity	Road Name
01	2	10,000 gallons	Main Street
02	1	5,000 gallons	Ocean Avenue

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Stormwater Facilities

"Stormwater facility" means stormwater infrastructure including, but not limited to, infiltration basins, detention basins, green infrastructure (GI), filter strips, riparian buffers, infiltration trenches, sand filters, constructed wetlands, wet basins, bioretention systems, low flow bypasses, and Manufactured Treatment Devices (MTDs).

Required Attributes:
✓ Type

**Submit as a point layer*

Local ID	Type
01	Bioretention System
02	Blue Roof
03	Rain Garden
04	Constructed Wetland
05	Dry Well
06	Extended Detention Basin
07	Green Roof
08	Infiltration Basin
09	MTD
010	Pervious Pavement
011	Sand Filter
012	Wet Pond

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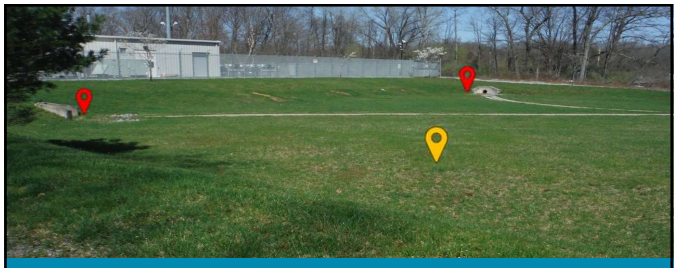

What if it's both?

Stormwater Facility & Ground Water Discharge Point

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Property Boundaries of Maintenance Yard & Ancillary Operations

Maintenance or storage yard(s) owned/operated by the permittee.
Can include fleet or maintenance shops with outdoor storage areas, impound yards, permanent and mobile fueling locations, salt/sand storage locations, snow disposal areas, etc.

Required Attributes:
✓ Type

**Submit as a polygon layer*

Local ID	Type
01	DPW Yard
02	Salt storage yard
03	Fueling pumps

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Property Boundaries of Public Complex Facility

Required Attributes:
✓ None

**Submit as a polygon layer*

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ArcGIS Online Mapping Tool

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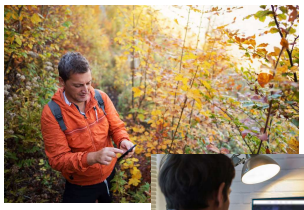
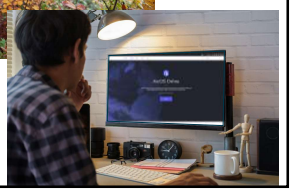
Mapping & Inventory Options

- ✓ ArcGIS Online
  - ✓ Desktop
  - ✓ GPS Device
  - ✓ Phone or Tablet
- ✓ ESRI Geodatabase
  - ✓ ArcMap
  - ✓ ArcPro





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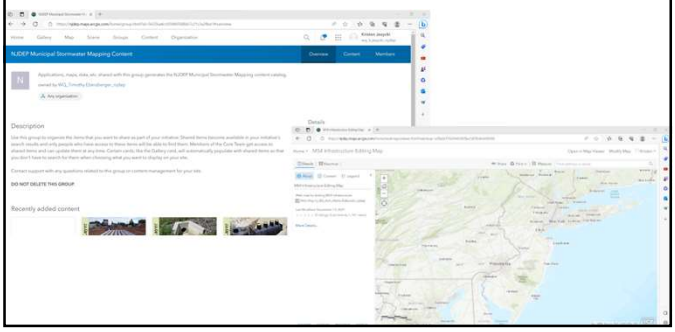
ArcGIS Online – Shared Editing Map



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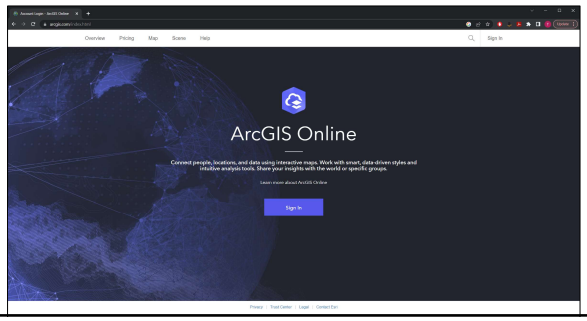
ArcGIS Online Data Collection



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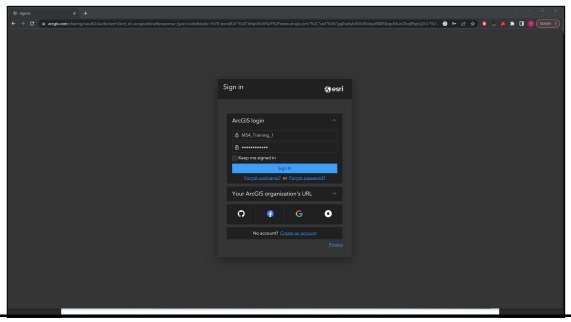

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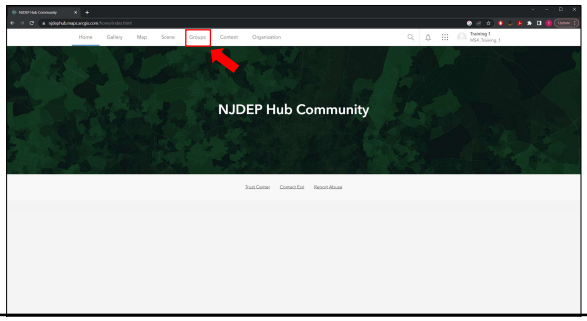

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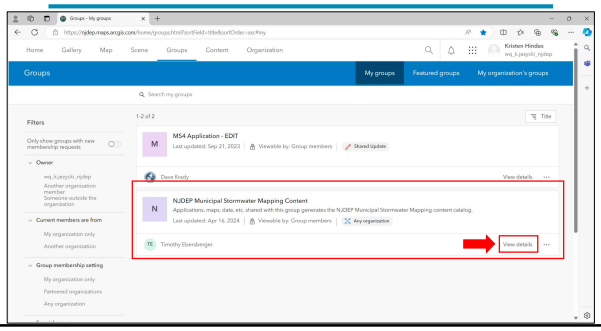

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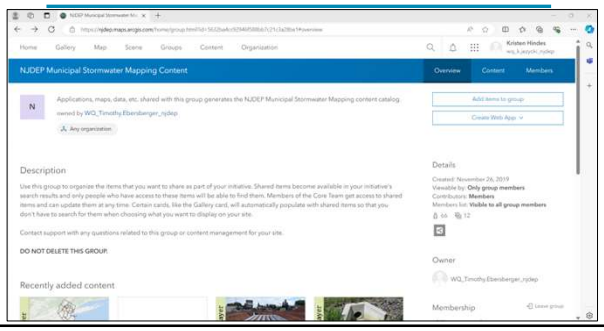

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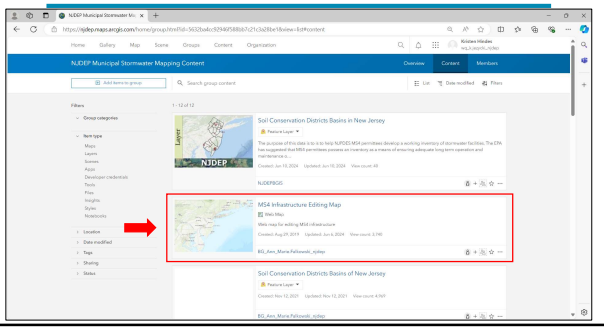

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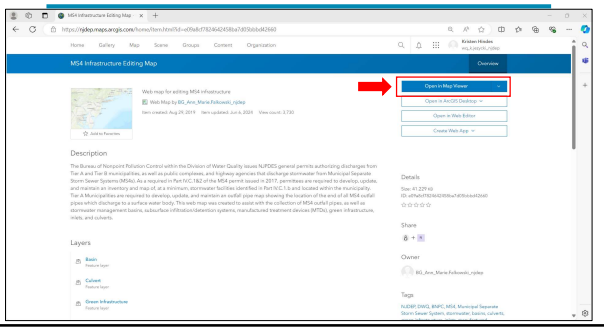

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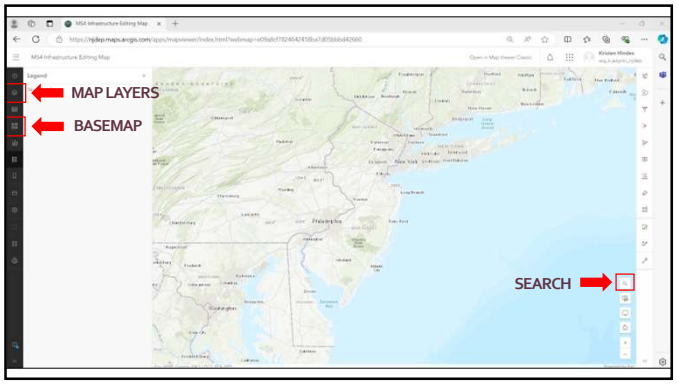

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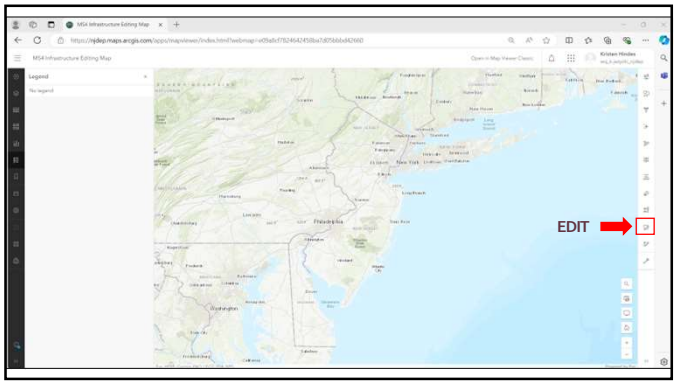

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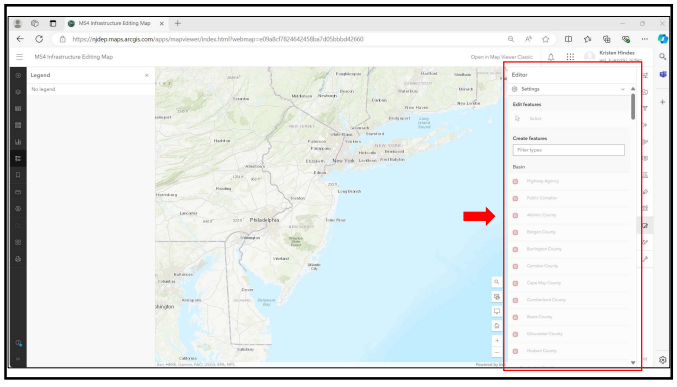

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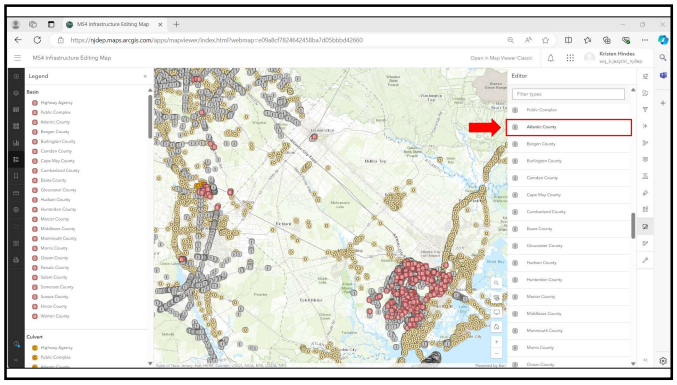

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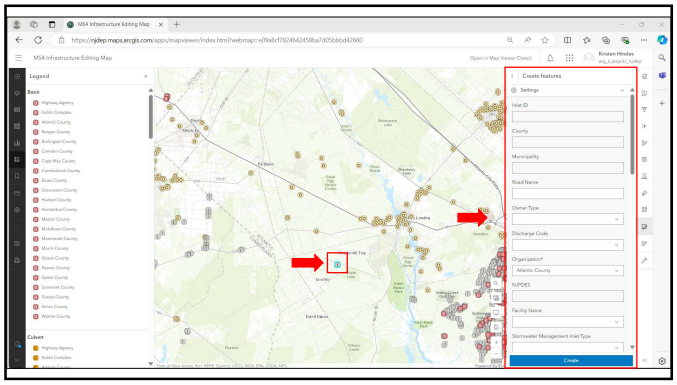

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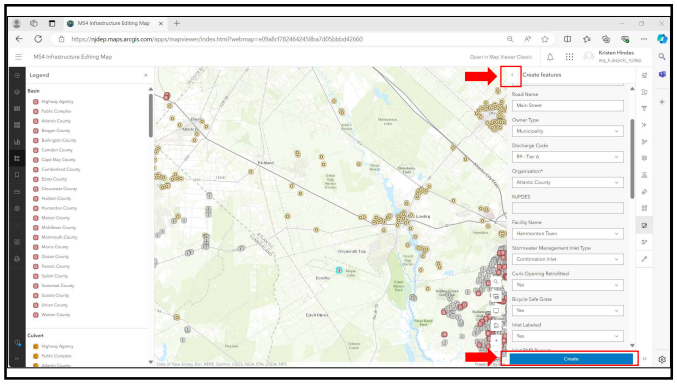

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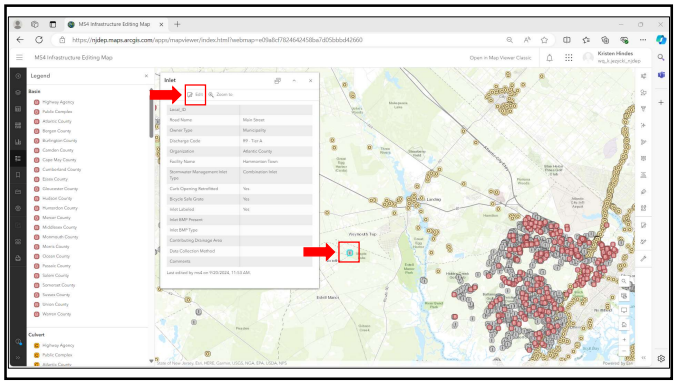

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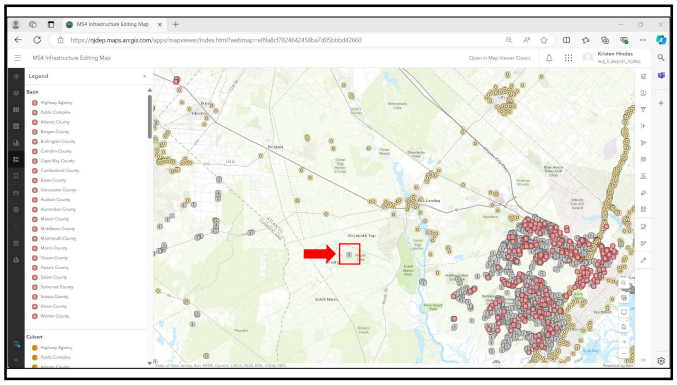

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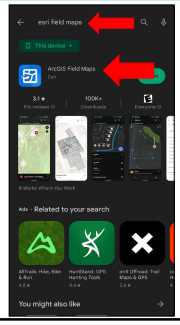
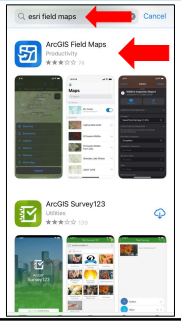
ArcGIS Field Maps App





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Field Maps Data Collection

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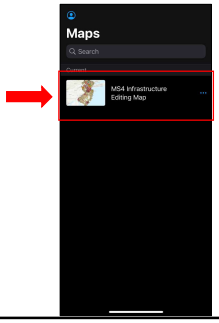
Field Maps Data Collection



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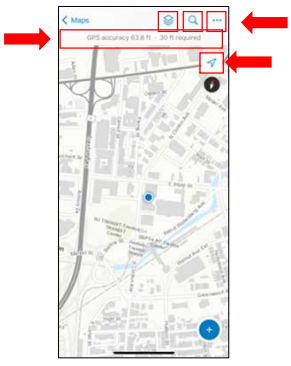

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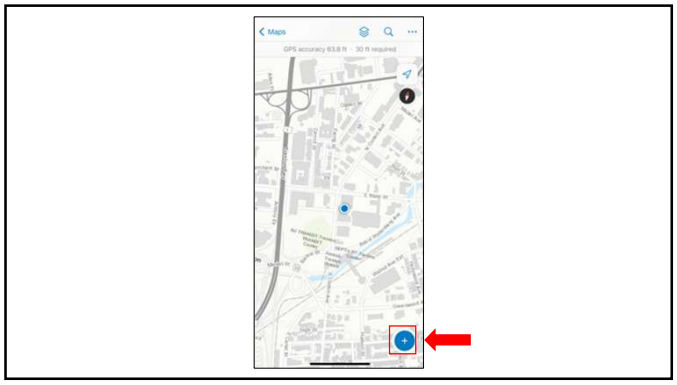
Maps
GPS accuracy 63.8 ft · 30 ft required

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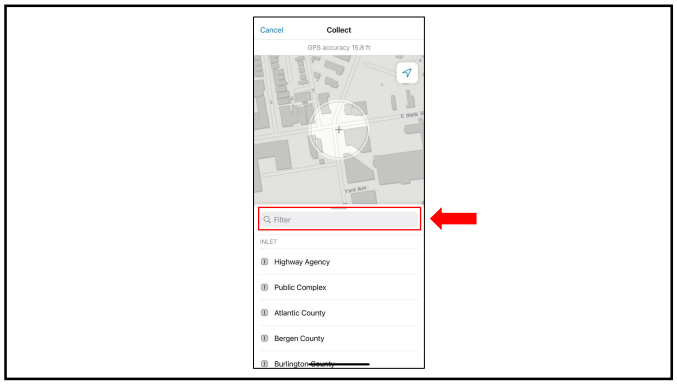
Cancel
Collect
GPS accuracy 15.8 ft
Filter
INLET
Highway Agency
Public Complex
Atlantic County
Bergen County
Burlington County

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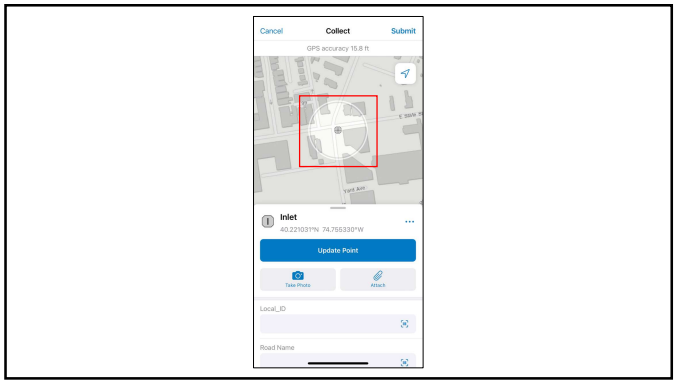
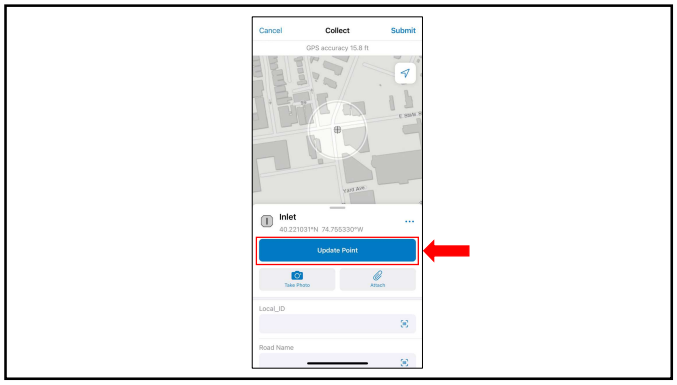

Cancel
Collect
Submit
GPS accuracy 15.8 ft
Inlet
Update Point
Take Photo
Attach
Local_ID
Road Name

45


Cancel
Collect
Submit
GPS accuracy 15.8 ft
Inlet
40.221031°N 74.755330°W
Update Point
Take Photo
Attach
Local_ID
Road Name

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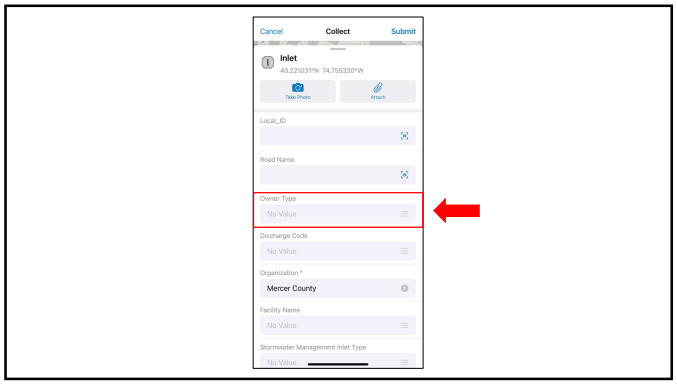
Cancel
Collect
Submit
Inlet
40.221031°N 74.755330°W
Take Photo
Attach
Local_ID
Road Name
Owner Type
No Value
Discharge Code
No Value
Organization *
Mercer County
Facility Name
No Value
Stormwater Management Inlet Type
No Value

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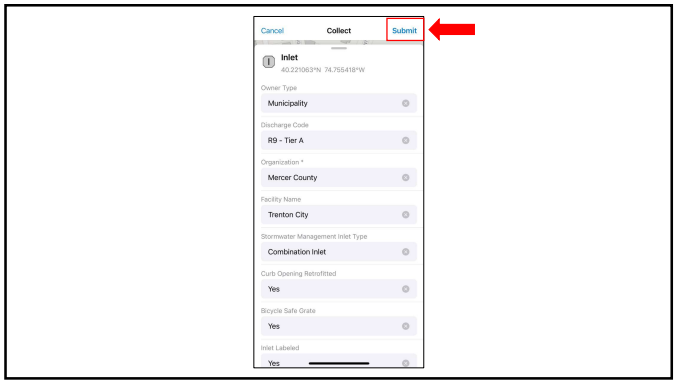
Cancel
Collect
Submit
Inlet
40.221063°N 74.755418°W
Owner Type
Municipality
Discharge Code
R9 - Tier A
Organization *
Mercer County
Facility Name
Trenton City
Stormwater Management Inlet Type
Combination Inlet
Curb Opening Retrofitted
Yes
Bicycle Safe Grate
Yes
Inlet Labeled
Yes

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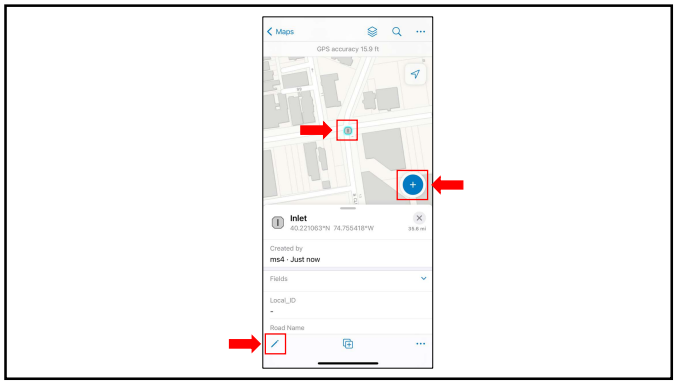

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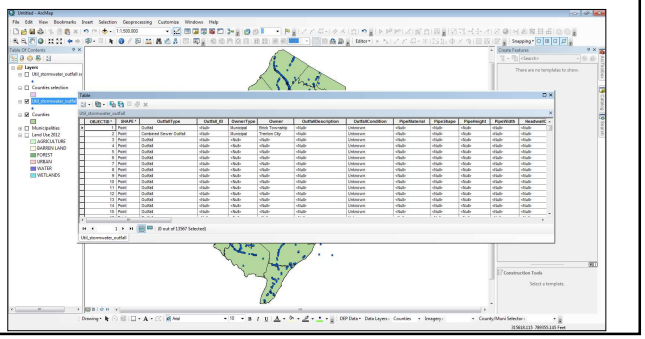
ESRI Geodatabase



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NJDEP Mapping Assistance Summary

- ✓ NJDEP created a database and data dictionary for stormwater infrastructure features
  - ✓ Ongoing updates to account for new mapping requirements in the 2023 Tier A permit and 2024 Public Complex permit
- ✓ Made available over several different collection methodologies to suit the needs of all permittees
- ✓ Existing data can be accessed via NJDEP Open Data
- ✓ Training and assistance is available

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Q & A

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Watershed Inventory Report Requirements

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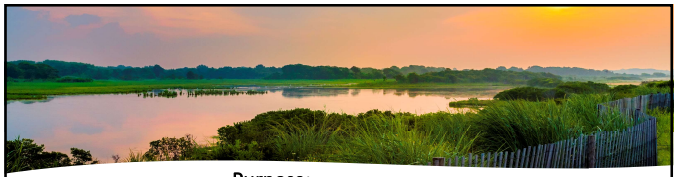

Watershed Improvement Plan

Purpose:

- ✓ Identify opportunities to improve water quality
- ✓ Reduce MS4 contribution of pollutants to waterbodies with impairments & TMDLs
- ✓ Address stormwater flooding to protect human health and safety, and the environment

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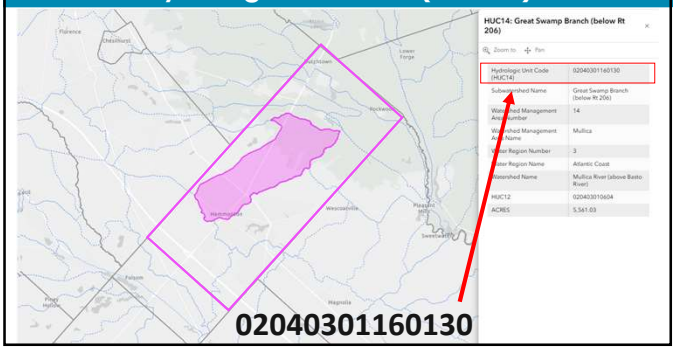
Hydrologic Unit Code (HUC 14)



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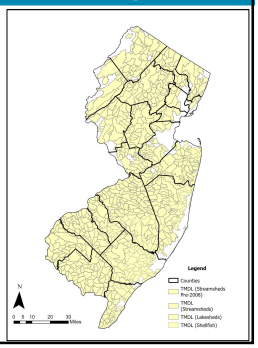
Surface Water Quality in New Jersey

Total Maximum Daily Load (TMDLs)

- ✓Fecal Coliform
- ✓Nickel
- ✓Polychlorinated Biphenyls (PCBs)
- ✓Temperature
- ✓Total Coliform
- ✓Total Phosphorus
- ✓Total Suspended Solids (TSS)
- ✓Volatile Organic Compounds (VOCs)



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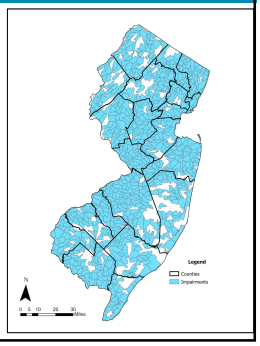
Surface Water Quality in New Jersey

Water Quality Impairments

- ✓Benzo(a) pyrene (PAHs)
- ✓Cadmium
- ✓Chromium
- ✓Copper
- ✓Dissolved Oxygen (DO)
- ✓Enterococcus
- ✓E. Coli
- ✓Lead
- ✓PCBs in Fish Tissue
- ✓pH
- ✓Total Phosphorus
- ✓Temperature
- ✓Total Dissolved Solids (TDS)
- ✓Total Suspended Solids (TSS)
- ✓Turbidity



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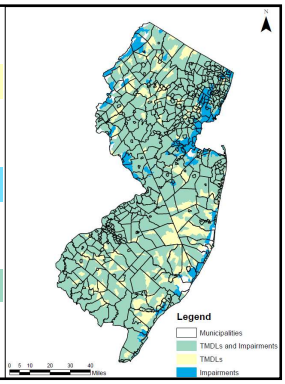
Total Maximum Daily Load (TMDLs)

Water Quality Impairments

TMDLs and Impairments



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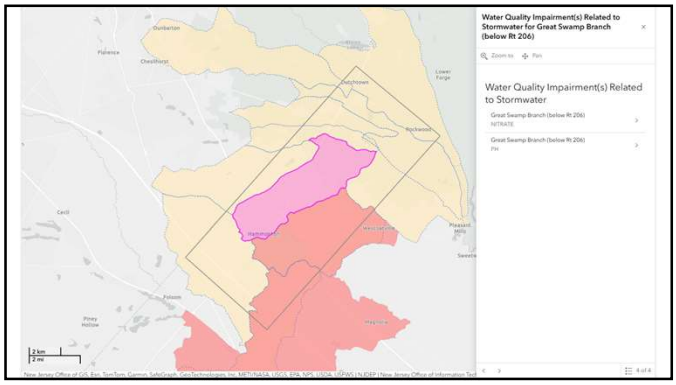

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Pollutant Parameters Related to Stormwater

- ✓**Fecal Coliform, Total Coliform, Enterococcus, & E. coli** – wildlife/pet waste, sewer leaks
- ✓**Total Phosphorus, Dissolved Oxygen (DO), Nitrate, & pH** – fertilizers, leaf litter and other vegetative waste
- ✓**Temperature, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), & Turbidity** – runoff from impervious surfaces, roadside erosion, road salt, leaf litter and other vegetative waste
- ✓**Nickel, Cadmium, Chromium, & Benzo(a) pyrene (PAHs)** – vehicle exhaust, asphalt
- ✓**Polychlorinated biphenyls (PCBs)** – vehicles, building materials
- ✓**Volatile Organic Compounds (VOCs)** – gasoline, paint, solvents
- ✓**Lead & Copper** – old deteriorating pipes

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Watershed Improvement Plan Overview
Phase 1
Watershed Inventory Report
• Due January 1, 2026
• Inventory stormwater infrastructure and analyze subwatershed information
Phase 2
Watershed Assessment Report
• Due January 1, 2027
• Evaluate stormwater inventory and assess potential improvement projects
Phase 3
Watershed Improvement Plan Report
• Due December 1, 2027
• Select and begin implementation of improvement projects

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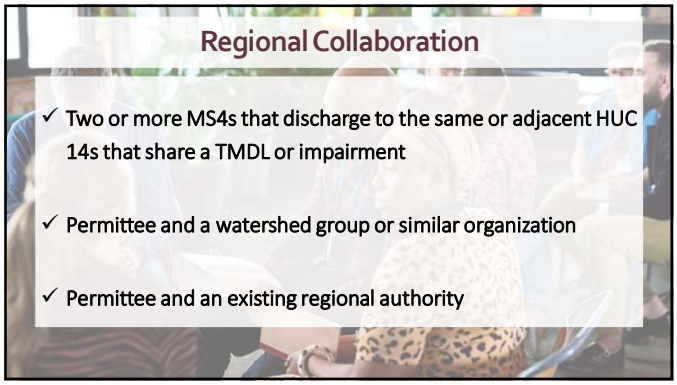
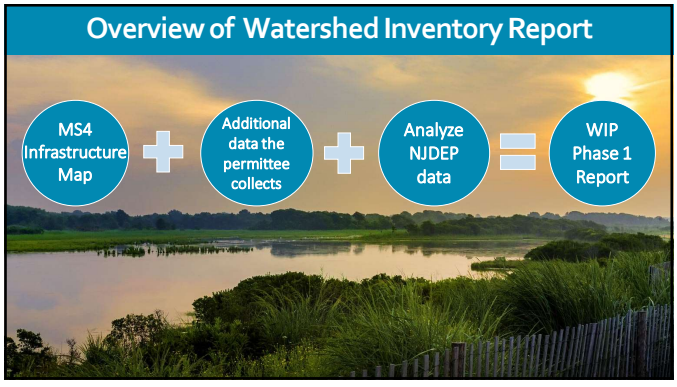
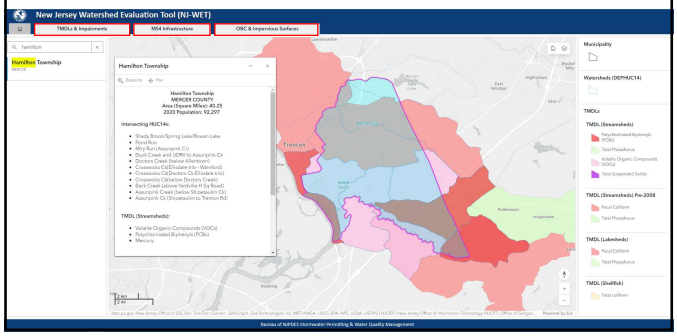

Regional Collaboration
✓ Two or more MS4s that discharge to the same or adjacent HUC 14s that share a TMDL or impairment
✓ Permittee and a watershed group or similar organization
✓ Permittee and an existing regional authority

62


Overview of Watershed Inventory Report
MS4 Infrastructure Map
Additional data the permittee collects
Analyze NJDEP data
WIP Phase 1 Report

63

NJ-WET (New Jersey Watershed Evaluation Tool)



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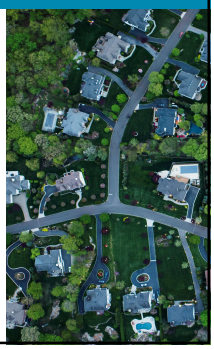
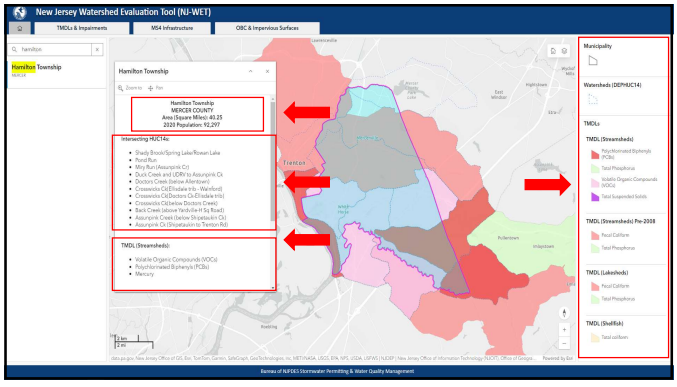
Introduction

- ✓ Location: address, municipality, county
- ✓ Population:
  - ✓ Tier A - Population from 2020 Census
  - ✓ Public Complex– summarize number of individuals present at facility for 6 hours or more a day
- ✓ Demographics
- ✓ Land use types
- ✓ Identify HUC 14s of all subwatersheds that lie within or bordering the permittee
- ✓ Identify area(s) prone to flooding
- ✓ Permittee's goal while creating WIP



65



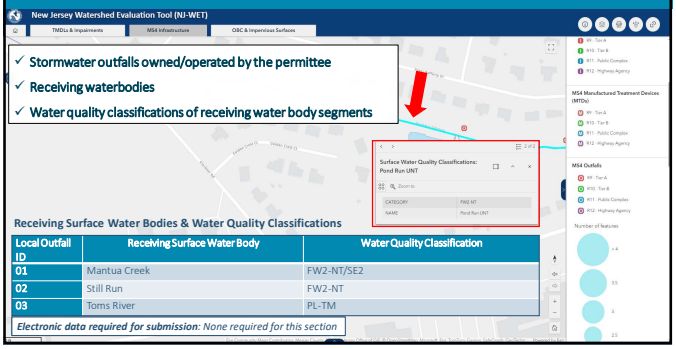
66

Public Participation

- ✓List of stakeholders
- ✓List of meetings held
- ✓Summary of feedback from informational sessions
- ✓Future scheduled meetings

67

Stormwater Outfall(s)



- ✓ Stormwater outfalls owned/operated by the permittee
- ✓ Receiving waterbodies
- ✓ Water quality classifications of receiving water body segments

Receiving Surface Water Bodies & Water Quality Classifications

Local Outfall ID	Receiving Surface Water Body	Water Quality Classification
01	Mantua Creek	FW2-NT/SE2
02	Still Run	FW2-NT
03	Toms River	PL-TM

***Electronic data required for submission**: None required for this section*

68

Stormwater Interconnection(s)

- ✓ Interconnections from the permittee to another entity
- ✓ Interconnections into the permittee from another entity
  Tier A only
- ✓ Submit as a point layer

The following is an example attribute table detailing, at a minimum, what data is required to be submitted for this feature class

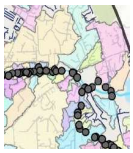
Local ID	Upstream Entity	Downstream Entity
01	TCNJ	Mercer County
02	Hamilton Township	Private
03	Mercer County	Hamilton Township
04	Hamilton Township	Trenton City

***Electronic data required for submission**: interconnections points, showing upstream and downstream entity*

69

Drainage Area(s) for Outfalls & Interconnections

- ✓ Drainage area(s) for MS4 outfalls
  - **Submit as a polygon layer*
- ✓ Drainage area(s) for stormwater interconnections from the permittee to another entity
  - **Submit as a polygon layer*
- ✓ MS4 storm drain inlets



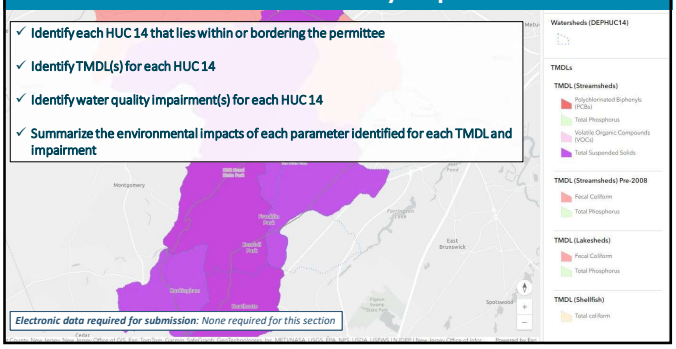
Drainage Area ID	Drainage Area (sq miles/sqft/acres)	Interconnection or Outfall	Primary Contributing Drainage Area Type
01	0.2565	Outfall	Commercial
02	5.2556	Interconnection to County	Industrial
03	95.5356	Outfall	Park or Open Space
04	0.5655	Interconnection to neighboring municipality	Residential
05	84.5256	Outfall	Mixed Use

***Electronic data required for submission**: drainage areas of MS4 outfalls & interconnections from the permittee into another entity*

70

TMDLs & Water Quality Impairments

- ✓ Identify each HUC 14 that lies within or bordering the permittee
- ✓ Identify TMDL(s) for each HUC 14
- ✓ Identify water quality impairment(s) for each HUC 14
- ✓ Summarize the environmental impacts of each parameter identified for each TMDL and impairment



***Electronic data required for submission**: None required for this section*

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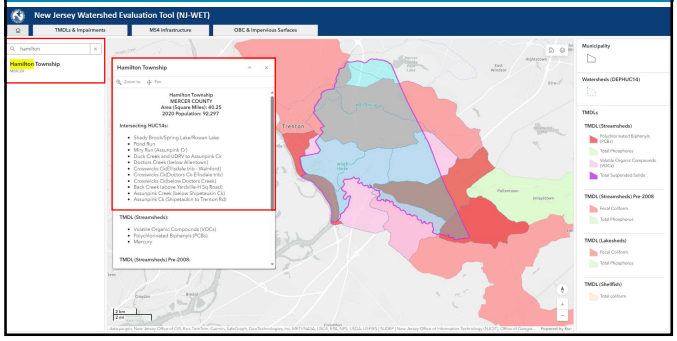
TMDL & Impairment Parameters

HUC14	Subwatershed Name	TMDL(s)	Impairment(s)
00000000000014	Storm Creek (KHK Tributary – NJ River)	Streamsheds PCBs Total Phosphorus Total Suspended Solids (TSS) VOCs	Benzo(a) pyrene (PAHs) Cadmium Chromium Copper
00000000000015	Rain River	Streamsheds Pre-2008 Fecal Coliform Nickel (Streamsheds Pre-2008) Temperature Total Phosphorus	Dissolved Oxygen (DO) Enterococcus E. Coli Lead Nitrate
00000000000016	N Trib to Rain River	Lakesheds Fecal Coliform Total Phosphorus	PCBs in Fish Tissue pH Total Phosphorus
00000000000017	West Creek	Shellfish Total Coliform	Temperature Total Dissolved Solids (TDS) Total Suspended Solids (TSS) Turbidity

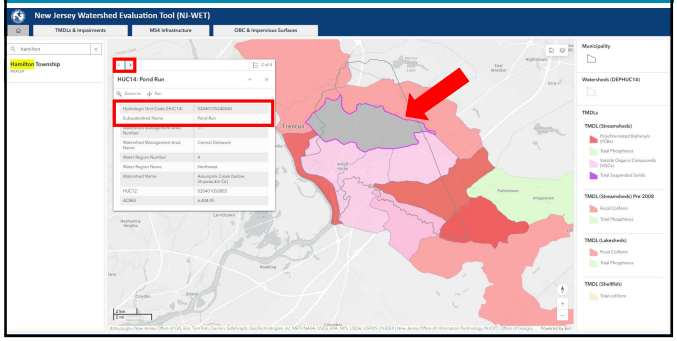
72

Identifying Subwatersheds using NJ-WET



73

How to find Subwatershed Information

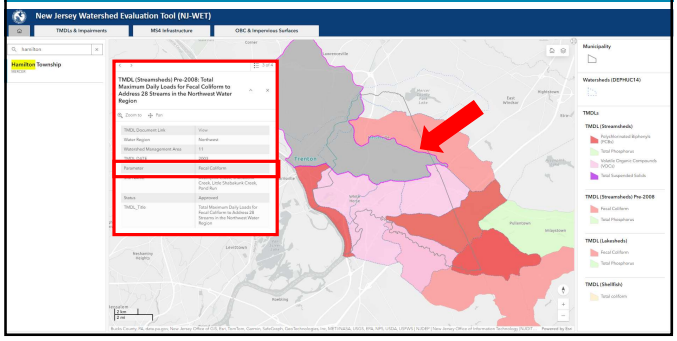


74

HUC 14	Subwatershed Name	TMDL(s)	Impairment(s)
02040105240040	Pond Run		

75

How to find TMDL Parameters



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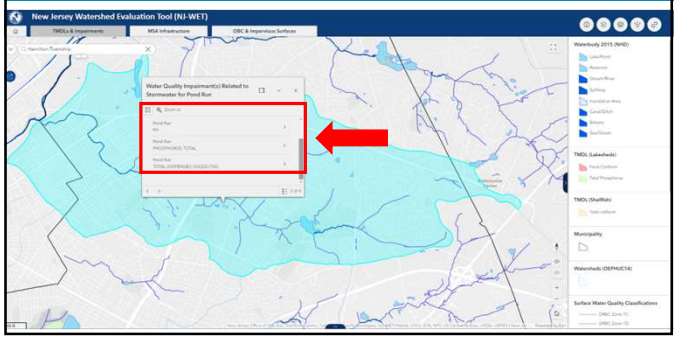
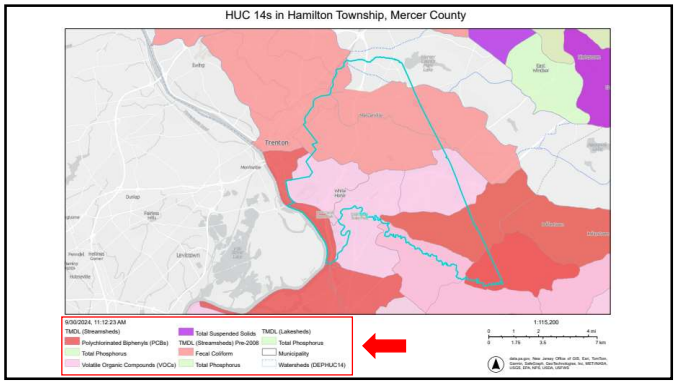
How to find Impairment Parameters



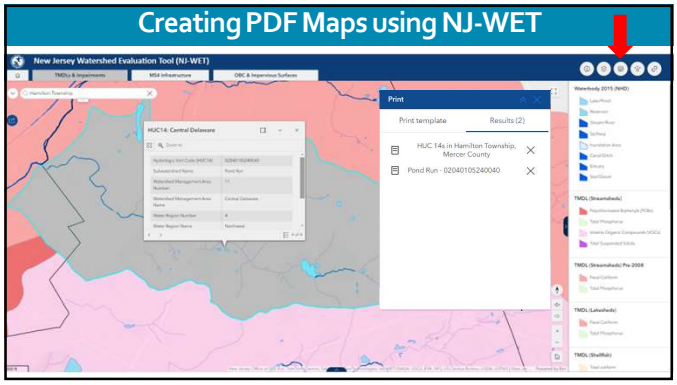
77

HUC 14	Subwatershed Name	TMDL(s)	Impairment(s)
02040105240040	Pond Run	Fecal Coliform	pH Total Phosphorus TSS

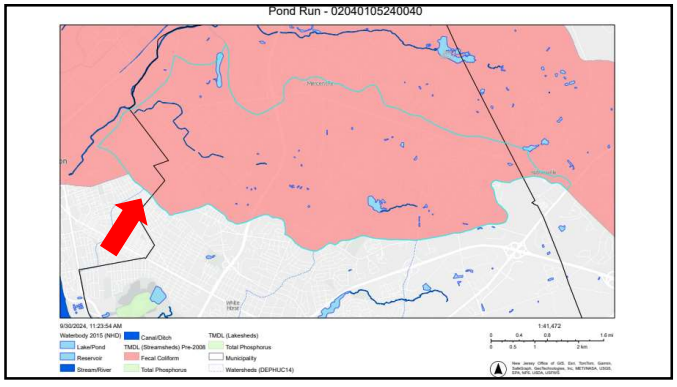
78


HUC 14s in Hamilton Township, Mercer County
Trenton
6/30/2024, 11:12:23 AM
TMDL (Streamsheds)
Polychlorinated Biphenyls (PCBs)
Total Phosphorus
Volatile Organic Compounds (VOCs)
Total Suspended Solids
TMDL (Streamsheds) Pre-2008
Fecal Coliform
Total Phosphorus
TMDL (Lakesheds)
Total Phosphorus
Municipality
Watersheds (DEPHUC14)
1:115,200

79


Creating PDF Maps using NJ-WET
New Jersey Watershed Evaluation Tool (NJ-WET)
Print
Print template
Results (2)
HUC 14s in Hamilton Township, Mercer County
Pond Run - 02040105240040
HUC14: Central Delaware

80


Pond Run - 02040105240040
6/30/2024, 11:23:54 AM
Waterbody 2015 (NHD)
LakePond
Reservoir
StreamRiver
Canal/Ditch
TMDL (Streamsheds) Pre-2008
Fecal Coliform
Total Phosphorus
TMDL (Lakesheds)
Total Phosphorus
Municipality
Watersheds (DEPHUC14)
1:41,472

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Pollutants of Concern

Dissolved Oxygen

Dissolved oxygen (DO) refers to the concentration of oxygen gas incorporated into the water. Oxygen enters the water by direct absorption from the atmosphere and is enhanced by turbulence. Running water, such as that of a swift moving stream, normally contains more dissolved oxygen than the still water of a pond or lake. Water also absorbs oxygen released by aquatic plants during photosynthesis. Sufficient DO is essential to growth and reproduction of aerobic aquatic life (e.g., see Murphy 2006, Giller and Malmqvist 1998, Allan 1995; https://www.epa.gov/caddis-vol2/dissolved-oxygen). Low levels of oxygen (hypoxia) or no oxygen levels (anoxia) can occur when excess organic materials are decomposed by microorganisms. During this decomposition process, the DO in the water is consumed. In some water bodies, DO levels fluctuate periodically, seasonally, and even as part of the natural daily ecology of the aquatic resource. As DO levels drop, some sensitive animals may move away, decline in health, or even die. DO is considered an important measure of water quality as it is a direct indicator of an aquatic resource's ability to support aquatic life. While each organism has its own DO tolerance range, generally, DO levels below 3 milligrams per liter (mg/L) are of concern and waters with levels below 1 mg/L are considered hypoxic and are usually devoid of life.

Stormwater runoff containing nutrients such as nitrate, phosphorus, and organic TSS matter and animal and pet waste cause the levels of dissolved oxygen to decrease in the receiving waters. An increase in these materials transported via stormwater runoff will have a greater impact on receiving waters.

MS4 permit conditions that regulate this parameter:

- Pet Waste Ordinance
- Wildlife Feeding Ordinance
- Litter Control Ordinance
- Improper Disposal of Waste Ordinance
- Yard Waste Ordinance
- Street Sweeping Program
- Herbicide Application Management
- Roadside Vegetative Waste Management
- Roadside Erosion Control
- Inspection and Maintenance of Stormwater Facilities
- Stream Scouring Program
- Illicit Discharge Detection and Elimination Program

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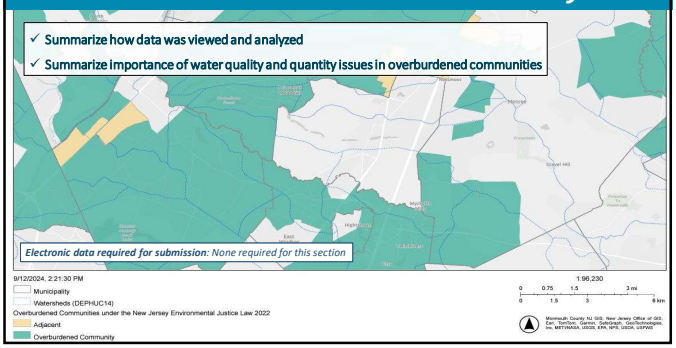
Overburdened Communities – *Tier A only*

- ✓ Summarize how data was viewed and analyzed
- ✓ Summarize importance of water quality and quantity issues in overburdened communities



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Impervious Area

- ✓ Summarize how data was viewed and analyzed
- ✓ Identify the percent impervious cover in each subwatershed within the permittee's jurisdiction
- ✓ Summarize the impervious cover effects on ecosystems and stream health

84

Non-Municipally Owned/Operated SWFs – *Tier A only*

- ✓ Summarize how data was collected
- ✓ Identify type of infrastructure
- ✓ Identify quantity for each type of infrastructure
- ✓ Identify owner of each infrastructure

Local ID	Type	Owner
01	Inlet	Wawa
02	Infiltration basin	Pond Creek HOA
03	Outfall	Pond Creek HOA

***Electronic data required for submission**: non-municipally owned/operated stormwater facilities*

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Watershed Inventory Report Resources

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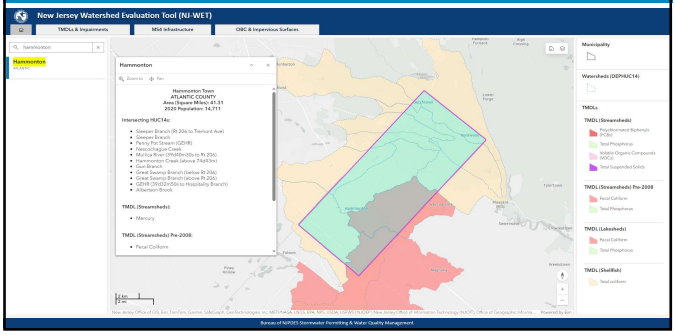
NJ-WET (New Jersey Watershed Evaluation Tool)



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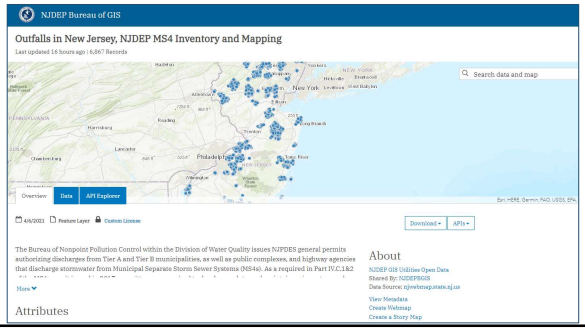
NJDEP Open Data



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TMDL Lookup Tool

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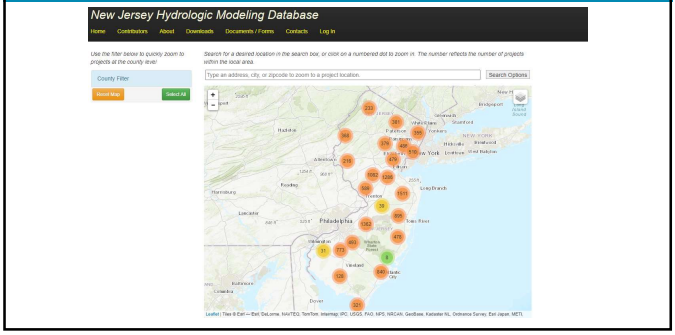
H&H Database



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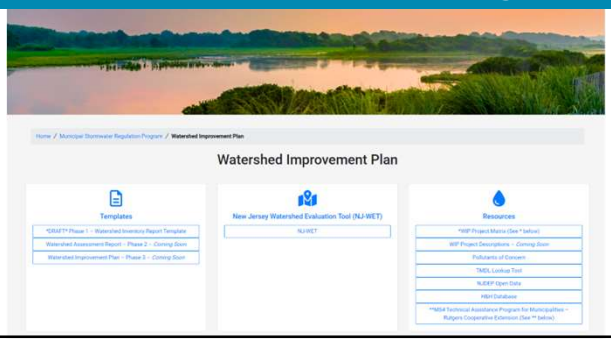
MS4 Unit WIP Guidance Webpage



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CONTACT US

Bureau of NJPDES Stormwater Permitting & Water Quality Management

stormwatermanager@dep.nj.gov

https://dep.nj.gov/njpdes-stormwater/

County Case Manager List

Technical Training EXIT SURVEY

EXIT SURVEY: Technical Training
03/26/2025

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