Inventory and Assessment of Stormwater Infrastructure
Welcome to NJDEP’s stormwater website for stormwater management professionals and permittees. Here you’ll find links to technical information, guidance materials, forms, and applications. General guidance and resources regarding stormwater runoff are also available at www.cleanwaternj.org.
Identifying and Assessing Stormwater Infrastructure

Before an assessment can be completed, stormwater infrastructure must be located and identified such as:

- Detention Basins
- Retention Basins
- Other Stormwater Best Practices Management (BMPs)
- Manufactured Treatment Devices (MTDs)
- Catch Basins
- Stormwater Piping
- Outfalls
Other Stormwater Management Practices

Bioretention Systems
Other Stormwater Management Practices

Constructed Wetlands
Other Stormwater Management Practices

Infiltration Basin
Other Stormwater Management Practices

Pervious Paving Systems
Other Stormwater Management Practices

Rooftop Vegetated Cover

Parker Urban Greenscapes. 2009.
Other Stormwater Management Practices

Sand Filters
Other Stormwater Management Practices

Grass Swales
Other Stormwater Management Practices

Dry Wells
Other Stormwater Management Practices

Manufactured Treatment Devices (MTDs)
The Benefits of Stormwater Infrastructure Inventory and Assessment

- Identify maintenance needs
- Reduce replacement and repair needs
- Reduce liability
- Support development of alternative maintenance programs
- Translate into reduced long-term costs
Improved Maintenance Results

✓ Reduced pollution of local waterways
✓ Reduced stream channel erosion
✓ Reduced flooding
✓ Enhanced climate resiliency
State Regulations: Outfall Mapping and Illicit Connections
State Regulations: Outfall Pipe Stream Scouring Remediation
What Other Stormwater Facilities to Inventory

✓ Stormwater management basins
✓ Outfalls pipes
✓ Subsurface retention/detention systems
✓ Manufactured treatment devices (MTDs)
✓ Green infrastructure
Beyond State Regulations – Mapping Catch Basins and Piping
Minimum Information Collected in an Inventory

- Type of Stormwater Facility
- Coordinates in accordance with NJDEP GIS Protocol
- Road Name
- Owner
- Tax Map Number
- Block and Lot
- Unique Identification Number
Mapping
Inventory and Assessment Case Study: Hamilton Township
### Stormwater Infrastructure Assessment Program

#### Stormwater Basin Inspection Checklist

**General Information**
- Site ID: [BLANK]

<table>
<thead>
<tr>
<th>Name(s) person inspecting the basin:</th>
<th>Date:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Location Address and Cross Streets:</th>
<th>Watershed:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Name of Creek, Stream, or area into which the basin discharges:</th>
<th>Property Owner / Tax Parcel Block &amp; Lot:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Contact Information:</th>
</tr>
</thead>
</table>

#### Structural Components

<table>
<thead>
<tr>
<th>Basin description, size and depth:</th>
<th>Is the basin accessible to maintain?</th>
<th>Yes / No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Is it maintained: Mowed, clear of woody plants, inlet/outlet blockages?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Inlets:</th>
<th>Outlet diameter:</th>
</tr>
</thead>
</table>

#### General Observations

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Notes/Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Any reports on the basin not functioning?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Are there any unauthorized or malfunctioning structures in the basin?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Are there concrete or flow channels? Is the water entering the basin directly exiting the basin outlet without coming in contact with the basin bottom soil and vegetation?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Is there standing water or evidence of standing water in the basin?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Inlet/S

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Notes/Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Signs of breakage, damage, corrosion or rusting of inlet structure/pipes?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Debris or sediment accumulation in or around the inlet coping or the inlet opening/site?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Signs of erosion, scour or gullies, root or vegetation above or around the inlet structure?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Tree roots, woody vegetation growing close to or through the inlet structure or a situation impacting the structure's integrity?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) If the inlet has a pretreatment structure (trash rack, screen) is it filled with debris or sediment?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Basin

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Notes/Remarks</th>
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</thead>
<tbody>
<tr>
<td>1) Accumulation of debris or litter within basin?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Exposed dirt or earth visible, are there areas without vegetation or where turf is damaged?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Excess sediment accumulation in the basin?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Basin wall/embankment eroded, slumping, caved or being undermined?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Stormwater Infrastructure Assessment Program

#### Stormwater Outfall Inspection Checklist

**General Information**
- Site ID: [BLANK]

<table>
<thead>
<tr>
<th>Name(s) person inspecting the outfall:</th>
<th>Date:</th>
</tr>
</thead>
</table>

<table>
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<tr>
<th>Location Address and Cross Streets:</th>
<th>Watershed:</th>
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<tr>
<th>Name of Creek, Stream, or area into which the outfall discharges:</th>
<th>Property Owner / Tax Parcel Block &amp; Lot:</th>
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<th>Contact Information:</th>
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#### Structural Components

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<tr>
<th>Outfall description:</th>
<th>Is the outfall accessible to maintain?</th>
<th>Yes / No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Is it maintained: Mowed, clear of woody plants, blockages?</td>
<td></td>
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<table>
<thead>
<tr>
<th>Outfall Material:</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Weather over past 24 Hours:</th>
<th>Outlet diameter:</th>
</tr>
</thead>
</table>

#### General Observations

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<th>Yes</th>
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<th>Notes/Remarks</th>
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</thead>
<tbody>
<tr>
<td>1) Any reports on the outfall not functioning?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Are there any unauthorized or malfunctioning structures connected to the outfall?</td>
<td></td>
<td></td>
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</table>
Assessment Tool
Esri Collector Application

• Free mobile application
• No equipment to purchase
• Android and Apple Compatible
• Easy to use
• Easy to upload and share
• Available offline
Using the Collector Application in four simple steps

1) Launch Collector 2) Choose Application 3) Tag Location 4) Answer Questions
Case Study: Hamilton Township
Case Study: Hamilton Township Results

A webmap that combines the geographic information with the answered question.
Detention Basin vs. Retention Basin

Does the basin hold a permanent pool of water?

NO – Detention

YES – Retention or Wet Pond
Common Concerns with Detention Basins

1. Embankment and outlet stabilization
2. Sedimentation
3. Outlet blockages
4. Broken or clogged low-flow channels
5. Standing water or wet soils
6. Floatables and debris
7. Weeds or woody vegetation
#1 Embankment and Outlet Stabilization

Embankment Destabilization

Outlet Destabilization
#2 Sedimentation

Accumulation of sediment in basin
#3 Outlet Blockage

Outlet blockage by debris

Outlet blockage by sediment
#4 Broken or Clogged Low-Flow Channels

Broken low-flow channel

Clogged low-flow channel
#5 Standing Water or Wet Soils

Standing water in detention basin
#6 Floatables and Debris

Accumulation of floatables in basin

Basin is a dumping ground
#7 Weeds and Woody Vegetation

Woody vegetation in basin

Invasive species have overtaken the basin
Common Concerns for Wet Ponds

- Embankment and outlet stabilization
- Outlet blockages
- Sedimentation
- Floatables and Debris
- Lack of shoreline buffer
- Excessive algal growth
Shoreline Buffer
Excessive Algae Growth
Wet Ponds in Good Condition
Common Concerns with Stormwater Outfalls

1. Stream erosion or scouring resulting from discharge
2. Poor pipe condition
3. Discharge of floatables
4. Discharge of excessive sediment
5. Color of the water discharging
6. Discharging during dry weather conditions
7. Outfall overgrown with vegetation
8. Structural integrity of headwall or other supporting structure
#1 Stream erosion or scouring resulting from discharge

Outfall is causing erosion

Outfall is causing scouring
#2 Poor pipe condition

Crumbling concrete outfall pipe or pipe sections falling into stream
#3 Discharge of Floatables

Accumulation of floatables from outfall

Garbage in the stream
#4 Discharge of excessive sediment

Outfall pipes can discharge excessive sediment into the local waterway.
#5 Color of the water discharging

Stormwater seems very cloudy – could be a cross connection with sanitary sewer pipe
#6 Discharging during dry weather

Could be an illicit connection – water quality testing should be done
#7 Outfall overgrown with vegetation

Outfall capacity is limited due to overgrowth of vegetation
#8 Structural integrity of headwall

Concrete headwall is crumbling
Inventory and Assessment Case Study: Hamilton Township
E-learning Tool Available

• A **FREE** interactive online E-learning tool is available [http://water.rutgers.edu/E-learning.html](http://water.rutgers.edu/E-learning.html)

• The tool showcase how municipalities can comply with the new MS4 permits
Questions?

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