



**Visual Assessment  
of  
Industrial Storm Water  
Discharges**

# Housekeeping

- All lines will be muted
- Questions can be sent to us via the question/chat box
- We will use polls during the webinar
- We will record webinar and post online

A white pickup truck with a cargo box is parked on a wet, paved industrial area. In the background, there is a green dumpster, a blue metal structure, and some debris on a pallet. A storm drain is visible in the foreground.

# Visual Assessment of Industrial Storm Water Discharges

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# Why is there a need to monitor storm water runoff?

- Storm water runoff has a major impact on water quality
- Storm water permits were developed so that industrial operations could be proactive
- Management of controls at the facilities effects the quality of the runoff
- Without monitoring we don't know the quality of the runoff

Observe the discharge to assess effectiveness of the control measures



# Visual Assessment components

1. Written procedures
2. Sample collection
3. Assessment
  - Discharge at time of collection
  - Sample collected at time of discharge
  - Documentation

# Visual Assessment of Storm Water Discharges

- Included as a component (part) of the comprehensive inspection
- Comprehensive inspections conducted quarterly
- Or on an department approved alternative schedule
- Conducted by the Industrial Storm Water Certified Operator

# Written Procedures



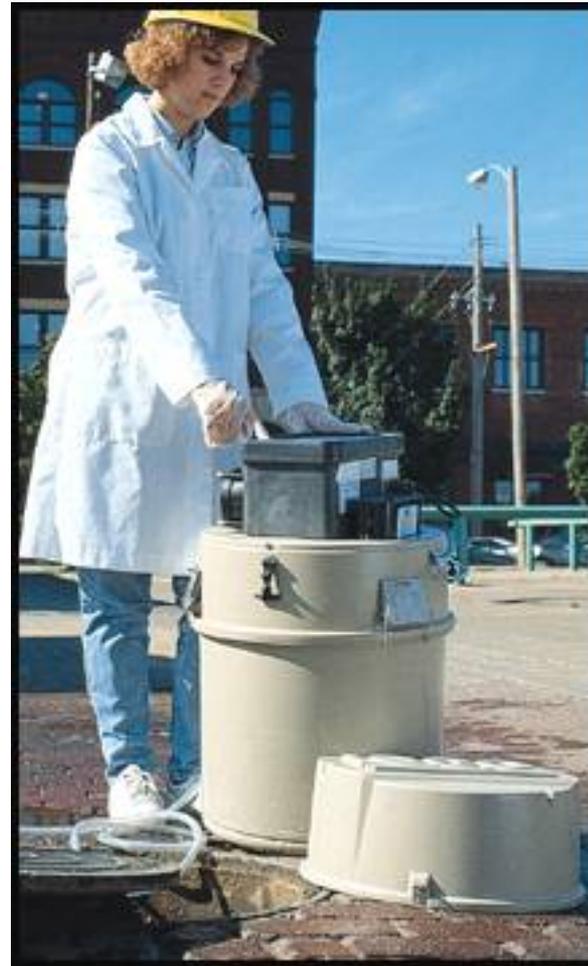
# Develop Procedures

- Written procedures for conducting the visual assessment
  - Developed within 6 months of Certificate of Coverage or Individual Permit issuance or reissuance
  - Incorporated into the Storm Water Pollution Prevention Plan, Comprehensive Inspection section
  - Determined to be acceptable as part of the SWPPP review.

# Written Procedures Include

- Identifying those who will be conducting the visual assessment
  - Certified Operator must be a Industrial Storm Water Certified Operator
  - Staff working in conjunction with or under the supervision of the Certified Operator

# Written Procedures- Sample Collection



# Discharge Points

- Identification of Discharge Points-location where storm water is discharged from the property-Two types of Discharge points



Outfalls

- Stream
- County Drain
- Lake
- Wetland

Points of Discharge

- On site catch basins
- Trench drains
- In street catch basins
- Conveyance to road side ditch

# Discharge Points - Outfalls

- Direct discharges to surface waters





# Discharge Points-

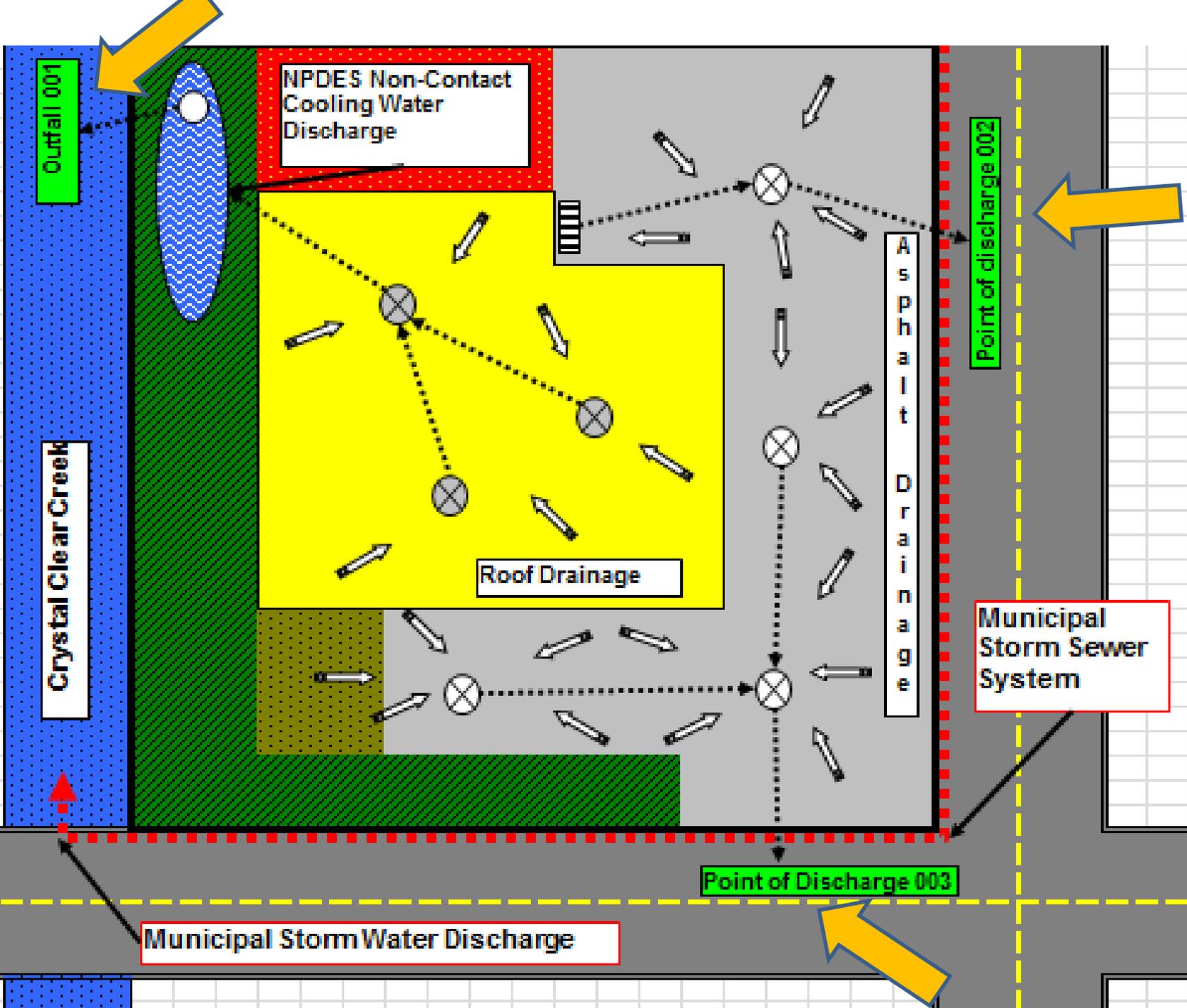
Discharges to a separate storm sewer system

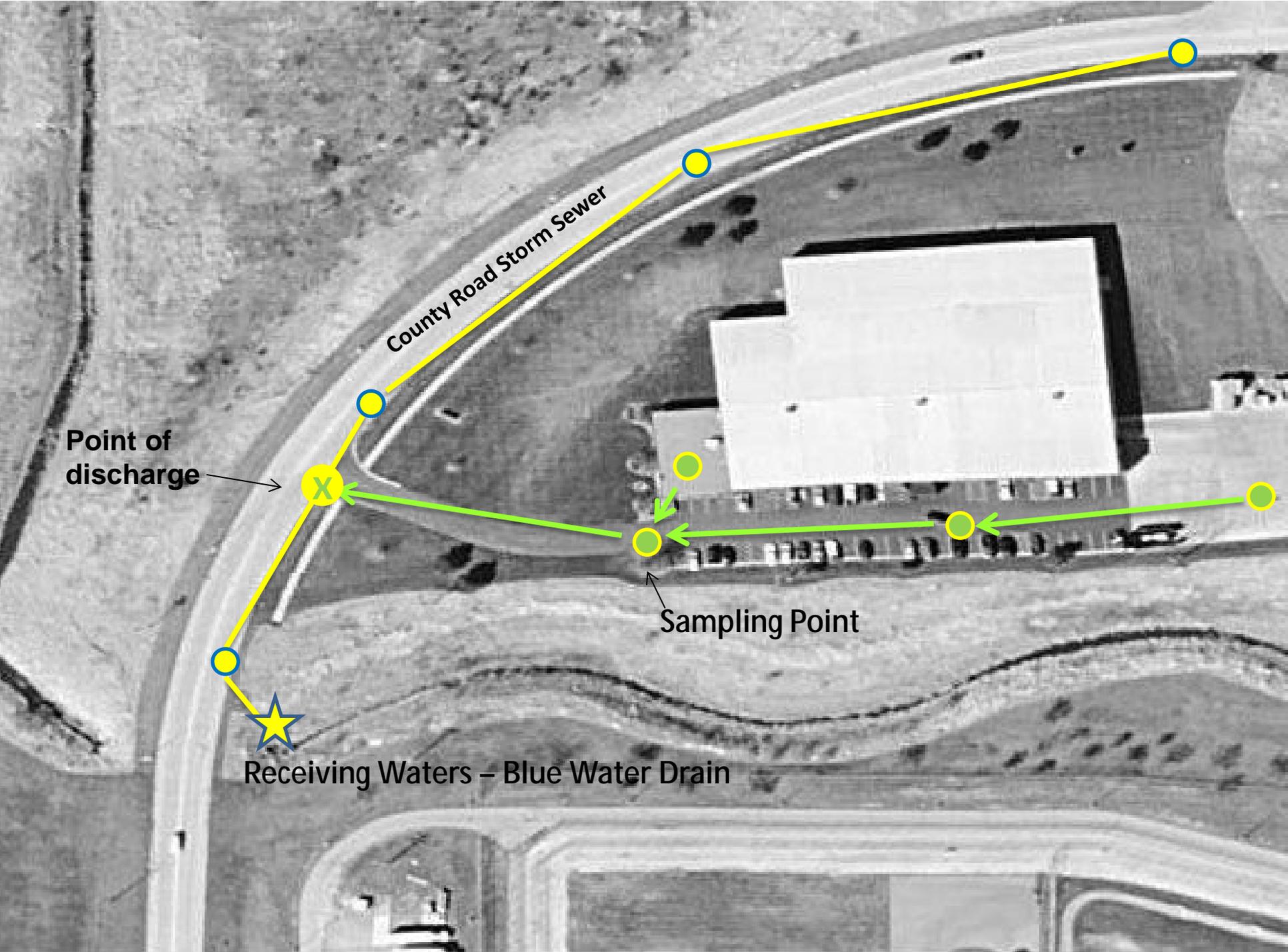
(Point of discharge)



# Points of Discharge







County Road Storm Sewer

Point of discharge

X

Sampling Point

Receiving Waters - Blue Water Drain



# Multiple Discharge Points

- Substantially identical storm water effluent
- Conduct Visual Assessment at one of the discharge points



# Substantially Identical Discharge Points

- How is this determined?
  - Look at the significant materials evaluation or inventory
    - Significant materials
    - Industrial Activities
  - Indicated on SWPPP site map



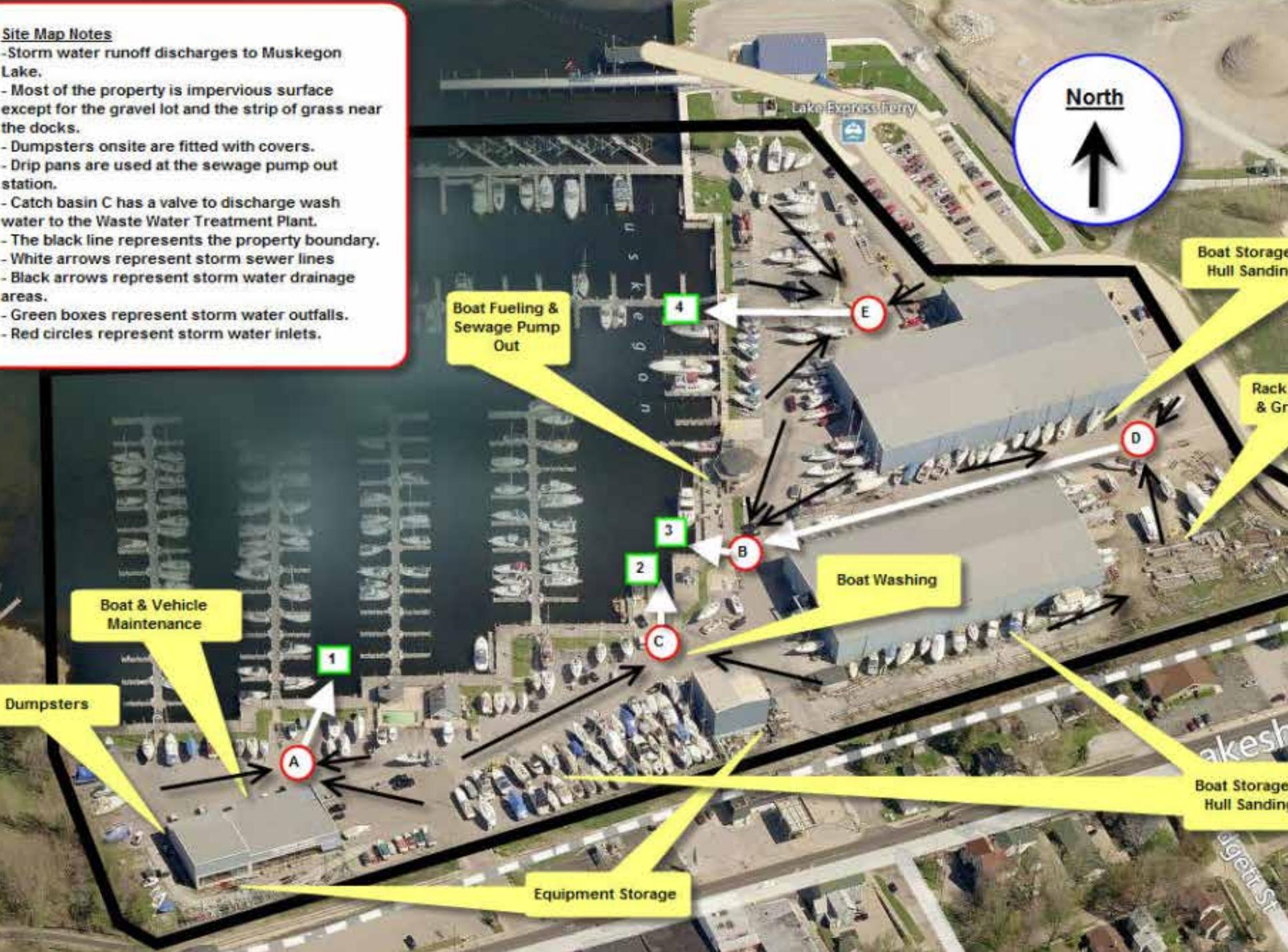
### 13.0 TABLE 1 – SIGNIFICANT MATERIAL INVENTORY AND DESCRIPTION OF INDUSTRIAL ACTIVITY OR SIGNIFICANT MATERIAL STORAGE AREAS

**Instructions** - The intent of this table is to ensure that facilities comply with Part I, Section C.1.b. of their industrial storm water permit. See sample table in Section 26 for reference. Fill out the applicable areas or activities in the corresponding sections. Add more lines as needed. Once you have described the area or activity, list the significant materials that are associated with the areas or activities, the exposure methods, and evaluate the level of exposure. Once that is completed indicate the inlet(s) and outfall(s) that would be impacted if significant materials were discharged from the areas or activities described.

Section Listed in General Permit	Storage Areas / Activity Areas	Significant Materials	Exposure Method	Reasonable Potential Evaluation (high,medium,low)	Inlet(s)	Outfalls(s)
1) Loading, unloading, and other material handling operations	1) Boat maintenance area	Oil, battery acid, diesel fuel, gasoline, and other fluids	Spillage during material handling activities	High	A	1
	2) Fueling area	Gasoline, diesel fuel	Spillage during fueling activities	High	NA	Direct Discharge
2) Outdoor storage including secondary containment structures	1) Boat storage area	NA	Outdoor storage	Low	C, D	2, 3
	2) Equipment storage area	Grease, hydraulic oil	Outdoor storage	Medium	A, C	1, 2
	3) Rack storage	Rusting of metal	Outdoor storage	Low	D	3
3) Outdoor manufacturing or processing activities	NA					
4) Significant dust or particulate generating processes	1) Boat hull sanding	Paint dust, fiberglass dust	Outdoor maintenance activities	High	C, D	2, 3
5) Discharge from vents, stacks, and air emission controls	NA					

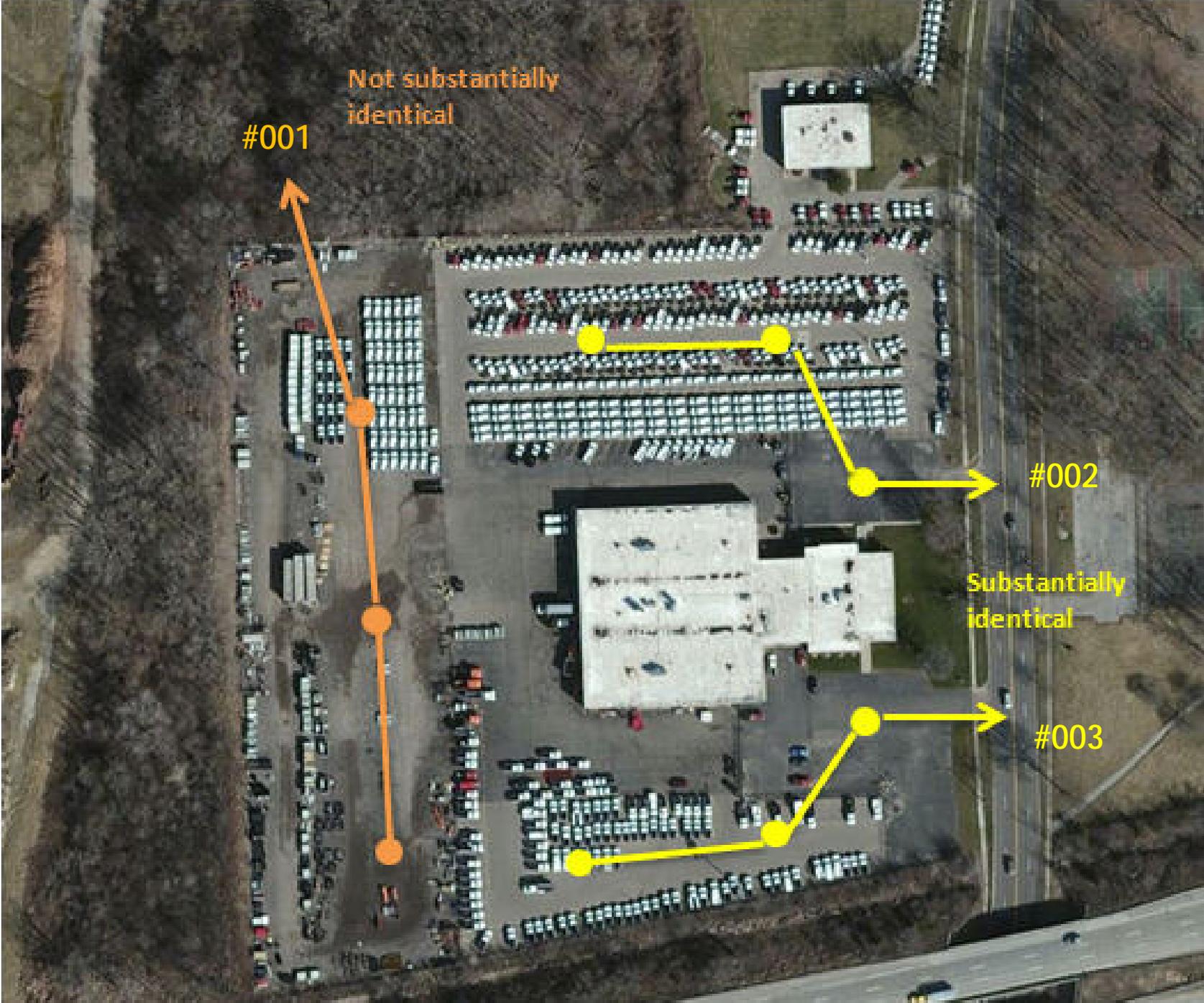
### Site Map Notes

- Storm water runoff discharges to Muskegon Lake.
- Most of the property is impervious surface except for the gravel lot and the strip of grass near the docks.
- Dumpsters onsite are fitted with covers.
- Drip pans are used at the sewage pump out station.
- Catch basin C has a valve to discharge wash water to the Waste Water Treatment Plant.
- The black line represents the property boundary.
- White arrows represent storm sewer lines
- Black arrows represent storm water drainage areas.
- Green boxes represent storm water outfalls.
- Red circles represent storm water inlets.



## Evaluation of Reasonable Potential for Contribution of Significant Materials to Storm Water Runoff

Significant Material	Quantity of Material	Storage Area or Process	Method of Exposure	Potential for Exposure to Storm Water	Outfall Through Which Material may be Released	Past Spills
Diesel	3,000 gallon	Fueling area and in saddle tanks of trucks parked at the facility	Spillage during fueling of trucks, filling of bulk fuel tank, fuel line damage, ruptured saddle tank	Medium to high for truck fueling, low for others	001, 002, 003	Vendor overflow tank in 2012 and spilled 200 gallons on ground near tank
Oils (crankcase),	Used oil tank 500 gallons	Individual trucks, used oil tank for oil burner	Leakage from trucks	Medium	001, 002, 003	
Hydraulic oils	250 gallon tote	Tote in shop, in trucks parked at the facility, and in shop forklift	Leakage from hoists under dump boxes	High for trucks parked in yard, low for tote in shop	001, 002, 003	
Trash from maintenance shop	dumpster	Dumpster next to Maintenance building	Dumpster left open allowing storm water to contact trash, Material left on ground around dumpster	Medium	001	



#001

Not substantially identical

#002

Substantially identical

#003

# Unregulated areas

- Areas without industrial activity
  - Customer or Employing Parking Areas
  - Lawn



*Camera: Nikon D3s. Lens: Nikkor 17-35mm @ 35mm. Exposure: 1/250th sec. @ f14.*

# Unregulated discharges

- Areas that do not discharge directly or indirectly to surface waters
  - Combined sewer discharges
  - Ground water discharges
  - Sanitary sewer

# Written Procedures

- Part of the Storm Water Pollution Prevention Plan
- Reviewed to determine if they meet requirements of permit
- Changes may be required

# Sample Collection and Discharge Observations:



# Sample Collection From Discharge Points



A dramatic sky filled with dark, heavy clouds, suggesting an approaching storm. The bottom of the image shows a dark silhouette of a tree line against a lighter, overcast sky. The text "Have your collection equipment ready" is overlaid in a bright yellow font across the middle of the image.

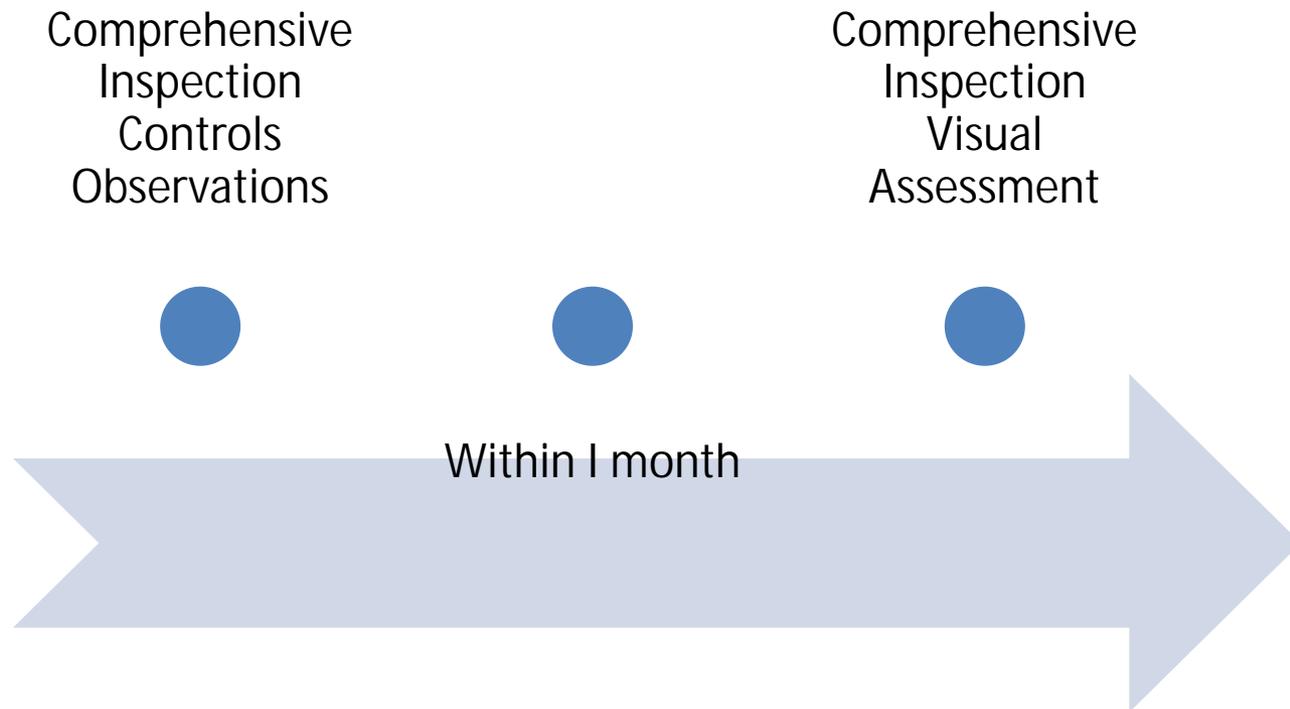
Have your collection equipment ready

# Frequency

- As often as the comprehensive inspection
  - Once in each quarter
    - January-March
    - Apr-June
    - July-September
    - October-December
  - According to Approved Alternative Schedule

# Sample Collection and Observations

- Timing
  - Within 1 month of the control measure observations



# Timing

- Within 1 month of the control measure observations



# Sample Collection and Observations Timing

- At least 72 hours from a previous storm event (qualifying storm event)
- Within 30 minutes of beginning of the storm water **discharge** (first flush)
- Within 60 minutes if not possible to do in 30 minutes (document why)





Discharge structure with valve

# Sample Collection and Observations

- Collect storm water discharge sample in a clean clear container
- Collect a sample that is representative of the discharge



- Adverse Weather Conditions
  - If unable to conduct assessment
  - Conduct Assessment during next qualifying storm event



# Adverse weather conditions

- Defined
  - Dangerous conditions or conditions that create inaccessibility for personnel
    - Flooding
    - Electrical Storms
    - High winds
    - Icy conditions
  - Situations that make sampling impossible(no discharge)
    - Drought
    - Extended frozen conditions

- Documentation for not conducting visual assessment



# Sample collection from Structural Controls



# Cold Weather Visual Assessments

- For snowmelt- during a period with a measureable discharge



# Collecting the Sample

Determine how you will collect the sample

**street sampler**



**driveway sampler**



**roof sampler**



**lawn sampler**

# Specialized Equipment



# Sample Collection and Observation Alternatives?

- Automated samplers
  - The visual assessment of the sample must be conducted by the Certified Operator within 48 hours of sample collection
    - Mix prior to visual examination
  - Include in written procedures



# Alternatives

- Certified Operator is not available?
  - Use staff that have received appropriate training for taking the storm water sample
  - Use a device to visually record the discharge (optional)



# Staff Training

- View webinar
- Provide documentation that staff assisting in the visual assessment have received the appropriate training
- Included in Written Procedures

# Sample storage

- Assessed after collection or
- Ensure that the sample is properly stored
- Storage procedures  
Included in  
written procedures



# Visual Assessment

- Storm water discharging
- Sample collected at time of discharge

- Observations of the discharge

- Color
- Turbidity (cloudiness)
- Oil Film (sheen)
- Floating Solids
- Foams
- Settleable solids
- Suspended solids
- Odor



# Color



# Turbidity



# Petroleum Sheens or Films



# Floating Solids



# Foams



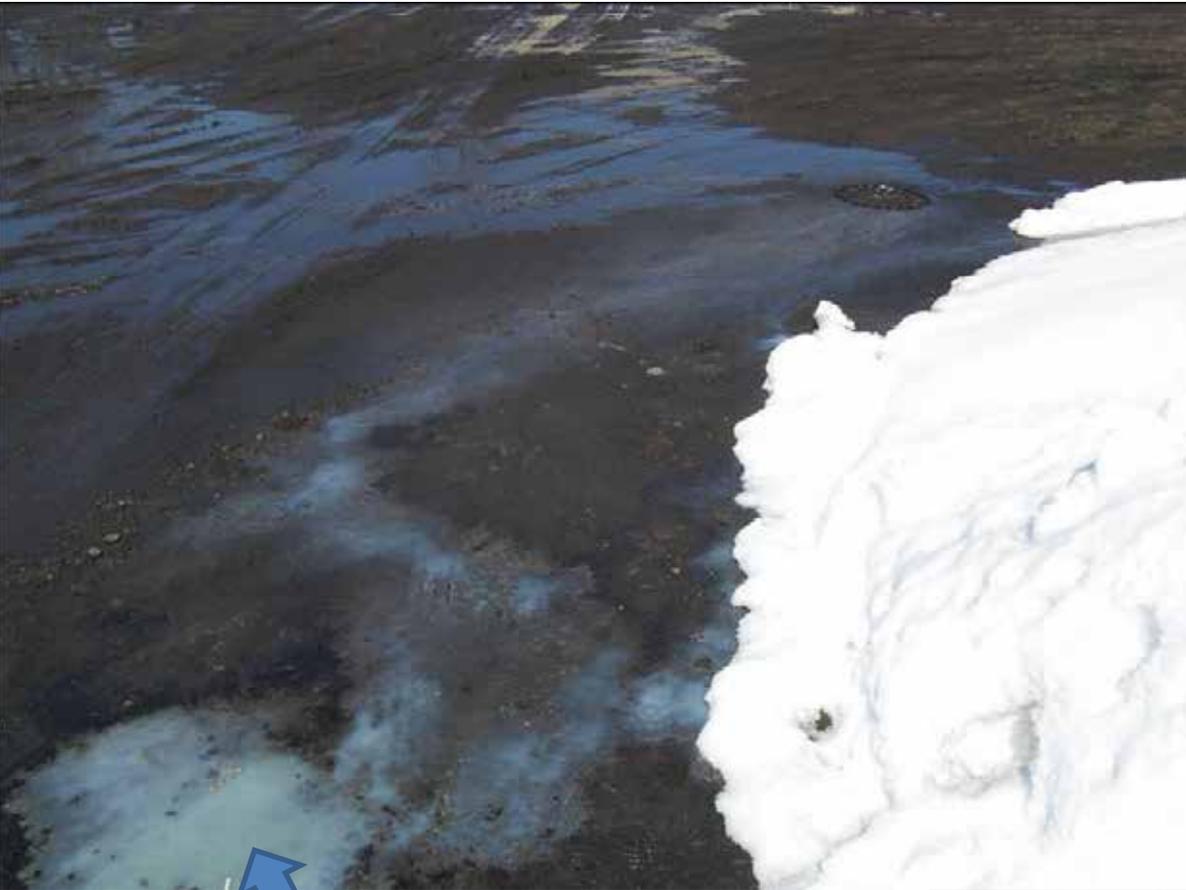
# Settleable Solids



# Suspended Solids



# Suspended Liquids



Water with soluble oils



# Odors



# Combinations



# Combinations



# Naturally Occurring Variations



# Documentation



# Documentation of Visual Assessment

- Discharge points
- Storm event information
  - (get a rain gauge)
  - Length (Hours)
  - Amount of precipitation (inches)
  - Duration of time since previous event or snow melt discharge
  - Date and time discharge began



- Weather Underground:  
[www.wunderground.com](http://www.wunderground.com)  
[www.wunderground.com/history](http://www.wunderground.com/history)
- National Weather Service:  
[www.weather.gov](http://www.weather.gov)





# Description of the discharge

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
WATER RESOURCES DIVISION  
**INDUSTRIAL STORM WATER PROGRAM**  
*Quarterly Visual Assessment  
Report Form*

The intent of this compliance assistance document is to provide a Visual Assessment Report Form that **permittees** can use to meet the conditions of the National Pollutant Discharge Elimination System (NPDES) Wastewater Discharge General Permit for Industrial Storm Water Discharges or NPDES Individual Permits. This document and other compliance assistance documents can be found at the DEQ, WRD Industrial Storm Water website [www.mi.gov/deqstormwater](http://www.mi.gov/deqstormwater) (then click on INDUSTRIAL PROGRAM).

<b>Facility Information</b>		
Designated Name:		Certificate of Coverage No. <i>or</i> Individual Permit No:
<b>Visual Assessment Information</b>		
Discharge Point#/Name:		Substantially Identical Outfall? <input type="checkbox"/> No <input type="checkbox"/> Yes <small>List substantially identical outfalls</small>
Name(s)/Title(s) collecting sample:		Name(s)/Title(s) examining sample:
Certified Operator? <input type="checkbox"/> Yes <input type="checkbox"/> No		Certified Operator? <input type="checkbox"/> Yes <input type="checkbox"/> No
Date & Time Discharge Began: <small>Enter date &amp; time</small>	Date & Time Sample Collected*: <small>Enter date &amp; time</small>	Date & Time Sample Examined: <small>Enter date &amp; time</small>
If sample was collected > 30 minutes from start of discharge, provide explanation:		
Substitute Sample? <input type="checkbox"/> Yes <input type="checkbox"/> No <small>Identify quarter/year when sample was originally scheduled to be collected</small>		
Nature of Discharge: <input type="checkbox"/> Rainfall <input type="checkbox"/> Snowmelt		
If Rainfall: Rainfall Amount in inches:		Previous Storm Ended > 72 hours Before Start of This Storm? <input type="checkbox"/> No <input type="checkbox"/> Yes
<b>Observations:</b>		
Color: <input type="checkbox"/> None <input type="checkbox"/> Other (describe)		Turbidity: <input type="checkbox"/> No <input type="checkbox"/> Yes
Oil Films/Sheens: <input type="checkbox"/> None <input type="checkbox"/> Flecks <input type="checkbox"/> Globs <input type="checkbox"/> Sheen <input type="checkbox"/> Slick <input type="checkbox"/> Other (describe)		Floating Solids: <input type="checkbox"/> No <input type="checkbox"/> Yes (describe)
Foam (gently shake sample): <input type="checkbox"/> No <input type="checkbox"/> Yes		Suspended Solids: <input type="checkbox"/> No <input type="checkbox"/> Yes (describe)
<b>Settleable Solids</b> (Observe for settled solids after allowing the sample to sit for approximately one-half hour): <input type="checkbox"/> Yes <input type="checkbox"/> No		
Odor: <input type="checkbox"/> None <input type="checkbox"/> Musty <input type="checkbox"/> Sewage <input type="checkbox"/> Sulfur <input type="checkbox"/> Sour <input type="checkbox"/> Other (describe)		
Clarity: <input type="checkbox"/> Clear <input type="checkbox"/> Slightly Cloudy <input type="checkbox"/> Cloudy <input type="checkbox"/> Opaque <input type="checkbox"/> Other (describe)		
Other Obvious Indicators of Storm Water Pollution: <input type="checkbox"/> No <input type="checkbox"/> Yes (describe)		
Pictures Taken: <input type="checkbox"/> No <input type="checkbox"/> Yes (Required for documentation)		
<b>Follow-up:</b>		
Potential sources of observed storm water contamination: Insert details		
Corrective Action Taken? <input type="checkbox"/> N/A <input type="checkbox"/> No <input type="checkbox"/> Yes Insert details		

\*In accordance with permit requirements, samples are to be collected within the first 30 minutes of the start of a discharge. If it is not possible to collect the sample within the first 30 minutes, the sample shall be collected as soon thereafter as practical but not exceeding 60 minutes. For snowmelt, samples shall be collected during a period with measurable discharge from the site.

# Observing the sample (Assessment)

- By Certified Operator
  - After collection
  - Within 48 hours of a collection
- Appropriately mixed/shaken

# Documentation

- Sample collection
  - Discharge Point
  - Date of discharge
  - Time
    - Collection
    - Beginning of discharge
  - Collector



# Slide Label

**Date:** \_\_\_\_\_

**Time:** \_\_\_\_\_

**Discharge Pt.:** \_\_\_\_\_

**Date/Time of Start of Discharge:**

**Facility:** \_\_\_\_\_

\_\_\_\_\_

**Personnel:** \_\_\_\_\_



# Documentation

- Collector
- Assessment
  - Certified Operator
  - Name
  - Title
  - Operator Certification Number

# Documentation

- Nature of Discharge  
(Rain or snowmelt)



# Documentation

- Probable source of contamination

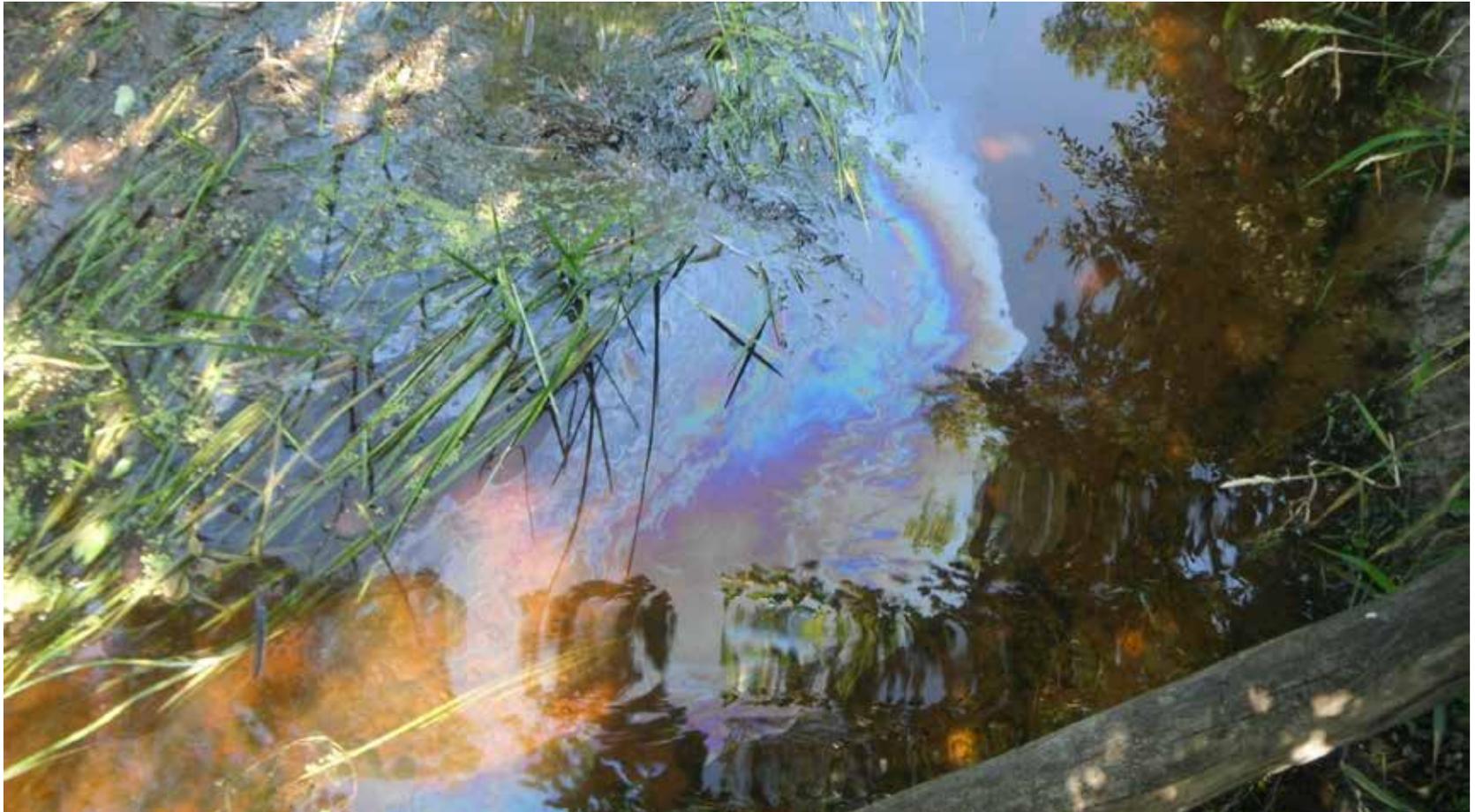


# Take Action



# Documentation

- Any unnatural characteristics of the discharge shall be reported







# Documentation

- Photographic evidence
  - Photo taken of the sample against a white background
  - Colored photo or
  - Electronic file



# Documentation

- Explanation why sample was not taken during the first 30 minutes of the storm event



# Summary

- Be Prepared
- Provide appropriate training and supervise the collection of the sample



# Summary

- Document the characteristics of the discharge at the time of the discharge
- Certified Operator must visually assess the sample collected
- Document the visual assessment
  - Photograph
  - Written report
- Make corrective actions in a timely manner

# Assistance

- [www.michigan.gov/deqstormwater](http://www.michigan.gov/deqstormwater)
- Contact Industrial Storm Water Staff
- Compliance assistance
- FAQ sheet

# Staff Contacts

The screenshot shows the Michigan Department of Environmental Quality (DEQ) website. The main navigation bar includes links for Michigan.gov Home, DEQ, Online Services, Permits, Programs, Site Map, Contacts, and Locations. A search bar is located on the right. The left sidebar contains a list of categories such as Water, Surface Water, Storm Water, and Air. The main content area is titled "Industrial Program" and contains the following text:

**Industrial Program**

As a result of the federal regulations governing storm water discharges, the State of Michigan began issuing permit coverage in 1994. There are three types of permits available in Michigan: a general permit, a general permit with monitoring requirements, or a site specific individual permit. There are approximately 4,000 facilities with storm water discharge authorization.

Michigan's industrial storm water permit authorization requires facilities to obtain an industrial storm water certified operator who has supervision over the storm water treatment and control measures at the facility. In addition the facility must develop a Storm Water Pollution Prevention Plan (SWPPP) which describes nonstructural and structural controls implemented onsite and eliminate any unauthorized non-storm water discharges. The certification process for industrial storm water certified operators is currently an on going process in each of the district offices.

[Industrial Storm Water Program Staff Contact Information](#)

**Storm Water Program General Permits**

Once it has been determined that an industrial storm water permit is required, please review the appropriate general permit below. General permits are associated with a cycle year and the watershed that receives the storm water discharge. General permits are reissued every 5 years.

- [Watershed Cycle Year Map](#)
- [Industrial Storm Water General Permits](#)
- [Industrial Storm Water Permits on Public Notice](#)

**Storm Water Program Compliance Assistance**

The following compliance assistance documents and web links are intended to help facilities better understand the storm water program regulations.

- [Determining if a facility is required to obtain a permit \(NEW FACILITIES\)](#)
- [Determining if a facility is required to obtain a permit \(EXISTING FACILITIES\)](#)
- [Federally Regulated Standard Industrial Classification \(SIC\) Code List](#)
- [North American Industry Classification System \(NAICS\) Website](#)
- [\(NAICS / SIC code\) Frequently asked questions](#)
- [EPA - Industrial Storm Water Fact Sheet Series](#)

**Related Content**

- MS4 Implementation Team
- Summary of NPDES Fees for storm water discharges [PDF](#)
- Municipal Program / MS4 Compliance Assistance
- Storm Water Staff Contact Information
- Construction Site Program

# Goal Clean Discharges



Questions?

