Stormwater Coalition of Albany County

Storm System and Outfall Mapping

What Is an MS4 Outfall?

Analysis & Diagrams

Questions, Answers, and Guidance

(~2015 to 2018)

This is a compilation of questions and answers used by the Stormwater Coalition to guide how best to determine if a stormwater structure is or is not an "MS4" outfall. This is sometimes difficult to determine when field mapping. It is not a formal regulatory document, but instead a practical, go to compilation of previously scattered emails and diagrams used by Coalition staff and member communities over the years. Compiled June, 2021.

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Stormwater Coalition of Albany County
BMP 3-1: Map Outfalls
Three Scenarios: What should be mapped as an outfall?
Including response from NYS DEC, Region 4, Mary Barrie – January 29, 2015

Outfalls are generally described as the end of a conveyance system which either drains to a waterbody of the United States directly, via overland flow (which eventually leads to the waterbody), or to an adjacent regulated MS4. Recently, there has been an influx of outfall mapping and ORI; more questions have come up regarding what to consider an outfall.

1. Sometimes it is easier for a MS4 to use a structure up drainage from the outfall to test as the actual outfall is inaccessible for some reason. Should the actual outfall be mapped as the regulated outfall or should the structure being tested, up drainage, be mapped as the outfall?
    a. ***Figure 1:*** An intermunicipal catch basin was difficult to access and sample (B). The catch basin up drainage was more accessible (A). No other infrastructure tied into the system past the up drainage catch basin.
    b. ***Recommendation:*** Mapping the catch basin which is the actual outfall (B) is a better idea because outfalls are associated with municipal ownership. However, sampling and testing should be done where accessible (A) and note what that is a stormwater structure up-drainage from the outfall.
    c. ***NYS DEC Recommendation:*** Agree with the Stormwater Coalition recommendation. B should be mapped as the regulated outfall, but A can be used as the sampling site.

2. Especially in more rural areas, piped infrastructure leads to vegetated, sometimes natural, ditches. In the past, the outfall has been mapped at the end of the infrastructure as the water leaving the system at this point would travel 'overland' to the receiving waterbody. According to the NYSDEC Guide to IDDE, ditches leading to a receiving water (it does not differentiate between a ditch alone collecting runoff and a ditch following a section of infrastructure) are also outfalls. Is the outfall the end of the ditch or the end of the infrastructure?
    a. ***Figure 2:*** Two ends of infrastructure points lead to separate ditches which eventually join (A and B). The combined ditch then leads to the receiving waterbody (C).
    b. ***Recommendation:*** Using the ends of both pipes (A and B) as outfalls is more functional because those are locations that would more likely be checked by municipal staff. Also, the drainage ditch is serving as a sort of green infrastructure and stormwater runoff would potentially infiltrate.
    c. ***NYS DEC Recommendation:*** Under the assumption that the ditches are carrying a concentrated flow of stormwater runoff, C is the regulated outfall so it should be mapped and sampled appropriately. However, if there are safety concerns and outfall C is truly inaccessible, map the up drainage outfalls (A & B) and document your decision.

3. Streams are frequently flowing under bridges. Usually, outfalls are found next to bridges (if there is an outfall). However, sometimes, the bridges themselves will have structures imbedded in them that go straight down into the receiving water. There is no way to sample as the structures open up into the culvert. Are these structures all considered outfalls? Would the downstream end of the culvert conveying the receiving water be considered an outfall?
    a. ***Figure 3:*** There was a bridge which has four 6" PVC pipes (A and B) going directly from the surface of the road into the culvert with the stream below. The stream will convey all of the stormwater from the road downstream (C).
    b. ***Recommendation:*** The pipes (and sometimes catch basins) in the bridge do not capture any water so there would never be any water to sample (A and B). Using the downstream end of the culvert (C) makes more sense, however there will always be water running through a culvert with a stream so the sample would be from the entire drainage area up to this point. Not sure what to do in this situation or if these outfalls should be removed from the inventory as there is no potential for cross connection. Also, the pipes (or catch basins) in the bridges are functioning more as under drains than as structures that hold stormwater runoff. What is the protocol for DOT?
    c. ***NYS DEC Recommendation:*** There are no regulated outfalls in this scenario. The structures in the bridge are not carrying concentrated flow (just sheet flow) and there is no real way to sample each of these structures as they discharge into the culvert below.

Figure 1.

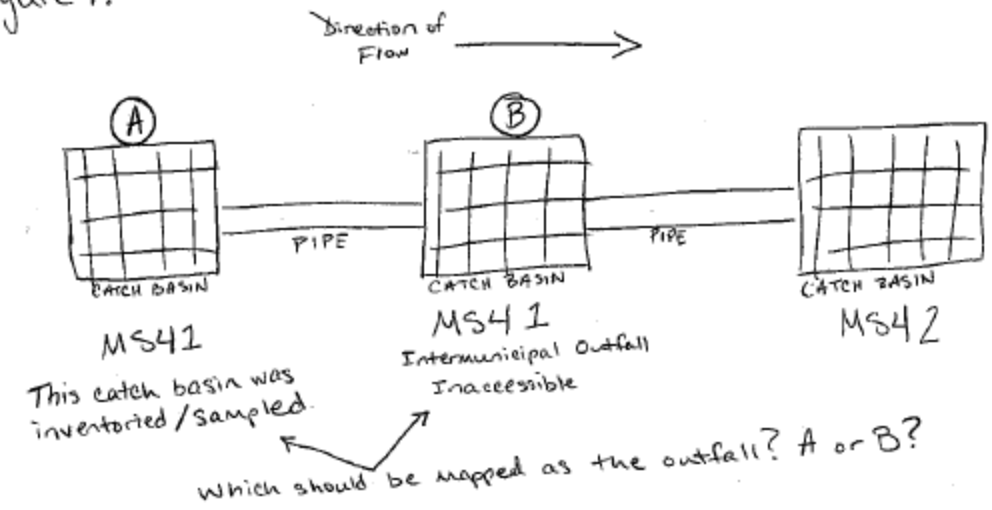
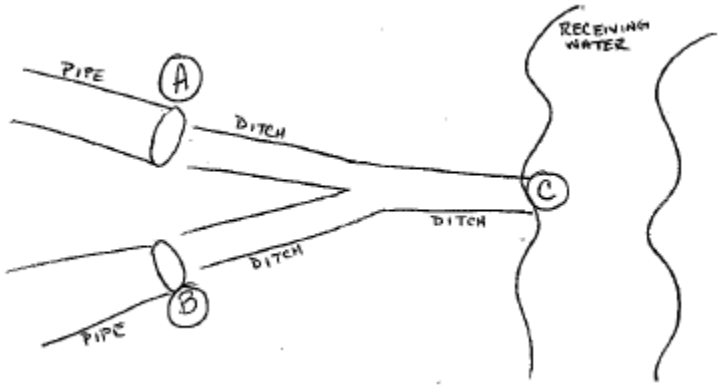
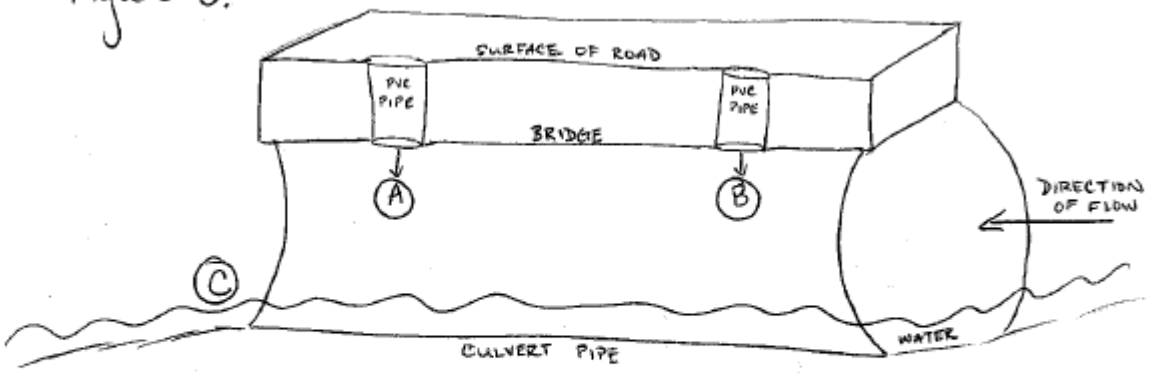


Figure 2.



Where is/are the outfall/s?
A and B?
C?
All three?

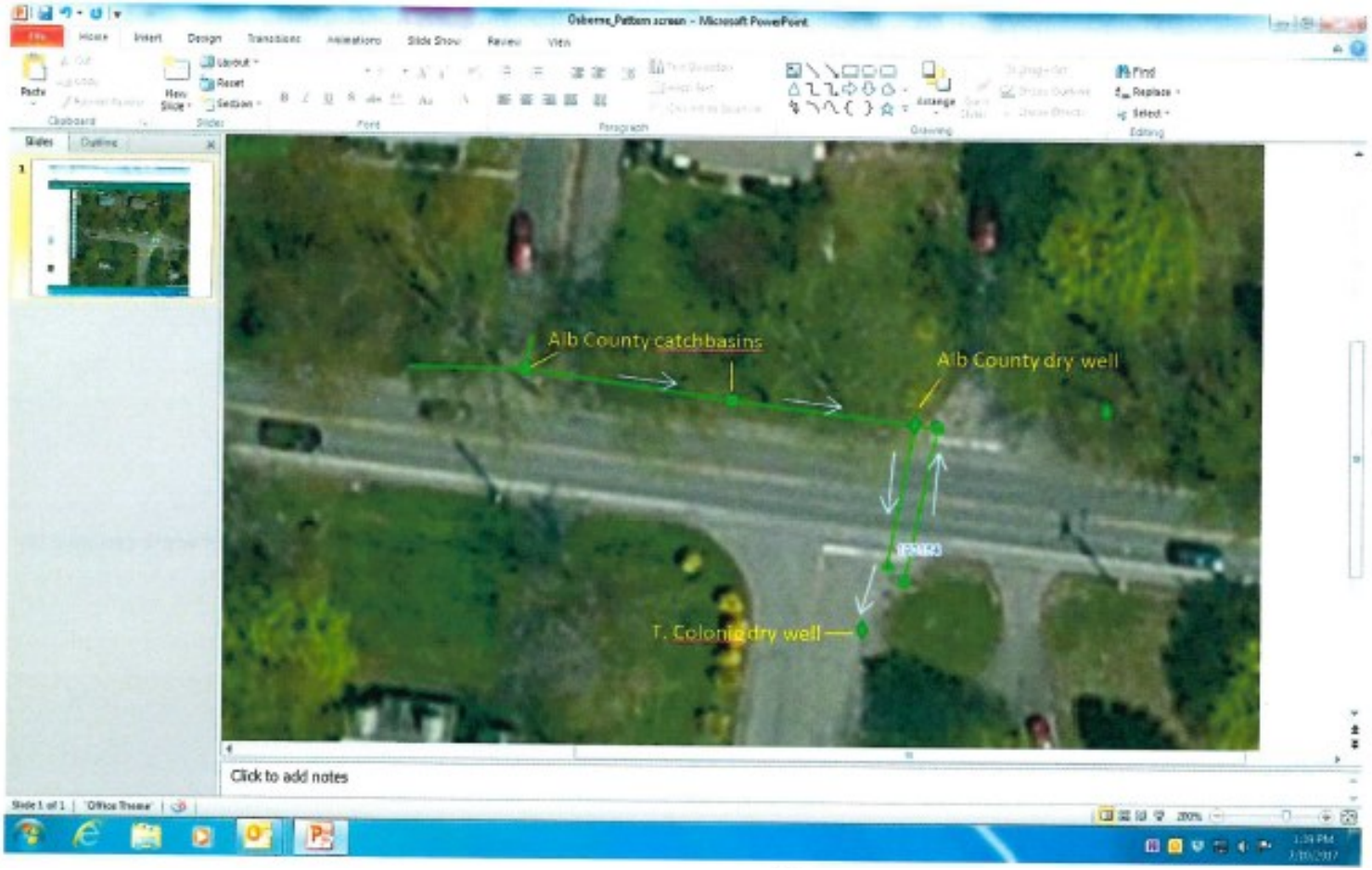
Figure 3.



Where is/are the outfall/s? Are any of these outfalls?
A and B?
C?
All three?

July 11, 2017 QUESTION FOR NYSDEC REGION 4

This is a screen capture image (from the Stormwater Coalition GIS webmapper) of a situation in which I am trying to determine if we have a true regulatory stormwater outfall (190154). The system consists of Albany County catchbasins on Osborne Road that ultimately drain to a dry well, which is believed to have an emergency overflow outlet that apparently is directed to a Town of Colonie structure on Patten Drive that I also believe to be a dry well. Second image is a zoomed out version with the Town infrastructure added for comparison. I looked at this in the field and the mapping appears to be correct as best as I can tell. The question I would pose is, given the fact that there is apparently no direct discharge to surface waters from either jurisdiction's system (but rather to groundwater via dry wells), is this still an outfall? In other words, does the mere existence of an intermunicipal connection make it an outfall regardless of the ultimate fate of the flow? There are probably a number of comparable situations to this throughout the area, especially in Colonie and Guilderland. Thank you,



July 11, 2017 RESPONSE FROM NYSDEC REGION 4

If it's not hitting a surface water, which can be a wetland, then it's not an outfall. Sounds like it the dry wells are just to capture excess runoff which can then be infiltrated to groundwater.

Stormwater Coalition of Albany County
BMP 3-1: Map Outfalls
Outfall Questions: What should be mapped as an outfall?
Including determinations from NYS DEC, Region 4, Mary Barrie – April 25, 2017

Recently, there has been an influx of outfall mapping reconciliation and ORI; more questions have come up regarding what to consider an outfall.

Overall interpretations of what is/is not an outfall should follow these ideas:

- **Outfall** - is defined as any point where a municipally owned and operated separate storm sewer system discharges to either surface waters of the State or to another MS4. Outfalls include discharges from pipes, ditches, swales, and other points of concentrated flow. However, areas of non-concentrated (sheet) flow which drain to surface waters of the State or to another MS4's system are not considered outfalls and should not be identified as such on the system map.
- Outfalls serve as locations from stormwater infrastructure to detect illicit discharges.
- ORI inspections are not conducted on streams-just stormwater discharge locations.

1. Previously, the Coalition supplied the following scenario:
   Streams are frequently flowing under bridges. Usually, outfalls are found next to bridges (if there is an outfall). However, sometimes, the bridges themselves will have structures imbedded in them that go straight down into the receiving water. There is no way to sample as the structures open up into the culvert. Are these structures all considered outfalls? Would the downstream end of the culvert conveying the receiving water be considered an outfall?
   a. ***Figure 1a:*** There was a bridge which has four 6" PVC pipes (A and B) going directly from the surface of the road into the culvert with the stream below. The stream will convey all of the stormwater from the road downstream (C).
   b. ***NYS DEC Determination:*** There are no regulated outfalls in this scenario. The structures in the bridge are not carrying concentrated flow (just sheet flow) and there is no real way to sample each of these structures as they discharge into the culvert below.

   For clarification, the Coalition would now like to pose this scenario:
   a. ***Figure 1b:*** There was a bridge which has two catch basins (A and B) going directly from the surface of the road into the culvert with the stream below. The stream will convey all of the stormwater from the road downstream (C).
   b. ***Another variation:*** There are also similar situations in which a stream is piped underground, similar to a culvert, but under roads or parking lots, and there are catch basins from the surface going directly into the piped stream below. Would every catch basin be an outfall? None?
   c. ***SWC Recommendation:*** Per the previous NYS DEC recommendation, there are no regulated outfalls in this scenario. The structures in the bridge are not carrying concentrated flow (just sheet flow) and there is no real way to sample each of these structures as they discharge into the culvert below.
   d. ***NYS DEC Determination:*** There are no regulated outfalls in this scenario. The catch basins (A and B) in the bridge are not carrying concentrated flow (just sheet flow) and there is no real way to sample each of these structures as they discharge into the culvert below. Remember, outfalls are a way to sample the discharge, you are not sampling the stream (C).

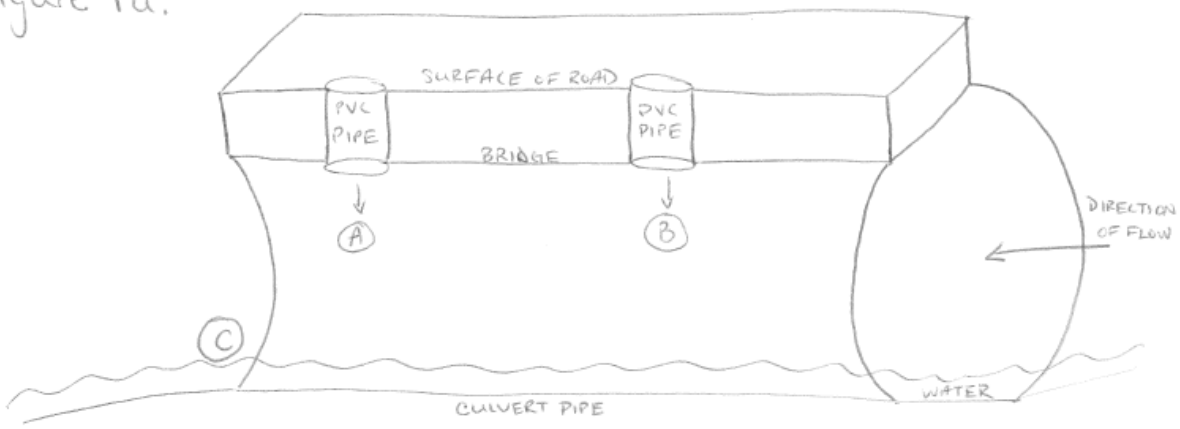
2. There are many times when ditches on the sides of the roads convey stormwater runoff to waterbodies. The ends of these ditches are regulatory outfalls. When the sides of the roads do not convey a concentrated flow of stormwater, they are not included in the outfall inventory (i.e. the side of the road is only serving as the side of the road). Likewise, bridges are sometimes reinforced with rip rap on the sides which can direct flow to waterbodies. The confusion occurs when trying to determine when the reinforcement on the sides of the bridges are considered regulated outfalls.
   a. ***Figure 2:*** Concentrated stormwater runoff is entering a waterbody via a roadside ditch (A1). There is a bridge reinforced with rip rap. There are up to 4 possible outfalls created due to the location of the rip rap (A2, B, C, and D).
   b. ***Question:*** Aside from the outfall due to the roadside runoff, are the locations where the rip rap reinforces the bridge also considered regulatory outfalls?

c. ***NYS DEC Determination:*** The only regulated outfall is at the end of the ditch (A) because it is carrying concentrated flow. Rip rap along the sides of bridges (A2, B, C, and D) are not outfalls unless they have a designated chute. These locations would be sampled during a dry weather event, so rip rap along a bridge/road to a stream would never be flowing. However, if concentrated flow discharged to the rip rap which lead to the stream, that would be considered an outfall.

3. There is a double culvert pipe coming from a pond and connecting to the rest of the stream under a road. From the same pond, there is an overflow device in the pond that also discharges to the stream. The overflow device has a grate (debris catcher) on it and is set higher on the wall of the pond.
    a. ***Figure 3***: In the figure below, there are 2 outfalls named at the end of pipe for the overflow device, 130007 and 130008. One mistakenly names one of the culvert pipes as an outfall. And, the other references the end of the pipe for the overflow device (it sits ~4' above the surface of the pond in dry weather conditions).
    b. ***Question***: Is the pipe for the overflow device considered an outfall since it works similarly to the culvert pipes?
    c. ***NYS DEC Determination:*** The pipe coming from the overflow device (A) is not considered an outfall because it is functioning as a culvert pipe for the stream/pond. The pond is not a post construction stormwater management practice and there are other outfalls discharging to the stream that are sampled.

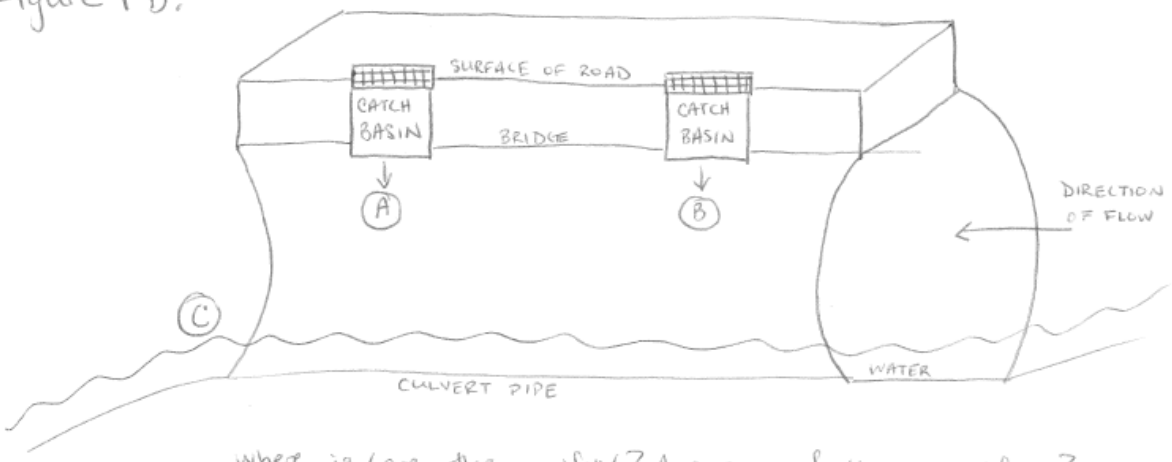
4. There are multiple ends of pipe going into a forested/wet area. This forested/wet area then drains back into the stormwater conveyance system before reaching its final outlet to another regulated MS4/surface water.
    a. ***Figure 4***: There are 3 drainage areas going to the forested/wet area (A, B, and, C). Ultimately, water from the forest/wet area will be picked up later and discharged to a stream (D).
    b. ***SWC source of confusion***: Although it seems like, from a regulatory perspective, the last discharge location (D) should be used as the outfall because everything drains to that location, some of the wooded areas we come across are very large and it does not seem like pollutants discharging to the forested/wet areas from the stormwater infrastructure (i.e. oil) would ever be detected at the final discharge to a stream. However, we understand that this 'green space' is functioning as a way for stormwater to infiltrate.
    c. ***Question***: Are each of the locations that discharge to the forest/wet area considered outfalls (A, B, and C) or is just the last discharge tot the stream considered an outfall (D)?
    d. ***NYS DEC Determination:*** Wetlands/consistently wet areas are considered hydrologically connected to local streams. Therefore, stormwater discharges to these locations (A, B, and C) as well as the ultimate discharge to the stream (D) should be considered outfalls. Similarly, discharges to larger wooded areas (A, B, and C) are considered outfalls because someone sampling only at the stream (D) would never detect any illicit discharges (i.e. oil, paint, dog poop bags) because the pollutants would not travel that far.

Figure 1a.



Where is/are the outfall/s? Are any of these outfalls?
A+B?
C?
All three?

Figure 1b.



where is/are the outfall/s? Are any of these outfalls?
A+B?
C?
All three?

Figure 2.

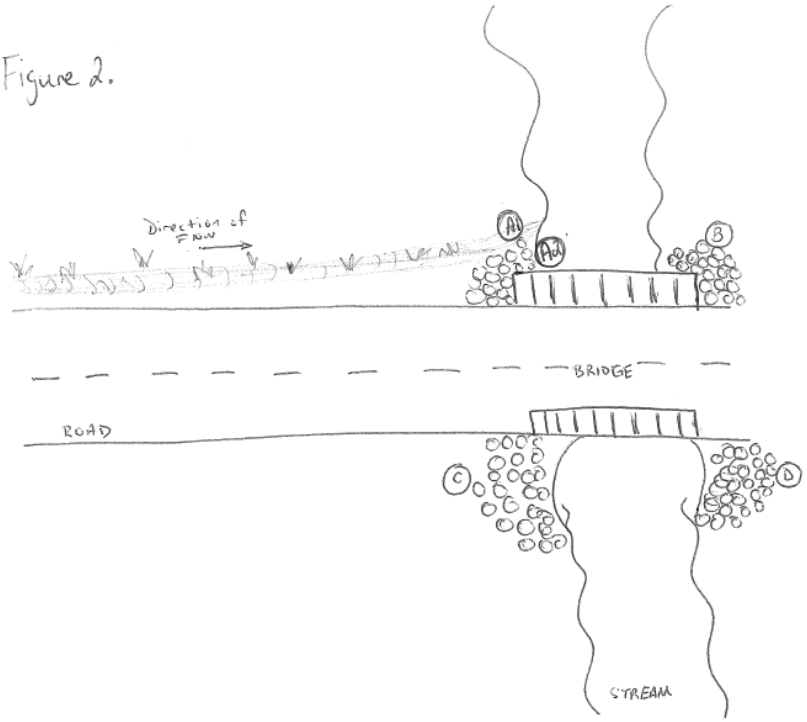


Figure 3.

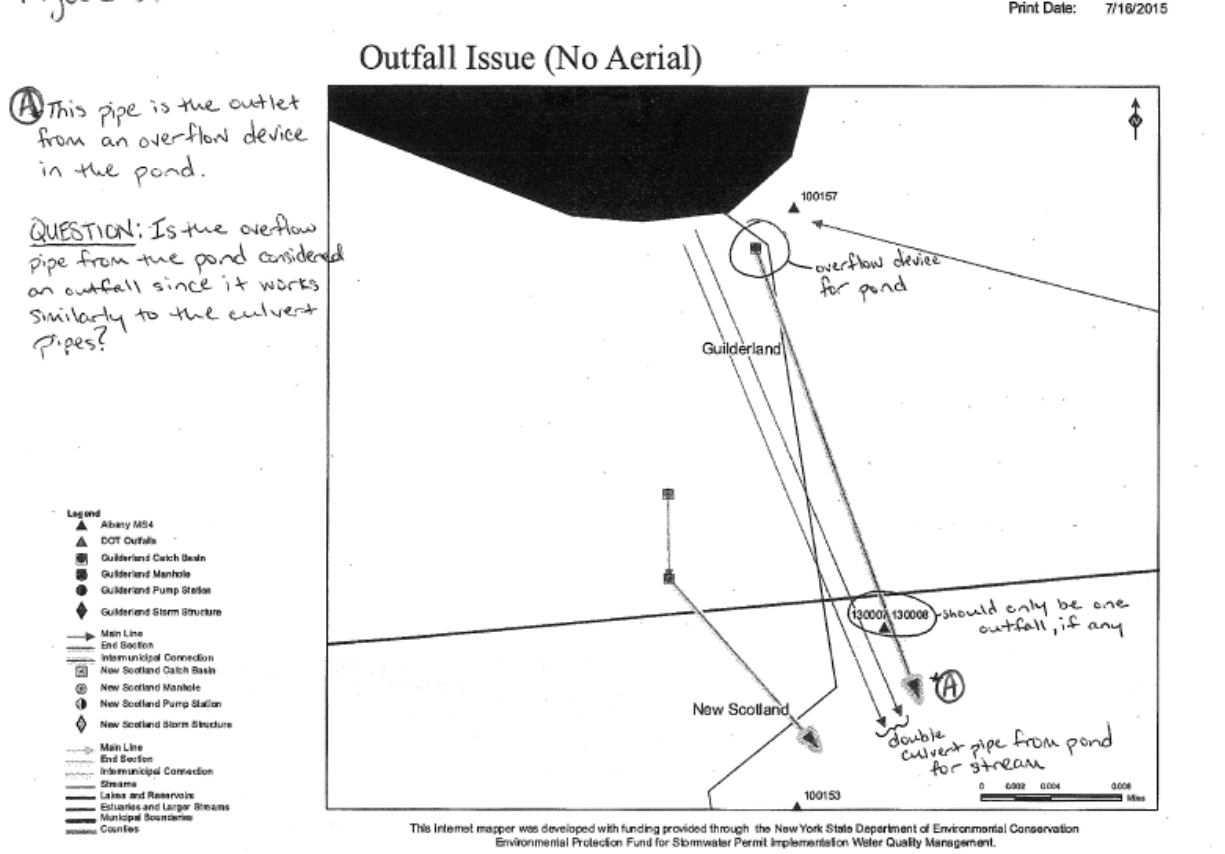
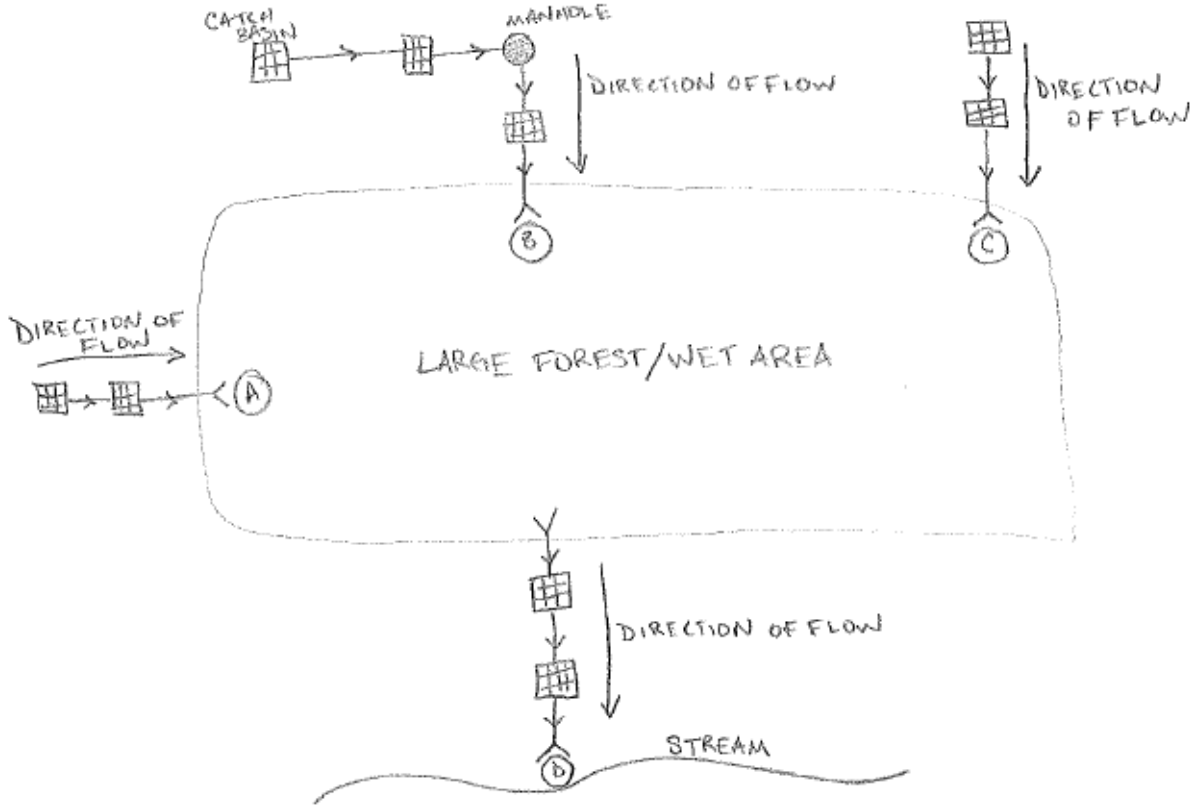
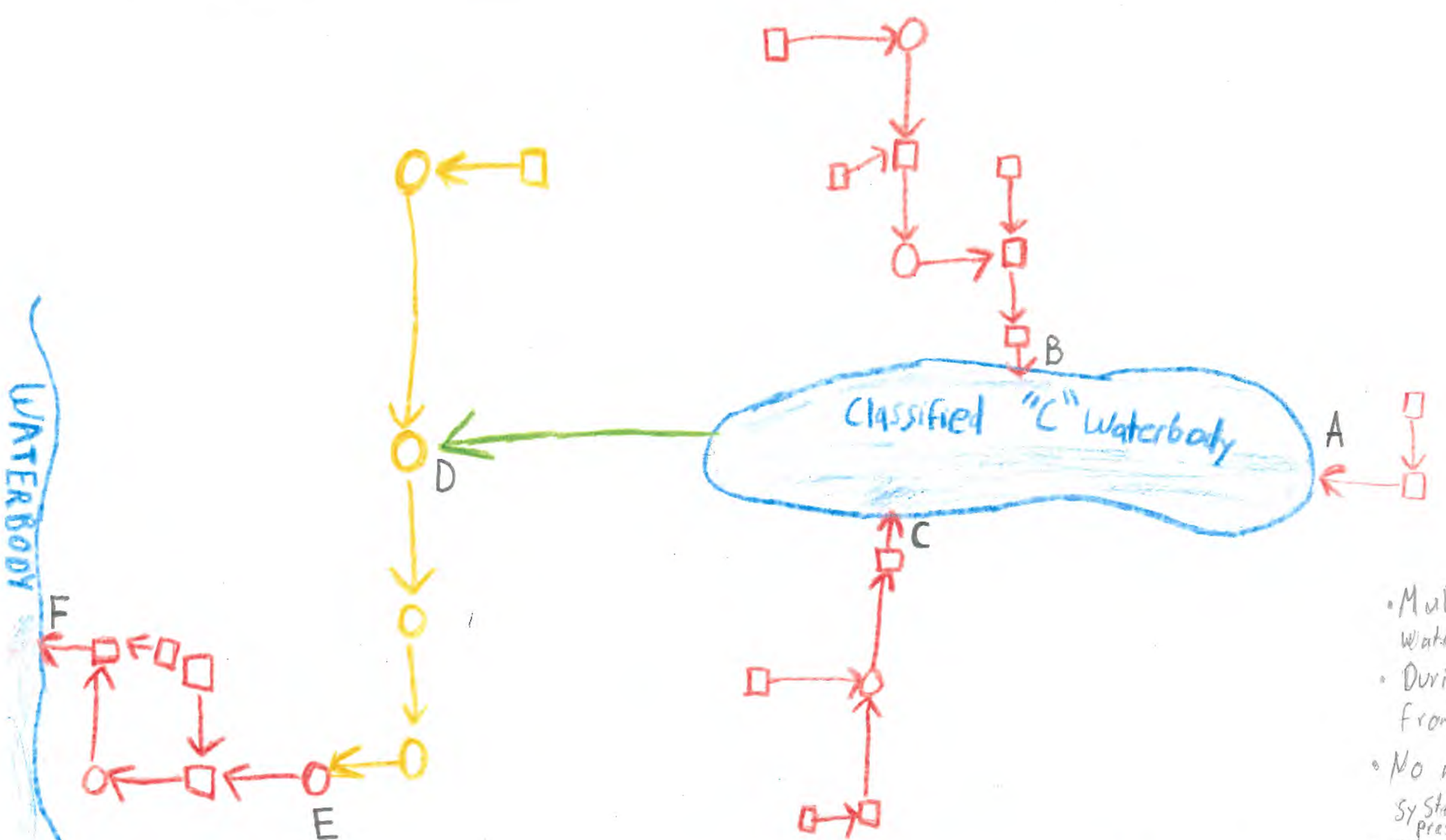


Figure 4.


CATCH BASIN
MANHOLE
DIRECTION OF FLOW
DIRECTION OF FLOW
DIRECTION OF FLOW
LARGE FOREST/WET AREA
DIRECTION OF FLOW
STREAM
A
B
C
D

Prepared by J. Flagler SW Coalition 8/14/18 for DEC Region 4	Scenario 1 Question for M. Bassa	Pressurized Line owned by MS4 A discharges from a Classified Waterbody to MS4 B



Municipality A
- □ - Catch Basin
- O - Manhole
- Δ - MS4 Outfall
- → - Gravity Line with flow direction
- → Pressurized Line

Municipality B
- □ - catch Basin
- O - Manhole
- → - Gravity Main

DEC Region 4 Answer 8/15/2018

A, B, C, D, and F are MS4 Municipality A Outfalls

E is MS4 Municipality B Outfall

Scenario 1 QUESTION ⟹

- Multiple Separate Storm systems drain into Water of the US
- During large precipitation events water is pumped From the Waterbody to another MS4's infrastructure
- No more stormwater is added to the conveyance system from Municipality A after the manhole where the pressurized line enters
- The system ties back into the original MS4's infrastructure and drains into another water of the US

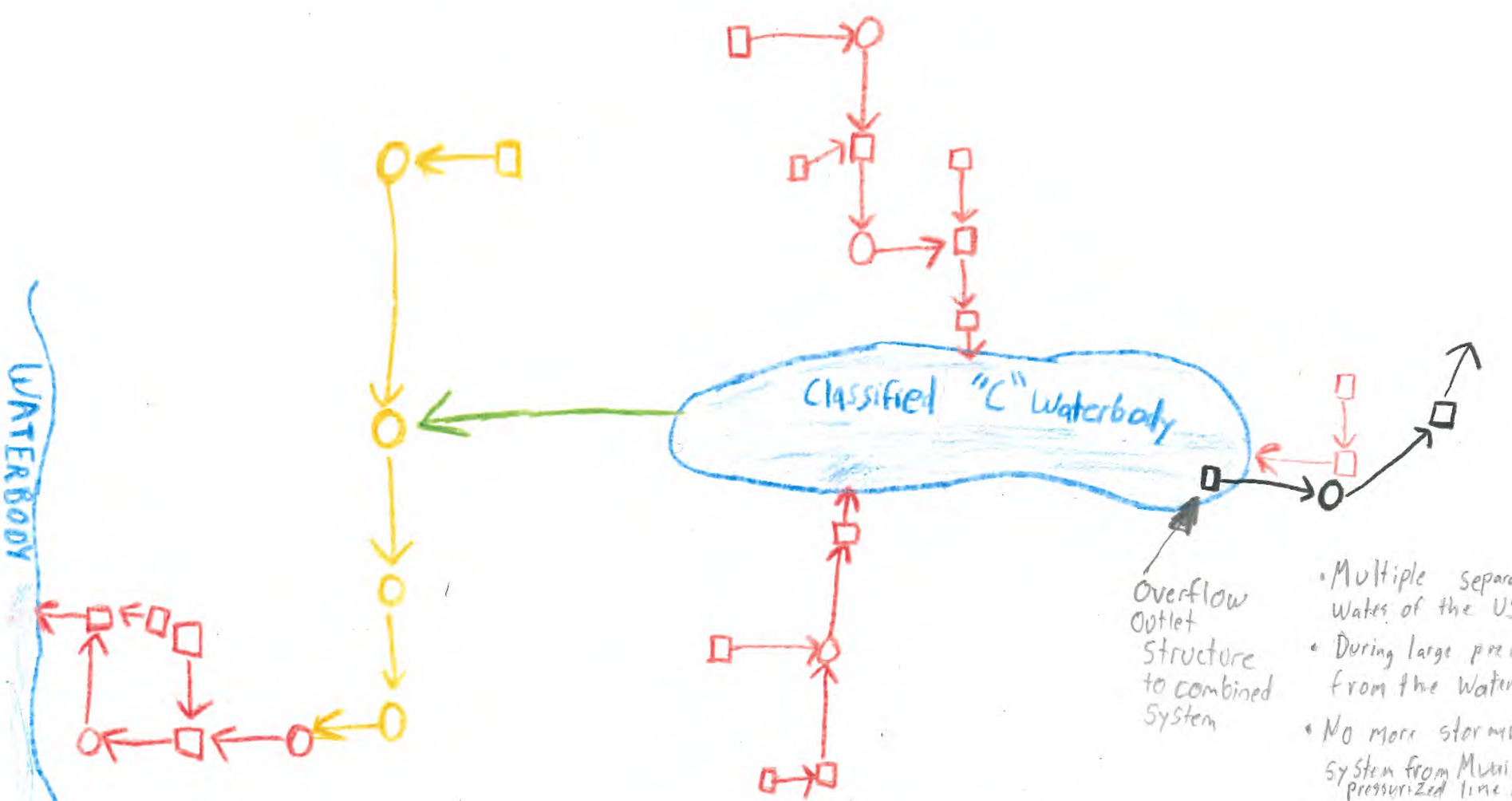
- Points A - F are locations of potential outfalls. Which of these points are MS4 outfalls and which municipality do they belong to?

Prepared by J Flegler SW Coalition 8/14/18 for DEC Region 4

Scenario 2

questions for M. Bauce

Modification of Pressurized Line Scenario — the Classified waterbody has an overflow structure which discharges to Combined system



Municipality A

□ - Catch Basin
○ - Manhole
Δ - MS4 Outfall
→ - Gravity Line with flow direction
→ Pressurized Line

Municipality B

□ - catch Basin
○ - Manhole
→ - Gravity Main

Combined Infrastructure

□ - Catch Basin
○ - Manhole
→ - Gravity Main

- Multiple separate storm systems drain into Wates of the US
- During large precipitation events water is pumped from the waterbody to another MS4's infrastructure
- No more stormwater is added to the conveyance system from Municipality A after the manhole where the pressurized line enters
- The system ties back into the original MS4's infrastructure and drains into another water of the US
- Overflow structure for waterbody drains to Combined system as well. Does this change outfall locations, etc.?

DEC/Region 4 Answer 8/15/2018

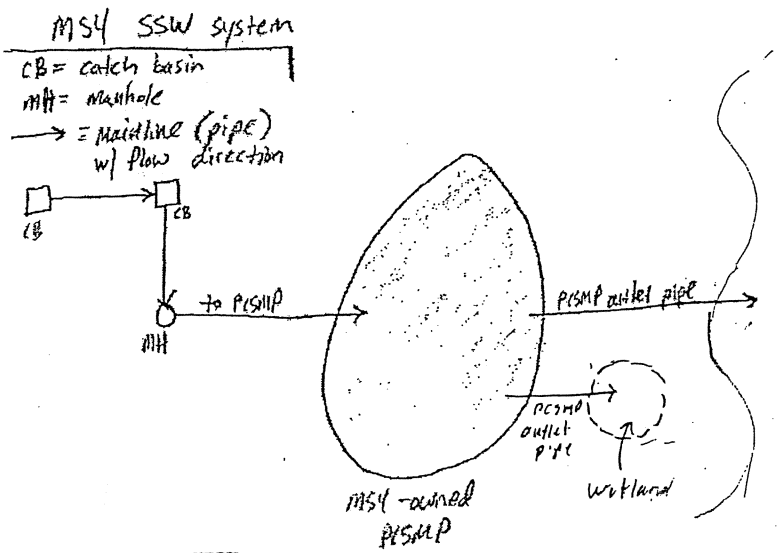
No, the MS4 municipal outfalls remain the same.

The purpose of outfall mapping of ORI is to track pollutants to classified waters

Scenario 2 Question ⇒

Scenario 4 from 9/11/2017 Coalition Query originally

Q: For MS4 owned PCSMPs, should there be an MS4 outfall at end-of-pipe?

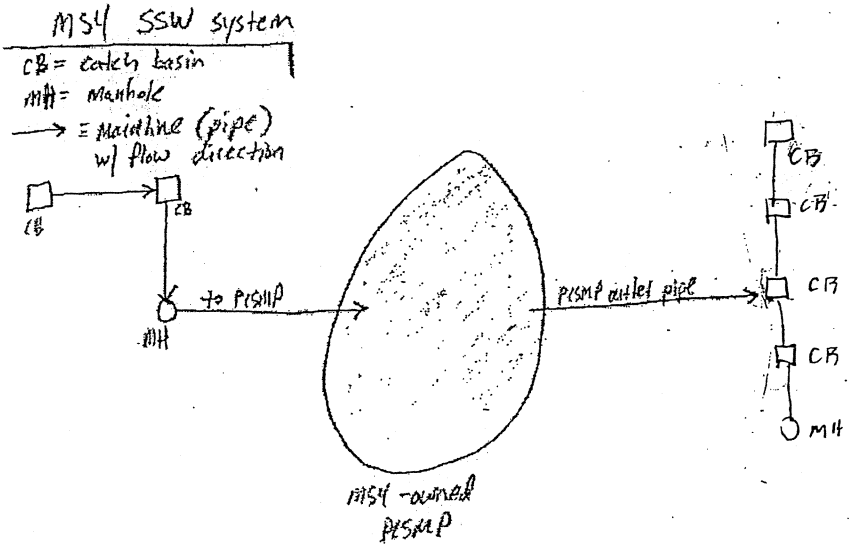


Scenario 1

A: If discharges to stream or wetland?

YES

DEC Region 4 6/2018

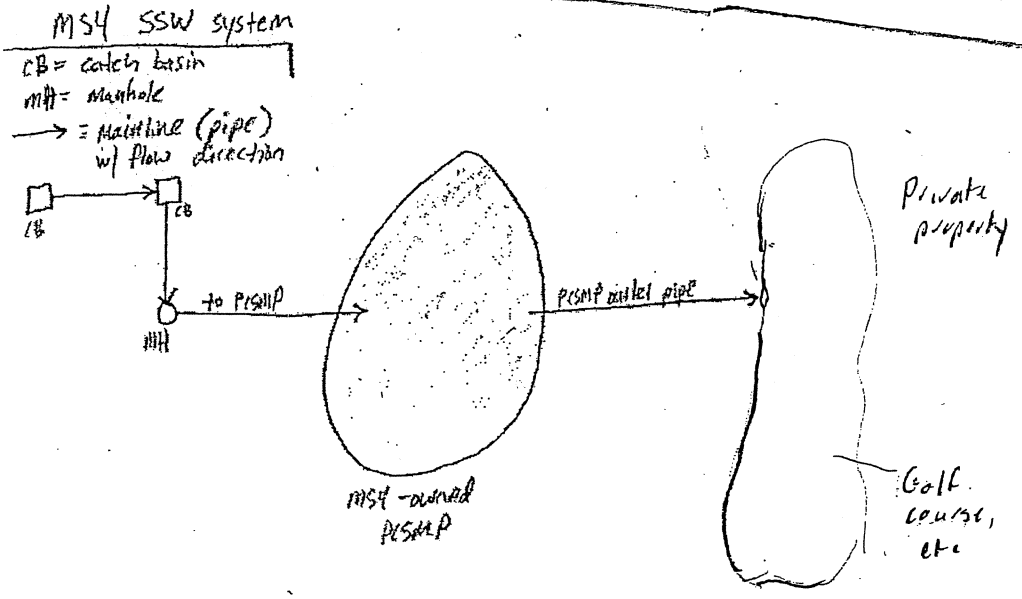


Scenario 2

A: If discharges to another regulated MS4?

YES

DEC Region 4 6/2018



Scenario 3

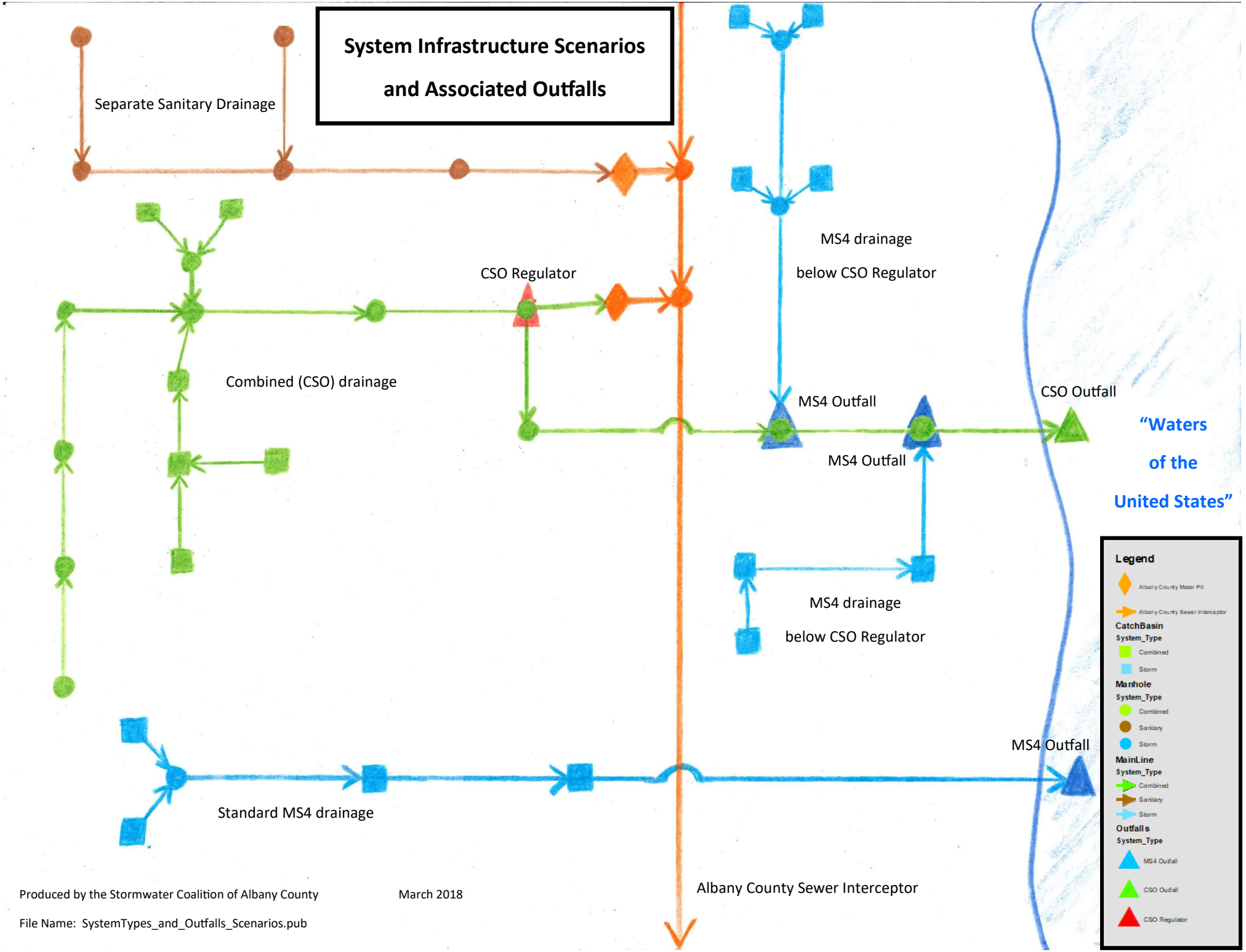
A: If discharges to private property? (ex. golf course)

NO

DEC Region 4 6/2018

Questions for M. Barrie DEC Region 4 | Answers: June 20, 2018

System Infrastructure Scenarios and Associated Outfalls



Produced by the Stormwater Coalition of Albany County March 2018

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