



Instructions and Background Outfall Inventory and Prioritization Tool

Version 2

March 21, 2019

Change Log

Final V1: Original version of the instructions and the tool, now deprecated.

Final V2: Major reorganization of instructions document to correspond with IDDE Plan procedures as outlined in NSP IDDE SWMP. Changes were too extensive to be tracked using track changes. Important modifications were also made to the tool itself, though these were less extensive than changes to the instructions.

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Introduction

The 2016 Final Massachusetts Small MS4 General Permit requires that permittees undertake five major tasks for Illicit Discharge Detection and Elimination (IDDE):

- 1) Initial ranking of outfalls and interconnections
- 2) Dry weather outfall and interconnection screening
- 3) Follow up ranking of outfalls and interconnections
- 4) Dry weather catchment investigation
- 5) Wet weather outfall screening and catchment investigation (only if applicable)

The Neponset Stormwater Partnership (NSP) Model IDDE Program Document and Stormwater Management Program (the model IDDE SWMP) provides a detailed description of the steps and tasks involved in the IDDE process. If you have not done so already, we recommend that you review that document to familiarize yourself with the steps and tasks involved.

The Neponset Stormwater Partnership (NSP) IDDE Outfall Inventory and Prioritization Tool (“the Outfall Tool” or “the Tool”) is intended to help communities plan, document, and report on their IDDE work at various key stages by providing a framework for ranking and tracking outfalls and their associated catchments.

This document provides instructions for using the Outfall Tool. A brief description of each field in the Outfall Tool is included at the end of the document.

The NSP Outfall Tool is distributed as an unlocked MS Excel spreadsheet. While we describe our suggested approach to using the Outfall Tool below, communities are welcome to modify the Tool in any way they see fit to adapt it to their own approach.

Credits

The NSP Outfall Tool was developed through a cooperative effort by the Neponset River Watershed Association (NepRWA) and the Metropolitan Area Planning Council (MAPC) using funds provided by NSP member communities as well as MetroFuture Technical Assistance Grant Funds from the MAPC.

Prerequisites and Technical Support

In order to use the NSP Outfall Tool, several prerequisites need to be in place:

- The catchment area associated with each of your drain outfalls needs to be delineated. For most members of the NSP, this work has already been completed using the MAPC catchment delineation methodology. Your initial catchment delineation does not need to be perfect. You can update and refine it as you complete your catchment investigation work.
- Key attributes about land uses in your catchments should be extracted from available GIS data. For most NSP towns, this work has already been completed by the MAPC.
- Available receiving water quality data should be assembled. This has already been done for several of the NSP towns by NepRWA.

NepRWA will prepare a template of the NSP Outfall Tool that is pre-populated with the above data for participating NSP towns upon request.

Technical support on setting up and using the NSP Outfall Tool or guidance for pre-populating data within the prioritization is available for NSP member communities from NepRWA and/or the MAPC. Please contact stormwater@neponset.org to request assistance.

Excel Tips:

- The spreadsheet includes two “macros” that allow you to sort the sheet in specific ways just by clicking a button. In order for this to work you will need to choose “enable active content” when you open the file.
- Selected columns and rows have been “grouped” to make it easy to expand or hide sections of the form. This makes it easier to navigate the wide spreadsheet. Just click the + or – buttons in the top margin to expand or contract groups of columns.
- The spreadsheet uses named ranges of rows to do some calculations. The area in black at the far bottom of the spreadsheet is outside the named ranges. To avoid breaking the calculations, if you need to add rows, insert them above the bottom of the named ranges (i.e. in the white rows not the black area).
- Data in the yellow row right below the field headings contains examples of what should go in the corresponding fields. You may need to click the + in the left margin to expand this row.
- Where a column contains a calculation, it has been given a background color to highlight this fact.
- Depending on how your particular copy of the tool is setup, data in the catchment score area may be linked to the raw data extracted from GIS which is stored on a separate tab of the workbook. If applicable this information will remain linked even if you sort the rows on the main worksheet.
- At the end of this document, we describe the intended use of each field in the spreadsheet.

Phase I: Preliminary Outfall Inventory and Ranking

The preliminary outfall inventory and ranking must be prepared by the end of permit year 1 (6/30/19). The goals of the preliminary inventory and ranking are to collect and organize available information about outfalls and catchments, recognizing that this information may be somewhat limited at the beginning of the IDDE process. Using this information, during Phase I you will:

- Identify known “problem” outfalls that will bypass dry weather screening and go directly to catchment investigation.
- Prepare a preliminary ranking of your outfalls into the categories of “high priority”, “low priority,” and “excluded,” as a first indication of the order in which their associated catchments will be investigated.
- Group outfalls by stream to determine the order of dry-weather screening (recommended but not required).
- Flag any catchments with already known system vulnerability factors that will require wet weather screening.

The Outfall Tool helps you to rank the outfalls and interconnections based on three broad categories of information:

- “Infrastructure and investigation data” provided by the Town
- “Catchment composition data” extracted from GIS
- “Receiving water quality data” assembled from available sources

Available information for each of the three categories is used to develop category scores. The weighted average of the category scores is used to calculate each outfall or interconnection’s final score. The final scores are then used to rank each of the outfalls as excluded, problem, high, or low priority. Finally, the outfalls are then grouped by stream segment and the stream segments are ranked to determine the order of dry weather outfall screening.

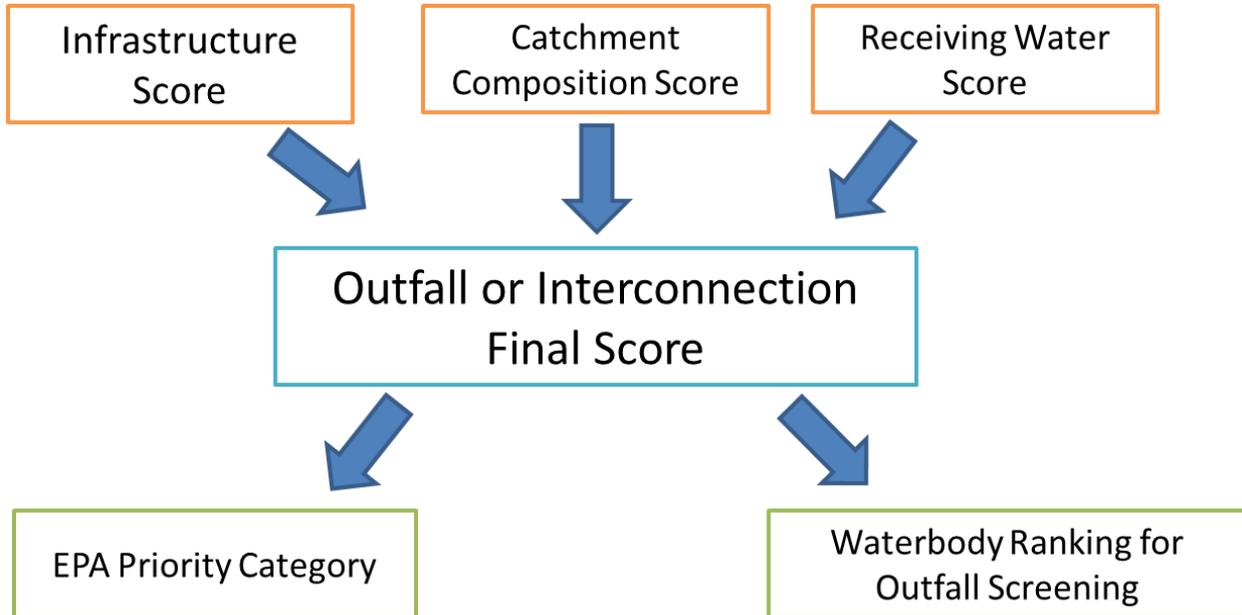


Figure 1: IDDE PT General Schema- The three category scores are used to generate the outfall or interconnection final scores which are then used to generate the two major outputs: the EPA priority category and the waterbody ranking for outfall screening.

Phase I, Step 1: Complete Information in Infrastructure and Investigation Section

The infrastructure and investigation category score is largely based on permittee knowledge and existing records. Town records, GIS data, and institutional knowledge from long-time staff members should be assembled and reviewed in preparation for filling in this portion of the tool. During this initial phase, you may have only limited available information to enter in this section of the tool, which is fine.

The information in this section is required by section 2.3.4.7.a.ii-iii and 2.4.3.8.c.i of the permit. You may want to review these sections of the permit if you have any questions about what to enter.

For each outfall, put a “1” or a “0” in each column in this section. A “1” denotes presence and “0” denotes absence. The infrastructure and investigation category score for each outfall is calculated by taking the sum of each of the above scores, dividing it by the number of factors in the category and multiplying that number by 100.

The fields in this section are fairly self-explanatory. They include:

- Known or suspected problems. Entering a “1” automatically categorizes the outfall as a “problem.” If you found sewage indicators during 2003 screening, enter a “1” here unless your 2003 screening fully meets the 2016 screening requirements, in which case enter it under the column for “Sewage indicators found during 2016 dry screening.”

- Past complaints. Entering a “1” automatically categorizes the outfall as a “problem.”
- Sewage indicators found during 2016 dry screening. Entering a “1” automatically categorizes the outfall as a “problem.” If no screening that meets all the 2016 MS4 Permit screening requirements has occurred yet, leave this field blank for now. If you enter a value in this field, we recommend also updating the “date outfall screening completed” field to the far right of the spreadsheet at the same time.
- Catchments with past septic to sewer conversion or combined sewer separation.
- Outfalls that discharge to culverted stream longer than a street crossing.
- High density of aging septic systems. The permit does not define what constitutes “high” density so make your own determination.
- One or more system vulnerability factors (as defined in the MS4 permit 2.4.3.8.c.i). Even if there are multiple system vulnerability factors only enter “1” in this field. Entering a “1” automatically flags the field for wet weather screening. Refer to the NSP model SWMP or the permit for a discussion of required and recommended system vulnerability factors.
- Sewage Indicators Found During WET Screening. Entering a “1” automatically categorizes the outfall as a “problem.”

The NSP Outfall Tool is designed to be used on an ongoing basis through all the different stages of the IDDE process. As such some fields, especially in the infrastructure section of the tool, will be left blank during the early portion of the IDDE process when information is not available, and may be filled in later or may have their values revised later, as new information is discovered. As described further below, we therefore recommend maintaining a “working” copy of the tool and periodically making “archive” or static PDF copies of the Tool at certain stages of the process to serve as a snapshot in time.

Phase 1, Step 2: Catchment Composition Score

For NSP communities using the tool, this section of the form will be pre-filled for you. The catchment composition category score is calculated using the density of the following:

- Catchment area (acres)
- Number of Medium Loading Businesses
- Number of High Loading Businesses
- Number of Houses (20-40 years old)
- Number of Houses (>40 years old)
- Length of Sewer Pipes in Catchment (Miles)

The information in this section is required by section 2.3.4.7.a.ii-iii of the permit. You may want to review this section of the permit if you have any questions about what is included here.

These data were generated using ArcGIS and the MAPC developed methodology¹. These data can be updated as land uses change through time by following the MAPC methodology.

Raw sub-scores in this category are normalized to a scale of 0 to 1 by dividing each value by the maximum value for that component. The final catchment composition category score is calculated by taking the average of the normalized commercial, residential, and sewer pipe sub-scores.

¹ Metropolitan Area Planning Council. “MS4 Outfall Catchment Calculator.”
<https://github.com/MAPC/stormwater-toolkit>

Phase 1, Step 3: Receiving Water Score

The receiving water category score is calculated from two main components, the receiving water use score and the receiving water quality score. For NSP communities using the tool, this section of the form will be pre-filled for you.

Receiving Water Use Score

The receiving water USE score is based on whether an outfall discharges to or near an area of concern to public health due to proximity of:

- Discharge to Public Beach, Shellfish or Recreational areas. For NSP communities, this information has been pre-filled by NepRWA and MAPC based on a combination of GIS and local knowledge. Communities should review this information and update it based on your own local knowledge.
- Discharge to Surface Water Supply Area. There are no surface drinking water supplies in NSP communities, so this field has been pre-filled with “0.”

A combination of MassGIS layers and local knowledge are used to determine if an outfall is within an area of concern to public health. Any outfalls within 500 meters of a public beach, drinking water supply or a shell fish bed, and any outfalls within 100 meters of recreational area. Recreational areas include known areas of more intensive recreational water contact such as canoe launches. These setbacks and the meaning of “recreational areas” are not specified in the MS4 permit. Outfalls within and area of concern are marked with a “1” all others are marked “0.”

If any of the above waterway-uses are present the outfall is automatically classified as a high priority (i.e. marking an outfall as a “1” makes it high priority automatically).

Receiving Water Quality Score

Each receiving water body was evaluated for:

- The number of stormwater related impairments from the MassDEP 303d List
- Average instream *E. coli* concentration where available

A list of the water quality impairments for each water body was compiled by NepRWA using the Massachusetts year 2014 Integrated List of Waters. For purposes of the Outfall Tool, any impairments that require additional monitoring under the 2016 MS4 permit are considered “stormwater-related.”

The average instream *E. coli* concentration is based on available ambient water quality data collected by Massachusetts Department of Environmental Protection, and/or the Neponset River Watershed Association. It is important to note that we do not have *E. coli* data for every waterbody. This was not an attempt to raise the priority of certain waterbodies, but is instead the result of a lack of available data. Waterbodies lacking any available data are scored as “1” in an attempt to minimize scoring bias on the basis of data availability. Any additional data which the Town may have access to can be added to this section by following the scoring scheme below. Note that if no data is available, you should enter “unknown” or another text string rather than leaving this field blank.

Table 1: Receiving Water Scoring Scheme

“Stormwater Related” Impairments Score		Dry Weather <i>E. coli</i> Score	
Score	Number of Impairments	Score	<i>E. coli</i> Concentration
0	No Impairments	0	<235 cfu/100mL
1	1-2 Impairment(s)	1	235-500 cfu/100mL or No Data Available
2	3-4 Impairments	2	> 500 cfu/100mL
3	≥ 5 Impairments		

The total receiving water quality score is calculated by taking the sum of the individual factors scores and dividing them by 7 (the maximum score possible).

Phase 1, Step 4: Preliminary Outfall Score and Priority Ranking:

The final overall score for each outfall and interconnection is automatically calculated by the Outfall Tool as data is filled in. The Tool uses a weighted average of the three category scores (infrastructure, catchment and water quality) to determine the final overall score. By default, the formulas in the NSP Outfall Tool weights each category equally. However, this weighting is not dictated by the permit, and the scores can be weighted as you see fit by editing the excel formula in the “final score” column.

As data is filled in for all outfalls (i.e. rows) in the Tool, the Tool automatically calculates the “EPA Priority Rank” using the formula contained in the field of the same name.

The formula determines outfall priority ranks based on two tests:

1) The 2016 MS4 permit defines certain attributes that if present automatically rank an outfall or interconnection as a problem or high priority. Outfalls or interconnections with these attributes are automatically ranked accordingly. These characteristics are described above and include

- Known or suspected problems, past complaints, sewage indicators in dry or wet screening.
- Outfalls near beaches, recreation areas, drinking water sources and shellfish beds.

2) Where these “automatic” attributes aren’t present, outfalls and interconnections are ranked according to their final score. By default, the NSP Outfall Tool ranks outfalls and interconnections that have final scores that are above the median score as “high priority,” and those with scores below the median as “low.” However, this approach is not dictated by the permit, and one may adjust this approach by modifying the formula in the “EPA Priority Ranking” column.

Investigation of ALL catchments must be completed by permit year 10, irrespective of priority rank. As such, defining an outfall as “high” or “low” priority has effectively no regulatory meaning. Problem outfalls do not need to undergo dry weather outfall screening, and must begin catchment investigation by the end of year two (6/30/20) and must be complete by the end of year seven.

Phase I, Step 6: Sort by Priority Outfall Ranking and Save a Snapshot

Sort the records in the spreadsheet first by “EPA Priority Category” and then by “Final Outfall Score.” The Tool includes a button titled “Sort for Catchments” at the top of the “Ranking Output” section that allows you to easily execute the recommended sort order.

At this point the sorted content of the tool represents your “Preliminary Outfall Ranking” which is due 6/20/19, and needs to be included in your year one annual report.

To permanently capture your Preliminary Outfall Ranking, we recommend that you save a copy of the workbook under a new name such as “Preliminary Outfall Ranking INSERT DATE Archive,” and that you also save a copy of the spreadsheet as a PDF by choosing “Save As” and selecting the .PDF file format option in the dropdown list right below the filename field. You may want to collapse or expand different sections of the form so that it fits on the page more easily.

Phase I. Step 7: Sort Outfalls by Waterbody to Determine Order of Dry Weather Screening

In order to increase dry weather outfall screening efficiency, the NSP SWMP suggests that outfall screening take place by stream reach. This will allow field crews to proceed quickly down the length of one stream, rather than moving from place to place to check on outfalls scattered across the town. This approach also ensures that each day's samples will need to be tested for the same parameters based on stream impairments. However, this recommended approach is not required by the permit.

In order to determine which stream segments should be screened first, the Outfall Tool calculates the number of high priority outfalls found on each stream reach (MassDEP AU ID). This value is found in the "Waterbody Ranking for Outfall Screening" column.

To determine which stream or waterbody should be screened first, simply re-sort the sheet first by "Waterbody Ranking for Outfall Screening" and then by "MassDEP Stream Segment ID" and lastly by the Town's outfall ID code. This will group the outfalls by stream, in order of priority. Again, the Outfall Tool provides a button named "Sort For Dry Screen" to make it easy to execute this sort order.

For planning purposes, we recommend that you then fill in a value in the "Date, Month or Year Dry Outfall Screening Scheduled" column, and review the overall number of outfalls to be covered during various time periods to balance the program workload.

Note that you may want to undertake some further manual sorting and re-ordering to accommodate any outfalls that don't have an MassDEP Stream Segment, or other irregularities. You can refine your dry weather screening plan, by adjusting the value in the "Date, Month or Year Dry Outfall Screening Scheduled" field and re-sorting the sheet on that column.

At this point, you should save snapshot copy of the spreadsheet or a PDF to document your justification for the order in which you decided perform dry weather screening on your streams and waterways.

Phase II: Update the Outfall Tool to Reflect Progress of Dry or Wet Weather Outfall Screening

The next phase of the overall IDDE process is to conduct dry weather outfall screening and inspection. Generally, Phase II begins once Phase I is completed, and must be finished by the end of permit year three (see caveats below). During this period, you may also be conducting wet weather outfall screening (if any) on outfalls with known system vulnerability factors, and documenting the progress of catchment investigation and repair for any problem outfalls. You need to report on your progress in each of these areas in each annual report during this period.

Note: once dry weather outfall screening has begun there is no need to revise your planned schedule for which streams will be screened first.

Phase II, Step 1: Document Progress in Completing Dry Weather Outfall Screening

The dry weather outfall screening will generate extensive records from individual outfall field inspection forms to lab test results and other materials. During this phase, the Outfall Tool provides a convenient way to summarize and report your overall progress.

As you complete dry weather screenings, update the working copy of your Outfall Tool by filling in the following fields:

- Date Dry Outfall Screening Completed. Located on the far right in the “Tracking” section of the sheet. Fill in the date that dry weather inspection/screening was completed on each outfall.
- Sewage Indicators Found During Dry Screening. Located in the “Infrastructure” section of the Tool. Fill in a “1” if sewage indicators were found and a “0” if they were not found. Leave this blank until you have completed the dry screening for the 2016 permit.

As you fill in this information, the outfall ranking scores will automatically update themselves.

Phase II, Step 2: Document Progress in Completing Wet Weather Outfall Screening

The permit does not require that wet weather screening be completed until the deadline for catchment investigation (i.e. year 10). However, where system vulnerability factors are known in advance of catchment investigation, we recommend completing wet weather outfall screening in advance of catchment investigation.

Irrespective of when you complete wet weather outfall screening, you should summarize your progress in this area by updating the “Date WET Outfall Screening Completed” field and simultaneously entering a “1” or “0” in the field for “Sewage Indicators Found During WET Screening,” located in the infrastructure section of the form.

Phase II, Step 3: Document Problem Catchment Investigation & Illicit Elimination

In the event that you have known problem outfalls, you will likely begin catchment investigation on them while dry weather screening is still ongoing, and you may identify and even eliminate illicit discharges during this period. If so, use the appropriate fields in the program tracking section of the form to summarize this work. Catchment investigation for problem outfalls must begin during permit year two (ending 6/30/20) and be complete by the end of permit year seven.

Phase II, Step 4: Annual Reporting and Follow Up Outfall Ranking

During Phase II you should update the Outfall Tool on an ongoing basis as you complete your IDDE work as described above. As you do so, catchment scores and EPA outfall categories will be automatically updated on a continuous basis. Re-sort the Outfall Tool using the sort for catchments button and make a PDF of the Outfall Tool and/or an Excel archive copy of the Tool to include in each annual report. At a minimum, you must submit the “follow up ranking of outfalls” by the end of permit year three (6/30/21).

Phase III: Catchment Investigation & Discharge Elimination

The last major phase of the overall IDDE process is catchment investigation. During this phase you will conduct internal inspections of junction manholes in all outfall catchments (except excluded outfalls) beginning with problem catchments and working your way down from high priority to low priority based on your follow up ranking of outfalls.

EPA assumes that during this phase, you may discover previously unknown system vulnerability factors, in which case, wet weather screening and wet weather catchment investigation will also need to be conducted as described in the NSP model SWMP. Refer to the model IDDE SWMP or the permit (section 2.4.3.8.c.i) for a discussion of required and recommended system vulnerability factors.

During Phase III, the NSP Outfall Tool can be used to summarize, track and report on your progress in each of these tasks.

Phase III, Step 1: Track Progress of Catchment Investigations and Schedule Wet Weather Investigations or Discharge Elimination as Needed

As you complete your catchment investigations, use the Outfall Tool to track your work by updating the following fields in the “Program Tracking” section of the tool on a continuous basis and at least annually:

- Date Catchment Investig. Scheduled
- Date WET Outfall Screening Scheduled
- Date WET Outfall Screening Completed
- Date Catchment Investig. Completed
- Catchment Investig. Status
- Date Illicit Discharge Source Confirmed
- Est. Illicit Discharge Volume (GPD)
- Date Illicit Discharge Elimination Scheduled
- Date Illicit Discharge Elimination Completed

At the same time, you should also update the “Infrastructure” section of the tool with newly discovered information including:

- System Vulnerability Factors Present in Catchment
- Sewage Indicators Found During WET Screening

Phase III, Step 2: Annual Reporting

During Phase III you should update the Outfall Tool on an ongoing basis and at least annually as you complete your IDDE work. Re-sort the Outfall Tool using the “sort for catchment” button and make a PDF of the Outfall Tool and/or an Excel archive copy of the Tool to include in each annual report.

Description of All Spreadsheet Fields and Tabs

Outfall Information Section

This section contains general identification information about each outfall and its corresponding receiving water. For NSP members this section has been pre-filled based on town mapping data but will need to be updated if new outfalls are discovered during field missions.

Owner – In most cases this will be the town that owns the outfall or interconnection

MassDEP Stream Segment – The Massachusetts DEP Assessment Unit ID (AU ID) for the receiving water body.

Waterbody Name – The name of the receiving waterbody. You can also put brief notes in this field.

Excluded Outfall? – Enter “1” if outfall is excluded. An outfall is excluded from screening if it meets the qualifications defined in section 2.3.4.7.a. ii. If the reason for exclusion is because the outfall is not waters of the US or not town-owned (see NSP Model IDDE SWMP), update the remarks field and/or the owner field as needed. Entering a “1” automatically sets the “EPA priority category” to “excluded.”

Outfall ID – Each outfall should have a unique identifier for data tracking purposes. This number is generated from the town’s system mapping or outfall database.

Infrastructure and Investigation Data Section

This section contains information based on previous reports, town knowledge, and infrastructure investigations. The “Sewage Indicators Found” and “System Vulnerability Factors Present” sections need to be updated on an ongoing basis as outfall screening and catchment investigations provide new data.

Known or Suspected Problem? Including 2003 MS4 screening – This indicates whether or not there is evidence of an illicit discharge from outfall screening or reports prior to the 2016 MS4 permit. If sewage indicators were found during screening under the 2003 permit, enter a “1” here. Entering a “1” automatically sets the EPA priority category to “Problem.” If a problem was found during 2003 screening, fixed, and then confirmed clean, enter a “0” and add a comment in the notes field.

Past Discharge Complaints or Reports? – This section indicates if the outfall has past complaints of discharges from citizens or environmental groups (hot spot reports), or the catchment has past complaints of backups or SSOs. Entering a “1” automatically sets the EPA priority category to “Problem.”

Sewage Indicators Found during 2016 MS4 DRY Screening – This section indicates if sewage indicators were found for an outfall during DRY WEATHER screening for the 2016 MS4 Permit. This needs to be updated regularly once dry screening begins. Entering a “1” automatically sets the EPA priority category to “Problem.” This field should be left blank until 2016 screening for the outfall is completed.

Septic to Sewer Conversion or CSO Separation in Catchment? – Indicates whether or not there have historically been areas in the catchment converted from septic to sewer, or if areas in the catchment were formerly served by a combined sewer system which has been separated.

Discharges to Culverted Stream Longer Than Street Crossing? – Indicates an outfall that discharges to a culverted stream. Do not include outfalls that discharge to a simple road crossing culvert. Enter “1” if the outfall discharges inside a long culvert, otherwise enter “0”.

High Density of Aging Septic Systems? – Indicates an outfall whose catchment includes a high density of aging septic systems. The permit does not define what constitutes a “high” density. Enter a “1” if the catchment has an unusual number of failed septic systems, otherwise enter “0”.

System Vulnerability Factors Present – This indicates that there are system vulnerability factors (SVFs) in the catchment. The list of required and optional SVFs can be found in the NSP model IDDE SWMP or in section 2.3.4.8.c.i. of the MS4 Permit. This should be initially filled out based on town knowledge and available records (which may be limited at first), and then updated regularly as new information is discovered through the catchment investigation process. Enter a “1” if there are known SVFs, otherwise enter “0”.

Sewage Indicators Found during WET Screening – This section indicates if sewage indicators were found for an outfall during WET WEATHER screening for the 2016 MS4 Permit. If no wet weather screening has been performed, leave it blank. This field should be updated regularly once wet screening (if any) begins. Enter “1” if sewage indicators were found, enter “0” if they were not. Entering a “1” automatically sets the EPA priority category to “Problem.” A wet weather catchment investigation is then also required.

Infrastructure Score – The infrastructure score is a measure of how likely an outfall will have an illicit discharge based on prior investigations and existing infrastructure. The infrastructure score for each outfall is calculated by taking the average of the component scores in this section multiplied by 100.

Catchment Composition Section

The catchment composition section assesses the potential for a catchment to have an illicit discharge in it based on the types of land use and infrastructure within the catchment. These data were generated using the MAPC “MS4 Outfall Catchment Calculator” method documentation for [which can be found on the NSP member resources page](#) HERE or refer to the full documentation and [GIS tools on GitHub](#). For NSP communities, this section will be pre-filled.

Catchment area (acres) – The size of the catchment associated with a specific outfall in acres from GIS.

Number of Medium Loading Businesses – The number of businesses within the catchment that have medium risk of having an associated illicit discharge according to The Center for Watershed Protection².

Number of High Loading Businesses – The number of businesses within the catchment that have a high risk of having an associated illicit discharge according to The Center for Watershed Protection².

Raw Generating Site Score (Businesses) – A weighted risk score based on the following formula ((Number of Medium loading businesses*5) + (Number of High loading businesses*10)). The permit does not define “density” so this specific approach is not required.

Normalized Generating Site Score (Businesses) – Divides the raw business generating site score by the maximum business generating score to normalize the values so they can be combined into a total catchment score.

Number of Houses (20-40 years old) – The number of houses within the catchment that have a medium risk of have an associated illicit discharge based on house age.

Number of Houses (>40 years old) – The number of houses within the catchment that have a high risk of have an associated illicit discharge based on house age.

Raw Generating Site Score (Residential) – A weighted risk score based on the following formula ((Number of 20-40 year old homes*5) + (Number of older than 40 year old Homes*10)). The permit does not define “density” so this specific approach is not required.

Normalized Generating Site Score (Residential) – Divides the raw residential generating site score by the maximum residential generating site score to normalize the values so they can be combined into a total catchment score.

Length of Sewer Pipes in Catchment (Miles) – The amount of sewerage within the catchment based on total length of pipe

Normalized Sewer Pipe Score – The length of sewer pipe in the catchment divided by the catchment area further divided by the maximum length of sewer pipes in catchment. The permit does not define “density” so this specific approach is not required.

² Environmental Protection Agency. “Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments.”
http://cfpub2.epa.gov/npdes/docs.cfm?program_id=6&view=allprog&sort=name#iddmanual Last Updated on October 1, 2004.

Catchment Score – This score is an estimate of the probability that an outfall will have an illicit discharge based on the composition of its catchment. The catchment score for each outfall is calculated by taking the average of the component scores in this section multiplied by 100.

Receiving Water Section

This section contains information about the uses and pollution level of the waterway to which each outfall discharges. The information for this section is based on MassGIS data, ambient water quality data, and local knowledge.

Discharge to Pub Beach, Shellfish or Rec – Indicates whether the outfall discharges within a close proximity of a public beach, recreation area, or shellfish bed. A 500-meter buffer around public beaches, drinking water supplies, and shellfish beds was used, and a 100-meter buffer around boat/canoe launches was used. The public beach and recreation area GIS layer should be supplemented with town knowledge.

Discharge to Surface Water Supply Area – This indicates whether or not the outfall discharges to a surface water supply.

Dry Weather E. coli Concentration – The average dry weather concentration of E. coli in the waterbody to which the outfall discharges. Based on data available from MassDEP, the Neponset River Watershed Association or other sources where available. This information should be pre-filled for NSP member communities and should be reviewed and updated with any additional local knowledge. Note if there is no data for an outfall's receiving water you should enter "unknown" or another text string rather than leaving this field blank so that the E. coli score column will be set to "1" rather than blank.

Dry Weather E.coli Score – This section is a score based on the average concentration of *E.coli* bacteria for each receiving waterbody. Not every water body has available *E.coli* data. To reduce the bias that would be created if a stream lacks E.coli data, all outfalls without data are stored as a "1".

Stormwater Related Impairments – This section reflects whether or not the receiving waterbody has stormwater related impairments. The numerical value in this field is a score based on how many impairments the waterbody has. An impairment is considered stormwater related if EPA requires additional monitoring for it. This information is pre-filled for NSP member communities or can be found in each community's NOI.

Receiving Water Score – The receiving water score is an estimate of the likelihood that an outfall contains an illicit discharge and the risk it poses to human health based on the recreational uses and quality of the receiving water. This score is calculated by taking average of the component scores multiplied by 100.

Ranking Output

The ranking output section contains the final score and the various rankings based on those scores. It also indicates whether an outfall requires additional wet weather screening. We recommend that outfall screenings be conducted according to stream rank. The order of catchment investigations should proceed with problem outfalls first, then high priority, etc sub-sorted by highest final outfall score first.

Final Outfall Score – The final outfall score is the overall score each outfall receives based on its three component scores (Infrastructure and Investigation, Catchment Composition, and Receiving Water).

EPA Priority Category – The EPA Priority Category is based either on the presence or absence of certain criteria or the final outfall score. Outfalls with final outfall scores greater than the median score are considered high priority and those with lesser values are considered low priority.

Number of High Priority Outfalls – A count of the number of high priority outfalls in the AU ID of the current outfall. In effect this field groups the outfalls by AU ID and is used to determine the order of outfall screening.

Stream Ranking for Outfall Screening – The stream ranking is how we recommend you prioritize outfall screening in order to maximize dry weather outfall screening efficiency in the field. This section ranks the receiving waterbodies by the number of high priority outfalls they contain with #1 being the highest rank.

Wet Weather Screening Required – Indicates whether or not wet weather screening will be required based on the presence or absence of system vulnerability factors in the catchment as indicated in the infrastructure section of the form.

Program Tracking

This section allows for easy tracking of screening and investigation progress and needs to be updated regularly.

Date DRY Outfall Screening Scheduled – Use this field to organize your work by entering a specific date, a year or other indicator of when the work is planned. Should be scheduled according to the EPA priority ranks and stream rank starting with high priority outfalls. Note that the results of the screening (i.e. clean or polluted) are summarized by updating the “screening” field in the infrastructure section of the form.

Date DRY Outfall Screening Completed – Enter the actual date that screening was marked complete.

Date WET Outfall Screening Scheduled -- Enter a specific date, a year or other indicator of when the wet weather screening is planned. If wet weather screening is not required, leave field blank.

Date WET Outfall Screening Completed -- Enter the actual date that screening was marked complete.

Date Catchment Investig. Scheduled -- Enter a specific date, a year or other indicator of when the investigation is scheduled to begin. Catchment investigations should begin with problem outfalls, and proceed according to catchment score through High Priority and Low Priority.

Date Catchment Investig. Completed -- Enter the actual date that investigation was marked complete.

Catchment Investigation Status – Once catchment investigation has begun, enter a short code of your own choice that summarizes the status of the investigation. We suggest the following scheme:

- “Ongoing.” Investigation started but not yet completed.
- “Ongoing, Awaiting Repairs.” Problems discovered during investigation, and remaining junction manholes cannot be inspected until upstream repairs are implemented.
- “Complete.” Catchment is complete with no outstanding issues.

- “Complete, Inconclusive.” Outfall shows sewage indicators and all junction manholes inspected in dry (and where applicable wet) weather, but source not found. Will need to be scheduled for further investigation.
- “Complete, Awaiting Repairs.” All junction manholes inspected, problems were found and are awaiting repair.

Date Illicit Discharge Source Confirmed – If illicit discharge was found, enter the date the source was confirmed. If no illicit discharge in catchment, leave blank.

Est. Illicit Discharge Volume (GPD) – If illicit discharge was found, enter the estimated volume of discharge in gallons per day. If no illicit discharge in catchment, leave blank.

Date Illicit Discharge Elimination Scheduled -- If illicit discharge was found, source isolated, and repair plan developed, enter the estimated date, month or year when you expect the repair to be implemented. If no illicit discharge in catchment, leave blank.

Date Illicit Discharge Elimination Completed – Enter the date on which you confirmed that the illicit discharge had been eliminated. If no illicit discharge in catchment, leave blank.

Year Ongoing Outfall Screening Scheduled – Once catchment investigation has been completed, indicate the year in which ongoing outfall screening has been scheduled (every 5 years). Otherwise leave blank.

Remarks – This is a place to record any notes related to an outfall and its investigations.