Program Effectiveness Strategy

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Hawaii State Department of Transportation
Highways Division, Oahu District
Storm Water Management Program
NPDES Permit No. HI S000001

September 2019

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION, OAHU DISTRICT

STORM WATER MANAGEMENT PROGRAM

PROGRAM EFFECTIVENESS STRATEGY

MS4 NPDES Permit No. HI S000001

State of Hawaii Department of Transportation
Highways Division, Oahu District
727 Kakoi Street, Honolulu, Hawaii 96819

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Record of Revision

Revision No.	Revision Date	Description	Sections Affected
Original Document	October 2014	Original	N/A
1	February 2015	Reformatted	All
2	February 2015	Table 1 Replaced	Section 2.1
3	April 2015	Draft Finalized. Date Changed.	All
4	September 2019	Revised Entire Document	All

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LIST OF ACRONYMS

BMP	Best Management Practice
CASQA	California Stormwater Quality Association
CY	Cubic Yards
DOH	State of Hawaii Department of Health
DOT-HWYS	State of Hawaii Department of Transportation, Highways Division, Oahu District
MEP	Maximum Extent Practicable
MS4	Municipal Separate Storm Sewer System
MS4 Permit	DOT-HWYS NPDES MS4 Permit No. HI S000001
No.	Number
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
RUSLE	Revised Universal Soil Loss Equation
SWMP	Storm Water Management Program
SWPCP	Storm Water Pollution Control Plan
TMDL	Total Maximum Daily Load

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CHAPTER 1
INTRODUCTION

This *Program Effectiveness Strategy* is submitted to satisfy Part G.1.d of the State of Hawaii Department of Transportation, Highways Division, Oahu District (DOT-HWYS) National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. HI S000001, effective October 28, 2013, and modified April 1, 2016. The MS4 Permit Part G.1.d requires DOT-HWYS to submit to the State of Hawaii Department of Health (DOH) a written strategy for determining the effectiveness of the Storm Water Management Program (SWMP), within one year of the effective date of the MS4 Permit (by October 28, 2014). The requirement reads as follows:

MS4 Permit Part G Reporting Requirements:

> *Part G.1.d Program Effectiveness Reporting – "Within one (1) year of the effective date of the permit, the Permittee shall submit to DOH a written strategy for determining the effectiveness of its SWMP. The strategy shall include water quality monitoring efforts as well as program implementation information and other indicators. The Permittee shall include an assessment of program effectiveness and identification of water quality improvements or degradation beginning with the 2nd Annual Report."*

The revision of the *Program Effectiveness Strategy* from the *2015 SWMP Plan* version reflects DOT-HWYS evolution from a compliance-based approach to one where systematic program enhancements are made with a method for determining program effectiveness.

This document introduces and discusses key concepts and provides standardized terminology related to the development of a comprehensive framework for assessing the effectiveness of the DOT-HWYS SWMP. Furthermore, this document outlines the approach that DOT-HWYS will use to adaptively manage their SWMP to improve effectiveness of Best Management Practices (BMPs) in reducing pollutants of concern, thereby achieving the maximum extent practicable (MEP) standard and the protection of water quality.

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CHAPTER 2
STRATEGY

The Program Effectiveness Strategy incorporates elements of the California Stormwater Quality Association (CASQA) guidance documents, An Introduction to Stormwater Program Effectiveness Assessment (2007) and A Strategic Approach to Planning for and Assessing the Effectiveness of Stormwater Programs (2015). The approach is built on CASQA's Outcome Levels framework, assessment methods, analytical methods, and targeted outcomes.

2.1 STORM WATER OUTCOME LEVELS

The ultimate goal of any SWMP is water quality improvement, and the Outcome Levels reflect the relationship between an activity and its effect on water quality. Assessment outcomes are grouped in six levels and represent a gradation from activity-based to water-quality based outcomes. The Outcome Levels consist of:

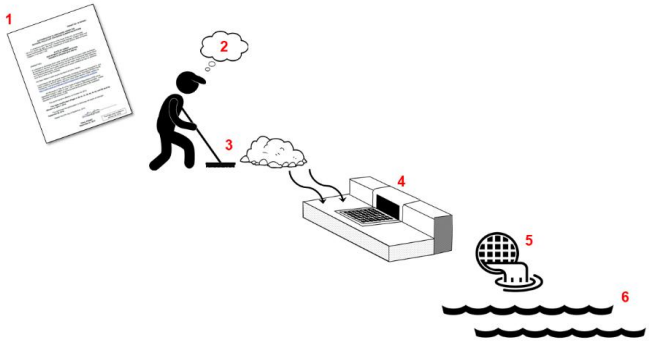
(1) Permit Compliance
(2) Knowledge and Awareness
(3) Behavioral Changes
(4) Load Reductions
(5) MS4 Discharge Quality
(6) Receiving Water Quality

The Outcome Levels may generally be seen as degrees of separation from tangible water quality benefits and assessments should be conducted at the highest Outcome Level supported by data.

In general, Levels 1 through 4 may be considered *Indirect* Outcomes, as these outcomes are often assigned to implementation activities that may have a correlation with water quality improvement and serve as a proxy for water quality, but have no direct causal relationship. Levels 4 through 6 are considered *Direct* Outcomes as these outcomes demonstrate a direct, measurable effect on water quality.

Note that Outcome Level 4 may be considered either an Indirect or Direct Outcome, as in certain situations a causal relationship may be established between a Level 4 outcome and water quality benefits.

Also note that each Outcome Level has value in informing management decisions, and the achievement of Outcome Level 6 may not be possible for every control



Gradation of activity-based to water-quality based outcomes: Outcome Levels 1 through 6.

measure. For example, in many instances Outcome Levels 2 or 3 may be sufficient for the effectiveness evaluation of outreach or training program implementation.

Outcome Level 1: Permit Compliance. Many program activities are conducted as a direct requirement of the NPDES Permit and therefore, Level 1 outcomes may take the form of a simple yes/no answer. Examples include developing a Public Education and Outreach Plan or maintaining an inventory of construction sites. Level 1 outcomes are assumed to be beneficial to water quality, but are not considered Direct Outcomes as it lacks the causal effect to support this assumption.

Outcome Level 2: Knowledge and Awareness. Outcomes at this level gauge whether educational efforts are progressing toward changes in knowledge and awareness. Measuring these outcomes is achieved through various methods including surveys and quizzes; and may be inferred through observation of public involvement such as counting the number of website visits, social media impressions, training attendees, and number of connections permits issued. Similar to Outcome Level 1, Level 2 outcomes are assumed to be beneficial to water quality but are considered Indirect Outcomes.

Outcome Level 3: Behavioral Changes. Level 3 outcomes measure the effectiveness of programs in motivating target audiences to change their behaviors and implement appropriate BMPs. These behavior changes are tracked using surveys (e.g., public education surveys), site inspections (e.g., number of construction site deficiencies), and tabulating changes in program involvement (e.g., percentage of commercial facilities conducting corrective actions on time). Outcomes at Level 3 are considered Indirect Outcomes.

Outcome Level 4: Load Reductions. Outcomes at Level 4 quantify reductions in pollutant loads from sources after a BMP has been implemented. These outcomes include load reductions such as debris collected from street sweeping, volume of trash removed from Adopt-A-Highway, and volume of discharge prevented by implementing spill response procedures. Outcome Level 4 data should be analyzed temporally to provide feedback on the effectiveness of implemented BMPs. As a causal relationship between load reductions and water quality improvements may or may not be identified, Level 4 outcomes may either be considered an Indirect Outcome or Direct Outcome.

Outcome Level 5: MS4 Discharge Quality. The primary goal of the DOT-HWYS SWMP is to reduce pollutants in storm water runoff to the MEP, and ensure that discharges do not cause or contribute to exceedances in water quality standards in receiving waters. As such, Level 5 outcomes are the most direct measure of program effectiveness and are considered a Direct Outcome. Level 5 outcomes measure reductions in one or more pollutant of concern discharging from the DOT-HWYS MS4.

Outcome Level 6: Receiving Water Quality. Level 6 outcomes may be expressed through compliance with regulatory benchmarks or water quality standards, Total Maximum Daily Load implementation, protection of biological integrity, and other monitoring assessments. Receiving water quality is dependent on a watershed approach and relies upon partnerships with other agencies, land owners, and stakeholders, and may take years to establish a reliable data set.

2.2 DATA COLLECTION

The Outcome Level descriptions in Section 2.1 identify several methods for data collection. Data collection and subsequent analysis are important to consider in the design of *Enhanced BMP*s. The term *Enhanced BMP* is utilized throughout this document to identify a practice or program that is systematically targeted for improvement. Examples of enhancements include increasing the frequency of an activity, revising a practice, implementing a new training, or updating a plan.

A variety of data collection approaches and assessment methods are available to evaluate the performance of implementation activities, program elements, and short- and long-term goals.

Data collection methods may be broadly categorized into the following approaches provided by CASQA.

Table 1. Approach to Data Collection (CASQA 2007).

APPROACH TO DATA COLLECTION (CASQA 2007)	
APPROACH	DESCRIPTION
Confirmation	This approach consists of documenting whether an activity or task has been completed. This is often expressed as a positive or negative outcome. This assessment method should be exclusively used for Outcome Level 1 activities.
Tabulation	Tabulation is a simple accounting method and may be expressed in both absolute numbers and in relative percentages. Tabulations is a common assessment method and useful for Outcome Levels 1 through 3.
Surveying	Surveying is comprised of a variety of methods, including interviews designed to discern the knowledge, attitudes, awareness, or behaviors of a target audience. Surveys are applicable for Outcome Levels 2 and 3.
Quantification	Quantification applies to efforts to quantify reductions in loading or runoff discharges. Quantification is most applicable to Outcome Levels 4 through 6.
Inspections	Site inspections and audits are common tools used to verify compliance or gather additional data by observations, record reviews, and sampling. Inspections are commonly used for Outcome Levels 3 through 5.
Reporting	Reporting includes receipt of implementation, compliance, or other assessment-related information by external parties.
Monitoring	Monitoring is the measurement of environmental or water quality conditions. Monitoring may be achieved through sampling or through observation. Monitoring methods apply exclusively at Outcome Levels 4 through 6.

2.3 DATA ANALYSIS

Data analysis involves the selection of the appropriate analytical method to evaluate the effectiveness of an *Enhanced BMP*.

A common mistake that can severely limit the explanatory value of the data is the failure to identify specific analytical approaches up front. Specificity is critical, and the choice of the analytical method may dictate what specific metrics to use, how the data may be collected, and the quality of the results. Analytical methods may be qualitative or quantitative, but all outcomes should have one analytical method associated with them.

CASQA provides these general approaches to data analysis.

Table 2. Approach to Data Analysis (CASQA 2015).

APPROACH TO DATA ANALYSIS (CASQA 2015)	
Qualitative Assessment	• **Confirmation:** Confirmation (Yes/No) that a program activity was in operation during the year or that a plans or materials were made available. • **Completion:** Confirmation (Yes/No) a specific task was completed.
Descriptive Statistics	Numbers that are used to summarize and describe data. This includes statistical counts, averages, and variance.
Comparison to Reference Points	Comparison to an established reference point includes established targets such as benchmarks, waste load allocations, water quality standards, and targeted outcomes; or other reference points such as other MS4 programs, previous results, baseline values, etc.
Temporal Change	The most general goal of trend analysis is to look at data over time to discern whether or not a given indicator has increased or decreased over time, and if it has, how quickly or slowly the increase or decrease has occurred.
Spatial Analysis	Spatial analysis allows comparisons between watersheds or other geographic areas. The ability to conduct spatial analysis is generally limited by the availability or appropriate data for spatial characteristics.

2.4 TARGETED OUTCOMES

Establishing targeted outcomes will identify desired changes and the specific strategies to develop to achieve those changes. Targeting creates a context for establishing measurability, interpreting results, and evaluating success over time. The upfront identification of applicable data requirements will ensure that outcomes are measurable and can be analyzed once resultant data is available.

Deciding on where to set the targeted outcomes is challenging. Management questions form the basis for the types of data that must be gathered and evaluated. The types of questions to formulate include evaluating relationships of data between Outcome Levels and/or in relation to geospatial area, land use, target audience, or time interval.

CASQA provides these general elements to consider in establishing a targeted outcome.

Table 3. Approach to Establishing Targeted Outcomes (CASQA 2015).

APPROACH TO ESTABLISHING TARGETED OUTCOMES (CASQA 2015)	
ELEMENTS	EXAMPLES
• The **direction** of change.	• Increase or decrease
• The **nature** of the outcome.	• Hotline calls received, chemical concentration
• The **metric** (magnitude + unit) of the change.	• 20 people, 50%, 3.0 mg/L, 30 lbs
• The **reference point** from which change is measured.	• Existing or baseline levels, previous results, results at another location
• The **timeframe** for achieving the change. This may include time elapsed or a **period of time**.	• Hours, days, months, years, reporting period, permit cycle

When crafting a targeted outcome statement, start with a general outcome statement then add specifics as follows:

[Direction] in **[Nature]** by **[Metric]** over **[Reference Point]** by **[Timeframe].**

For example, a targeted outcome for the Industrial and Commercial Program Training *Enhanced BMP* is as follows:

[Increase] in [test results from Training] to [80% score average] by [end of the permit term].

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CHAPTER 3
METHODOLOGY AND APPROACH

In applying the *Program Effectiveness Strategy* to BMP enhancement, DOT-HWYS seeks to establish a methodological approach that considers the data collection and analysis needs during the initial design. Establishing whether BMPs meet the MEP criteria is feasible only if sound design creates a feedback mechanism on effectiveness.

DOT-HWYS methodology is a systematic approach to evaluate BMPs for enhancement and subsequent effectiveness assessment. The BMP evaluation is a three-part exercise to: (1) assign Outcome Levels to existing BMPs; (2) select Program BMPs to enhance; and (3) establish targeted outcomes.

3.1 ASSIGN OUTCOME LEVELS

First, DOT-HWYS completed a comprehensive review of the existing BMPs implemented. For each BMP, DOT-HWYS assigned an Outcome Level, selected the data collection method, and identified the assessment parameters for analysis.

The following tables detail the BMP evaluations for each program.

Table 4. Public Education and Outreach Program BMPs.

MS4 PERMIT PART	PUBLIC ED & OUTREACH BMPS IMPLEMENTED	OUTCOME LEVELS	DATA COLLECTION METHOD	ASSESSMENT PARAMETERS
D.1.a.(1)	Public Education and Outreach Plan	(1) Permit Compliance	Completion	Permit compliance
D.1.a.(2)	Adopt-A-Highway Program	(4) Load Reductions	Quantification	Cubic yards of trashed removed
D.1.a.(2)	Websites	(2) Knowledge and Awareness	Tabulation	No. of website visits
D.1.a.(2)	Social Media	(2) Knowledge and Awareness	Tabulation	No. of impressions and open rate
D.1.a.(2)	School Outreach	(2) Knowledge and Awareness	Tabulation Tabulation	No. of students No. of activity books distributed
D.1.a.(2)	Public Outreach Events	(2) Knowledge and Awareness	Tabulation	No. of event attendees
D.1.a.(2)	Other Display Materials	(2) Knowledge and Awareness	Tabulation	No. of materials distributed
D.1.a.(3)	Storm Water Awareness Surveys	(3) Behavioral Changes	Survey	Average behavior score
D.1.a.(3)	Public Education Evaluation Matrix	(2) Knowledge and Awareness	Tabulation	Various

Table 5. Public Involvement/Participation Program BMPs.

MS4 PERMIT PART	PUBLIC ED & OUTREACH BMPS IMPLEMENTED	OUTCOME LEVELS	DATA COLLECTION METHOD	ASSESSMENT PARAMETERS
A.6	Public Review and Comment	(1) Permit Compliance	Confirmation	Permit compliance
D.1.b	Storm Water Management Program Plan	(1) Permit Compliance	Completion	Permit compliance

Table 6. Illicit Discharge Detection and Elimination Program BMPs.

MS4 PERMIT PART	IDDE BMPS IMPLEMENTED	OUTCOME LEVELS	DATA COLLECTION METHOD	ASSESSMENT PARAMETERS
D.1.c.(1)	Connection Permits	(2) Knowledge and Awareness	Tabulation	No. of connection permits issued
D.1.c.(2)	Outfall Screening	(3) Behavioral Changes	Tabulation	Percentage of outfalls with identified improper discharges
D.1.c.(3) D.1.c.(4)(i)	Track Cases in AMS Maximo	(1) Permit Compliance	Confirmation	Permit compliance
D.1.c.(4) D.1.c.(4)(iii)	Investigate Complaints	(3) Behavioral Changes	Tabulation	No. of complaints investigated
D.1.c.(4)(ii)	Public Reporting of Illicit Discharges	(3) Behavioral Changes	Tabulation	No. of public complaints
D.1.c.(5)(i) D.1.c.(5)(ii)	Enforcement	(3) Behavioral Changes	Tabulation	Enforcement on-time response percentage
D.1.c.(6)	Spill Prevention Response	(4) Load Reductions	Quantification	Gallons of discharge prevented from entering MS4
D.1.c.(7)	Disposal of Used Oil and Toxic Materials	(1) Permit Compliance	Confirmation	Permit compliance
D.1.c.(8)	Training	(2) Knowledge and Awareness	Tabulation Survey	No. of training attendees

Table 7. Construction Site Runoff Control Program BMPs.

MS4 PERMIT PART	CONSTRUCTION BMPS IMPLEMENTED	OUTCOME LEVELS	DATA COLLECTION METHOD	ASSESSMENT PARAMETERS
D.1.d.(1)	Construction BMP Implementation	(1) Permit Compliance	Completion	Permit compliance
D.1.d.(2)	Inventory of Construction Sites	(1) Permit Compliance	Confirmation	Permit compliance
D.1.d.(3)(ii)	Connection and Discharge Permits Associated with Construction Activities	(2) Knowledge and Awareness	Tabulation	No. of connection and discharge permits issued
D.1.d.(3)(iv)	Plan Review Checklist	(1) Permit Compliance	Completion	Permit compliance
D.1.d.(3)(i) D.1.d.(3)(iii) D.1.d.(4)(i)	Construction NPDES Review and Approval Process	(3) Behavioral Changes	Tabulation Tabulation	No. of projects with plans reviewed No. of permits with plans reviewed
D.1.d.(4)(ii)	Contract Construction Project Inspections	(3) Behavioral Changes	Tabulation	No. of deficiencies (critical, major, minor)
D.1.d.(4)(iii)	Encroachment Construction Project Inspections	(3) Behavioral Changes	Tabulation	No. of deficiencies (critical, major, minor)
D.1.d.(4)(iv)	Inspection Form(s), Inspection Checklist, and Reporting and Corrective Procedures	(1) Permit Compliance	Completion	Permit compliance
D.1.d.(5)(i) D.1.d.(5)(ii) D.1.d.(6)	Enforcement	(3) Behavioral Changes	Tabulation	Average days for corrective action (critical, major, minor)
D.1.d.(7) D.1.d.(8)	Training and Education	(2) Knowledge and Awareness	Tabulation Survey	No. of training attendees Average questionnaire score

Table 8. Post-Construction Storm Water Management in New Development and Significant Redevelopment Program BMPs.

MS4 PERMIT PART	POST-CONSTRUCTION BMPS IMPLEMENTED	OUTCOME LEVELS	DATA COLLECTION METHOD	ASSESSMENT PARAMETERS
D.1.e.(1)	Design Criteria	(1) Permit Compliance	Completion	Permit compliance
D.1.e.(2)	Design Review	(2) Knowledge and Awareness	Tabulation	No. of projects reviewed for PBMP inclusions
D.1.e.(3)	BMP Operation, Maintenance, and Inspection Database	(4) Load Reductions	Quantification	Cubic yards of debris removal
D.1.e.(4)(i)	Education and Outreach	(1) Permit Compliance	Confirmation	Permit compliance
D.1.e.(4)(ii)	Training	(2) Knowledge and Awareness	Tabulation	No. of training attendees

Table 9. Pollution Prevention/Good Housekeeping – Debris Control Program BMPs.

MS4 PERMIT PART	DEBRIS CONTROL BMPS IMPLEMENTED	OUTCOME LEVELS	DATA COLLECTION METHOD	ASSESSMENT PARAMETERS
D.1.f.(1)(i)	Asset Management System	(2) Knowledge and Awareness	Tabulation	No. of structure additions/deletions
D.1.f.(1)(ii)(a)	Street Sweeping	(4) Load Reductions	Quantification	Cubic yards of debris removed
D.1.f.(1)(ii)(b)	Storm Drain Inspection and Cleaning	(4) Load Reductions	Quantification	Cubic yards of debris removed
D.1.f.(1)(iii)	Storm Drain Placard Installation Program	(2) Knowledge and Awareness	Survey	Awareness results from public education survey
D.1.f.(1)(iv)	Action Plan for Retrofitting Structural BMPs	(1) Permit Compliance	Completion	Permit compliance
D.1.f.(1)(v)	Trash Reduction Plan	(1) Permit Compliance	Completion	Permit compliance

Table 10. Pollution Prevention/Good Housekeeping – Chemical Applications Program BMPs.

MS4 PERMIT PART	CHEMICAL APPLICATIONS BMPS IMPLEMENTED	OUTCOME LEVELS	DATA COLLECTION METHOD	ASSESSMENT PARAMETERS
D.1.f.(2)(i)	Authorized Use List	(1) Permit Compliance	Completion Tabulation	Permit compliance Gallons of herbicide applied
D.1.f.(2)(ii)	Chemical Applications Training	(2) Knowledge and Awareness	Tabulation	No. of training attendees

Table 11. Pollution Prevention/Good Housekeeping – Erosion Control Program BMPs.

MS4 PERMIT PART	EROSION CONTROL BMPS IMPLEMENTED	OUTCOME LEVELS	DATA COLLECTION METHOD	ASSESSMENT PARAMETERS
D.1.f.(3)(i)	Identification of Potential Erosion Areas	(1) Permit Compliance	Confirmation	Permit compliance
D.1.f.(3)(ii)	Temporary Erosion Control	(4) Load Reductions	Quantification	Cubic Yards of debris removed
D.1.f.(3)(v)	Permanent Erosion Control	(4) Load Reductions	Quantification	RUSLE calculation for pollutant reduction (kg/yr)
D.1.f.(3)(iii)	Maintenance Plan for Vegetation	(1) Permit Compliance	Completion	Permit compliance
D.1.f.(3)(iv)	Action Plan to Address Erosion at Storm Drain Outlets	(1) Permit Compliance	Confirmation	Permit compliance

Table 12. Pollution Prevention/Good Housekeeping – Maintenance Activities BMPs Program BMPs.

PERMIT PART	MAINTENANCE BMPS IMPLEMENTED	OUTCOME LEVELS	DATA COLLECTION METHOD	ASSESSMENT PARAMETERS
D.1.f.(4)(i)	Maintenance Activities BMP Manual	(1) Permit Compliance	Completion	Permit compliance
D.1.f.(4)(ii)	Training	(2) Knowledge and Awareness	Tabulation	No. of attendees
D.1.f.(4)(iii)	Pump Station	(1) Permit Compliance	Confirmation	Permit compliance

Table 13. Industrial and Commercial Activities Discharge Management Program BMPs.

MS4 PERMIT PART	IC ACTIVITIES BMPS IMPLEMENTED	OUTCOME LEVELS	DATA COLLECTION METHOD	ASSESSMENT PARAMETERS
D.1.g.(1)	Connection and Discharge Permits	(2) Knowledge and Awareness	Tabulation	No. of connection and discharge permits issued
D.1.g.(2)	Industrial and Commercial Facility Inventory	(1) Permit Compliance	Completion	Permit compliance
D.1.g.(3)	Commercial Facility Ranking	(1) Permit Compliance	Confirmation	Permit compliance
D.1.g.(4)	Priority Areas for Inspections	(1) Permit Compliance	Completion	Permit compliance
D.1.g.(5)	Industrial and Commercial Inspection Program	(3) Behavioral Changes	Tabulation	Percentage of reinspected facilities resulting in deficiencies
D.1.g.(6)	SWPCPs Review	(2) Knowledge and Awareness	Tabulation Tabulation	No. of SWPCPs reviewed Industrial Facilities without NPDES reported to DOH
D.1.g.(7)	Enforcement	(3) Behavioral Changes	Tabulation	Enforcement on-time response percentage
D.1.g.(8)	Training	(2) Knowledge and Awareness	Tabulation Survey	No. of training attendees

Table 14. Municipal Industrial Facilities Program BMPs.

MS4 PERMIT PART	MUNICIPAL INDUSTRIAL BMPS IMPLEMENTED	OUTCOME LEVELS	DATA COLLECTION METHOD	ASSESSMENT PARAMETERS
E.2	Baseyard Inspections	(3) Behavioral Changes	Tabulation	No. of deficiencies
E.3	NOIs and SWPCPs	(1) Permit Compliance	Completion	Permit compliance

Table 15. Monitoring Program BMPs.

MS4 PERMIT PART	MONITORING BMPS IMPLEMENTED	OUTCOME LEVELS	DATA COLLECTION METHOD	ASSESSMENT PARAMETERS
F.1.a F.1.b	Annual Monitoring Plan	(1) Permit Compliance	Completion	Permit Compliance
F.2	Storm Water Associated with Industrial Activities	(4) Load Reductions	Monitoring	Pollutant concentration from sampling
F.3	TMDL Implementation	(4) Load Reductions	Confirmation Quantification	Permit compliance Pollutants removed (kg/yr)
F.4	Other TMDLs	(1) Permit Compliance	Completion	Permit compliance

3.2 IDENTIFY BMPS TO ENHANCE

From the list of existing BMPs implemented, DOT-HWYS will then identify the BMPs targeted for enhancement. BMPs targeted for enhancement are selected to address a prioritized problem, achieve a program goal, or to capitalize on an opportunity.

To track progress in meeting the targeted outcomes, metrics are developed to assure that an assessment can be made. When selecting a data collection method, a spectrum of targeted outcomes, programmatic outcomes, and data gap resolution goals will be considered. This step is critical to conduct the desired analysis, and report on the goals and metrics during the next step.

Table 16. Example of Industrial and Commercial Program BMPs Selected for Enhancement.

INDUSTRIAL AND COMMERCIAL PROGRAM BMPS ENHANCEMENTS			
BMPS	ENHANCEMENTS	OUTCOME LEVELS	DATA COLLECTION METHODS
Commercial Facility Ranking	Revise ranking factors	1	Completion
Training	Develop a more formal training	2	Survey

3.3 ESTABLISH TARGETED OUTCOMES

Once the *Enhanced BMPs* are identified, DOT-HWYS will utilize the Assessment Strategy Worksheet to establish targeted outcomes and an implementation timeline. The Assessment Strategy Worksheet considers the selection of measureable targets, performance standards, and metrics that may be used to assess effectiveness of programs.

The Assessment Strategy Worksheet is also the tool DOT-HWYS will use to complete the feedback mechanism, as the evaluation of assessment results and the identification of next actions are documented in this worksheet.

Table 17 shows an example of a completed Assessment Strategy Worksheet.

Table 17. DOT-HWYS Assessment Strategy Worksheet with Example of Enhanced BMP.

DOT-HWYS ASSESSMENT STRATEGY WORKSHEET

SWMP Program:
Industrial and Commercial Storm Water Management

Date: 1/23/19
Enhanced BMP MS4 Permit Part: D.1.g.(8)
AR 17-18 Section: 11.1.8
☐ Single BMP
☒ Applicable to Program BMPs:
IDDE
Outcome Level 2
Assessment Results:

1. Review the Program BMPs table. (*Completed in Section 3.1)*

2. Assign an Outcome Level to each BMP in the Program BMPs table. (*Completed in Section 3.1)*

3. Identify BMP to enhance:

Training

4. Establish a targeted outcome to determine effectiveness:

[Direction of change] *of* [BMP] *by* [Metric units] *over* [Reference Point] *by* [Timeframe].

Test results from training will average an 80% score at the end of the permit term.

5. Identify approach to data collection:

☐ Confirmation ☐ Tabulation ☒ Survey ☐ Quantification ☐ Inspections ☐ Reporting ☐ Monitoring

Identify if data is currently tracked or will need to be tracked (and if so describe tools needed to track):
Survey data will need to be tracked and Excel will be the application used.

6. Identify analytical method for data collection:

☐ Qualitative Assessment ☐ Statistics ☒ Comparisons ☐ Temporal Change ☐ Spatial Analysis

Provide a brief description of the analytical method:
Survey results will be compared to the 80% benchmark.

7. Timeline for Implementation:

☐ Days ☐ Months ☒ Years ☐ Reporting Period ☐ Permit Cycle ☐ Other

a. Pre-Activity Preparation: January 23, 2019 – December 31, 2019

b. Tasks and Activities: January 1, 2020 – December 31, 2020

c. Post-Activity and Tracking: January 1, 2021

8. Execution:

a. Start Date: January 1, 2020

b. End Date: N/A

c. Interim Milestones Dates, as applicable:

9. Evaluation of Assessment Results:

10. Use of Data: *Based on results of the BMP assessment, the Program may be modified to:*

☐ Improve activities that did not accomplish goals.
☐ Discontinue efforts that may no longer be productive.
☐ Expand upon efforts that proved to be effective.
☐ Shift priorities for more effective use of resources.

Next Action(s):

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CHAPTER 4
PROGRAM EFFECTIVENESS REPORTING

The evolution of the DOT-HWYS SWMP through the iterative process of program planning, program implementation, and effectiveness assessment will be documented in the DOT-HWYS Annual Report.

The Annual Report *Sections* for each Program chapter will generally follow the format below.

1. **Program Implementation of BMPs**

   This section provides a table that cross references the following program elements: MS4 Permit regulations, *2015 SWMP Plan* language, the BMPs requirements, and the Annual Report Section. This section also provides a brief description of the BMPs implemented for each program.

2. **Program BMPs Assessment**

   This section reports on the data collected for activities performed during the reporting period to meet MS4 Permit requirements.

   2.1 BMP Assessment Metrics

   Presented in a table format, this subsection documents the performance of all Program BMPs in comparison to the assessment parameters established in the *Program Effectiveness Strategy* Section 3.1.

   2.2 Enhanced BMPs

   This subsection highlights the implementation of *Enhanced BMPs* and evaluates the assessment results.

3. **Future Activities**

   This section describes the planned activities, as well as specific measurable goals to be met in the next reporting period.

   3.1 Continue Implementation of BMPs

   This subsection identifies the BMPs that will not be enhanced in the next reporting period, but will continue to be implemented as described in the *2015 SWMP Plan.*

   3.2 Future Enhanced BMPs

   This subsection details the BMPs targeted for enhancement in the next reporting period, and identifies the data collection and data analysis methods that will be utilized.