



**Bureau Water Quality
Division of Water Quality Management
Industrial Stormwater Program**

Standard Operating Procedure for Effluent Monitoring subject to Maine's MSGP

1. **APPLICABILITY.** This Standard Operating Procedure (SOP) applies to specific industrial activities covered under Maine's 2016 Multi-Sector General Permit (MSGP) for Stormwater Discharges Associated with Industrial Activity. Discharges from industrial sites with specific activities classified under Sector Codes C, D, E, H, K, L, S, & O listed in Maine's 2016 MSGP are subject to analytical numeric effluent monitoring for stormwater discharges. Industrial sites with specific activities classified under Sectors A& J are also subject to numeric monitoring for activity based non-stormwater discharges. Additionally, discharges from industrial sites with specific activities classified under Sector Codes A, B, & N listed in the 2016 MSGP are subject to analytical benchmark monitoring for stormwater discharges. (See Also Table 1 in this SOP)
2. **PURPOSE.** To establish standardized methods of data collection and record keeping of all analytical effluent monitoring data as described in Special Condition N of Maine's MSGP.
3. **DEFINITIONS.**
 - 3.1. **GRAB SAMPLE.** Discharge sample collected as a single uninterrupted event from a single stormwater outfall from the industrial facility. Samples may be collected manually or with an automatic sampler.
 - 3.2. **HOLD TIME.** The maximum amount of time after collection that a sample is considered suitable for laboratory analysis. Hold times are specified in the EPA test methods listed in 40 CFR Part 136 and vary greatly depending on the pollutant parameters to be analyzed.
 - 3.3. **QUALIFYING STORM EVENT.** A storm event that is precipitation or ice/snow melt that produces a measurable discharge of 0.1 inch or more in a 24-hour period at an outfall and occurs at least 72 hours after a previous qualifying storm event.
 - 3.4. **MULTI-SECTOR GENERAL PERMIT ("MSGP").** A General Permit which authorizes the direct discharge or point source discharge of stormwater associated with industrial activity to waters of the State or to a MS4 that discharges to waters of the State, provided the discharge meets the requirements stated within the permit. This permit does not regulate discharges to groundwater. This permit is effective from March 7, 2017, and expires March 6, 2022, and replaces Maine's 2011 MSGP for Industrial Activities issued April 26 11, 2011. The Department plans subsequent re-issuances of this permit.
 - 3.5. **OUTFALL.** Any direct discharge from an area of industrial activity to waters of the State or to a Municipal Separate Storm Sewer System (MS4) that discharges to waters of the State. Examples include: discharges from ditches, swales, catch basins, culverts or pipes, rills, road ways, boat ramps or treatment systems such as detention ponds where the discharge is a shallow concentrat-



ed flow that leaves the facility and enters waters of the State either directly or through a separate storm sewer system (MS4). The Permittee shall collect a discharge sample post BMP treatment, or at the property line (if the discharge is in a ditch), pipe or catch basin, before it discharges into waters of the State.

- 3.6. **Municipal Separate Storm Sewer System.** Means conveyances for stormwater, including, but not limited to, roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels or storm drains (other than publicly owned treatment works and combined sewers) owned or operated by any municipality, sewer or sewage district, Maine Department of Transportation, Maine Turnpike Authority, State agency or Federal agency or other public entity that ultimately discharges directly to waters of the State other than ground water.
- 3.7. **STORMWATER POLLUTION PREVENTION PLAN (“SWPPP”).** A written plan developed and implemented by each permittee. This plan evaluates potential pollutant sources, and when properly implemented, reduces or eliminates pollutants that may come in contact with stormwater.

4. RESPONSIBILITIES.

- 4.1. **MONITORING PROGRAM IMPLEMENTATION.** The Permittee shall prepare and document monitoring procedures and frequencies for conducting benchmark, numeric, & impaired waters monitoring in the facility’s SWPPP.
- 4.2. **OUTFALL IDENTIFICATION.** The permittee shall identify each outfall subject to effluent monitoring at the facility. All outfalls must be uniquely identified on the facility’s site map. The mapped outfalls must correspond with the written text of the SWPPP.
- 4.3. **EMPLOYEE TRAINING.** The permittee is responsible for ensuring that all facility personnel involved in effluent sampling are properly trained in sample collection procedures. Staff involved in sampling shall be familiar with the site map, physical outfall locations, and the approximate amount of time it takes each basin/drainage area to produce a measurable discharge based on storm intensity. Personnel involved in sampling should also be trained in all facility safety procedures as they apply to sampling. The same individual, whenever practicable should carry out the collection of discharge samples for the entire permit term. Written documentation certifying that all personnel involved in sampling have been properly trained must be maintained on-site with the SWPPP.
- 4.4. **SAMPLE COLLECTION FREQUENCY.** Numeric monitoring shall be conducted annually for the permit term as outlined in the permittee’s Sector. For any numeric limit exceedance the permittee must meet the requirements outlined in Special Condition N(5) of the MSGP. The permittees subject to benchmark monitoring shall conduct benchmark monitoring quarterly for the first four full calendar quarters of coverage under the MSGP. When conditions prevent the permittee from obtaining four samples in four consecutive quarters, the permittee must continue monitoring until the four samples are collected. After collection of four quarterly samples, calculate the average value for each parameter from the quarterly samples. This will yield an average monitoring value for each parameter. If the average of the four quarterly samples for any pa-



parameter does not exceed the effluent limitation, the benchmark monitoring requirements are fulfilled for those parameters for the permit term. If the average of the four quarterly samples exceeds the benchmark limit for any parameter the permittee shall meet the requirements outlined in Special Condition N(4)(c) of the MSGP.

- 4.5. **RECORD KEEPING AND REPORTING.** The permittee shall maintain records of all analytical effluent monitoring information in accordance with the requirements set forth in Special Condition P of the MSGP. In addition to the laboratory analyses, chain of custody copies must be maintained on site with the SWPPP.

5. PROCEDURES

- 5.1. **SAMPLE COLLECTION TIMING.** A grab sample must be collected from each outfall subject to effluent monitoring during a qualifying storm event. For Log watering or mine dewatering activities outlined in Sectors A & J, samples must be collected during the non-stormwater discharge event at point of discharge. Collect the grab sample during the first **sixty (60) minutes** of the discharge if possible. Samples must be collected no later than 2.25 hours after runoff begins discharging from an outfall. The permittee and designated SWPPP team member shall know the approximate amount of time, based on storm intensity, that it takes each outfall's drainage area/basin to produce a measurable discharge from the outfall.
- 5.2. **SAMPLE CONTAINER CLEANING AND PREPARATION.** The facility must have an adequate supply of containers prepared for sample collection. Most certified laboratories can provide clean sample containers, preservatives, sealing, chain of custody and can provide further advice on sample preservation, hold time shipping and handling. Permittees must check with the laboratories to verify if they are accredited for each testing method required.
- 5.3. **SAMPLE COLLECTION.** Samples for analytical effluent monitoring must be collected and preserved in containers specified by a certified laboratory or in method consistent with 40 CFR Part 136. Minimum sample volumes, preservation techniques, and hold times vary depending on the pollutant parameter to be measured; therefore familiarity with 40 CFR Part 136 is essential to ensure correct collection, preservation, and timely analysis. It is also important to verify that the preservation technique for one parameter does not affect the analytical results of another in the same sample. If this is the case, a sufficient number of samples for all required analyses should be collected from the same outfall and preserved accordingly. Additionally, the required number of de-ionized water blanks shall be collected if required by the appropriate EPA test method(s) used to measure the required pollutant parameters.
- 5.4. **BENCHMARK MONITORING TEST METHODS.** For sectors requiring benchmark analysis for Total Petroleum Hydrocarbons (TPH), the permit holder may use US EPA Method 8015 or US EPA method 1664 to meet the permit requirements. Also, it is acceptable to use pH strips for conducting benchmark monitoring as long as there are no exceedances. In addition, the use of a handheld pH meter with a three point calibration is acceptable for benchmark pH sampling. Proper field notes including calibration details must be kept.



- 5.5. **REPRESENTATIVE OUTFALLS.** If the facility has two (2) or more outfalls within a single drainage area that are anticipated to discharge substantially similar pollutants resulting from similar industrial activity(s), practices, or materials, the permittee may test the effluent of just one of the outfalls during a sampling period, provided that subsequent samples are taken from a different outfall(s) within the representative outfalls' drainage area during each successive monitoring event or period. For this to be permissible the permittee must follow the instructions for sampling from representative outfalls set forth in Special Condition B(15) of the MSGP.
- 5.6. **GRAB SAMPLE COLLECTION.** Grab samples must be collected by inserting a container under or downstream of a discharge with the container opening facing upstream. In most cases the sample container may be hand held while the sample is collected. Less accessible outfalls may require the use of poles or buckets to collect grab samples. Collect the grab from the horizontal and vertical center of the outfall. If sampling in a channel, (e.g., ditch, trench, rill) avoid stirring up bottom sediments and avoid sampling from still water. Avoid touching the inside of the container to prevent contamination. Transfer sample to the approved laboratory container. Do not use containers or transfer from containers which have not been cleaned specifically for collecting lab samples.
- 5.7. **SAMPLE IDENTIFICATION AND LABELING.** Prior to shipping samples for analysis, a Water-proof, gummed sample identification label or tag should be attached to the sample collection container. This label should contain the following information.
- Facility name
 - Name of the sample collector
 - Sample identification number and outfall
 - Date and time of sample collection
 - Type of analysis required
 - Location of sample collection
 - Preservatives used
 - Type of sample (grab or composite)
- 5.8. **CHAIN OF CUSTODY PROCEDURES.** Once samples have been collected, the permittee or designated responsible party shall create a chain of custody. The chain of custody documents the following information for all samples collected.
- Sample identification number(s)
 - Date and time of sample collection
 - Source of sample and location of sample collection
 - Name of sampling personnel
 - Sample type (composite or grab)
 - Preservation used
 - Analysis required
 - Name and signatures of all persons handling the samples in the field and laboratory.



The chain of custody must be included with the samples during shipment to the laboratory. When transferring possession of samples, the transferee shall sign and record the date and time on the chain of custody. Each person who takes custody of the samples shall fill in the appropriate section of the chain of custody record.

- 5.9. **SAMPLE PACKING AND SHIPPING.** All samples collected must be packed and shipped in accordance procedures outlined with a certified laboratory. See also 40 CFR Part 136 and 49 CFR Parts 171-177.
- 5.10. **SOLUTIONS TO SAMPLE LOCATION PROBLEMS.** Contact your Industrial Stormwater Inspector for solutions to sample location problems.

6. REFERENCES

- 6.1. **STATE OF MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION MULTI-SECTOR GENERAL PERMIT for Stormwater DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY** Maine Department of Environmental Protection, Bureau of Water Quality, Waste Discharge License # W-008227-MN-C-R (December 2016)
- 6.2. **GUIDANCE MANUAL FOR THE MONITORING AND REPORTING REQUIREMENTS OF THE NPDES MULTI-SECTOR STORM WATER GENERAL PERMIT**
United States Environmental Protection Agency, Office of Water (EN-336), EPA 833-B-99-001(January, 1999)
- 6.3. **NPDES STORM WATER SAMPLING GUIDANCE DOCUMENT**
United States Environmental Protection Agency, Office of Water (EN-336), EPA 833-8-92-001 (July, 1992)



Table 1: Required Parameters and Numeric Limitations for Facilities Subject to Effluent Monitoring under the Maine MSGP Please see individual Sectors for further guidance.

MSGP Sector	SIC/Activity Code(s)	Regulated Activities	Required Parameters	Numeric Limitation
A	2411	Wet decking discharge at log storage & handling facilities	pH	6.0-9.0 s.u.
			Debris (woody material such as bark, twigs, branches, heartwood, or sapwood)	No debris that can pass through a 2.54-cm (1") diameter round opening
C	2874	Runoff from phosphate fertilizer manufacturing facilities that comes into contact with any raw materials, finished products, by-products or waste products	Total Phosphorus (as P)	105.0 mg/L daily max 35 mg/L 30-day avg.
			Fluoride	75.0 mg/L daily max 25.0 mg/L 30-day avg.
D	2951-2952	Discharges from asphalt emulsion facilities	TSS	23.0 mg/L daily max 15.0 mg/L 30-day avg.
			Oil and Grease	15.0 mg/L daily max 10 mg/L 30-day avg.
			pH	6.0-9.0 s.u.
E	3241	Discharges from material storage piles at cement manufacturing facilities	TSS	50.0 mg/L daily max
			pH	6.0-9.0 s.u.
H	1221-1241	30 cubic yards or more of coal storage onsite	TSS	50 mg/L max
			pH	6.0-9.0 s.u.
J	1422-1429	Mine dewatering discharges at crushed stone mining facilities	pH	6.0-9.0 s.u.
	1442	Mine dewatering discharges at construction sand and gravel mining facilities	pH	6.0-9.0 s.u.
	1446	Mine dewatering discharges at industrial sand mining facilities	TSS	25 mg/L monthly avg. 45 mg/L daily max



			pH	6.0-9.0 s.u.
K	HZ	Contaminated storm-water discharges from hazardous waste landfills subject to effluent limitations in 40 CFR Part 445 Subpart A	BOD ₅	220 mg/L daily max 56 mg/L monthly avg.
			TSS	88 mg/L daily max 27 mg/L monthly avg.
			Ammonia	10 mg/L daily max 4.9 mg/L monthly avg.
			Alpha Terpineol	0.042 mg/L daily max 0.019 mg/L monthly avg.
			Aniline	0.024 mg/L daily max 0.015 mg/L monthly avg.
			Benzoic Acid	0.119 mg/L daily max 0.073 mg/L monthly avg.
			Naphthalene	0.059 mg/L daily max 0.022 mg/L monthly avg.
			p-Cresol	0.024 mg/L daily max 0.015 mg/L monthly avg.
			Phenol	0.048 mg/L daily max 0.029 mg/L monthly avg.
			Pyridine	0.072 mg/L daily max 0.025 mg/L monthly avg.
			Total Arsenic	1.1 mg/L daily max 0.54 mg/L monthly avg.
			Total Chromium	1.1 mg/L daily max 0.46 mg/L monthly avg.
			Total Zinc	0.535 mg/L daily max



				0.296 mg/L monthly avg.
			pH	6.0-9.0 s.u.
L	LF	Contaminated storm-water discharges from non-hazardous waste landfills subject to effluent limitations in 40 CFR Part 445 Subpart B	BOD ₅	140 mg/L daily max 37 mg/L monthly avg.
			TSS	88 mg/L daily max 27 mg/L monthly avg.
			Ammonia	10 mg/L daily max 4.9 mg/L monthly avg.
			Alpha Terpineol	0.033 mg/L daily max 0.016 mg/L monthly avg.
			Benzoic Acid	0.12 mg/L daily max 0.071 mg/L monthly avg.
			p-Cresol	0.025 mg/L daily max 0.014 mg/L monthly avg.
			Phenol	0.026 mg/L daily max 0.015 mg/L monthly avg.
			Total Zinc	0.020 mg/L daily max 0.11 mg/L monthly avg.
O	SE (SE is an activity code(i.e., non-SIC designation) for this Sector. It may apply to any facility/SIC in addition to SIC 4911)	Discharges from coal storage piles at Steam Eclectic Generating Facilities	TSS	50 mg/L
			pH	6.0-9.0 s.u.



Table 2: Required Parameters and Benchmark Limitations for Facilities Subject to Benchmark Monitoring under the Maine MSGP. Please see individual Sectors for further guidance.

MSGP Sector	Subsector	Required Parameters	Benchmark Limitation
A	A1, A3-A5	TSS	100 mg/L
		pH	6.0-9.0 s.u.
	A2	Total Arsenic	0.15 mg/L
		Total Copper	0.0038 mg/L
B	B1	TSS <i>or</i> COD	100 mg/L <i>or</i> 120 mg/L
		pH	6.0-9.0 s.u.
		N	N1
		pH	6.0-9.0 s.u.