

# Draft Monitoring Matrix

Matrix of monitoring objectives and sampling requirements that provides a more informative way to develop monitoring requirements

*Monitoring Approach - increasing complexity and effort* →

- Increasing complexity in sample type from limited grab samples to flow weighted samples
- Increasing effort that improve understanding of mass loads
- Increasing effort to understand impact to streams, constituent balance

Objective \ Question	Visual Site Assessment	Grab Sampling of Stormwater					Flow Weighted Sampling of Stormwater			Sampling Includes Points Upstream and/or Downstream of Facility Discharge			
	Photo Point Monitoring (designed to demonstrate housekeeping)	Selected Facilities- Parameters, Seasonal Grab (MSGP)	Single Grab, Select Parameters, All Facilities, Seasonal	Broad Screening (i.e. large number of parameters), Multiple Sites, Limited Frequency	Random, or Stratified (e.g. consortium), Random Sample, Grab samples	Multiple Grab (representative of event), Physical Composite, consortium opportunity	Flow Weighted Composite Samples (once parameters selected)	Designed BMP Program (e.g. above -below BMP), Flow Weighted, could be cooperative	Ambient Grab Samples coincident with discharge, location representative of discharge impact	Above - Below Discharge, flow or event weighted, average concentration, representative sampling (e.g. mixing distance)	Constituent balance (flow) [C], flow weighted composite, explicit time, discharge, receiving water	Constituent balance (flow) [C], flow weighted composite, explicit time, fate and transport, receiving water, for individual sources	
<b>Characterize Runoff</b>													
Identify pollutant presence or absence for a suite of pollutants in industrial stormwater	C to E (P)	C	C	C to E	C to E	E	E+	E			E	E	
Compare/contrast relative pollutant concentration in industrial stormwater to other sources of urban runoff and/or natural runoff		L-	L-	L-	L-	C	E	E			E	E	
Characterize the relative contribution of industrial land use stormwater in a basin			L-	L- (P)	L-	C	C <sup>m</sup>	E			E (P)	E (P)	
Determine the relative contribution of several individual facilities where multiple sources to common conveyance		L-	L-	L- (P)	L-	C		E	C	C	E (P)	E (P)	
<b>Initiate Action</b>													
Determine stormwater quality relative to benchmark for a source		C	C	C	C	E-	E+	E			E	E	
Establish if a stormwater source has a likelihood of exceeding water quality standards based on statistically determined number of samples	C to E		L-	L-	L-	C to E-	E	E	C	C	E	E	
Determine compliance with water quality standards - single event										C	E	E	
Quantify the contribution of a single source to a water quality limited stream segment		L-	L-	L-	L-	C	E	E	C	C	E	E	
<b>Trends and future permit conditions</b>													
Determine if stormwater quality is changing over time at an individual facility					C	C	E <sup>design</sup>	E		C	E	E	
Determine if stormwater quality is changing over time from industrial land uses					C	C	E <sup>design</sup>	E		C	E	E	
Evaluate effectiveness of BMP on pollutant loads								E <sup>design</sup>		C	E (P)	E (P)	
Determine impact of industrial stormwater to receiving water quality							E <sup>design</sup>	E <sup>design</sup>		C	E	E	

**Field Designations-** suitability of addressing objective

**E** - Effective monitoring strategy

**C** - Course monitoring strategy, may provide some insight

**L** - Limited situation may provide some insight

**P** - Possible

Blank fields - monitoring strategies are not suitable to address objectives

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**Abbreviations**

**m** - Could be used if event mean developed and assumed (modeled) runoff used.

**s** - For selected parameters without need to know how representative the grab sample is of runoff; high potential for errors.

**design** - Would have to implement statistical design (seasonal Kendal) for limiting variation between events and including adequate number of samples.

**Note:** Some monitoring approaches may work best involving a consortium strategy to cooperate on a designed study (e.g., boatyards in Washington)