

Visual and Analytical Storm Water Monitoring for Marinas

Basic guidance for marina operators to satisfy the quarterly visual and annual analytical monitoring requirements of Ohio EPA's NPDES marina storm water general permit.

Purpose

Federal storm water regulations (40 CFR 122.26(b)(14)) identify marinas as an industrial category subject to National Pollutant Discharge Elimination System (NPDES) storm water permitting. Marinas with standard industrial classification (SIC) code 4493 involved in boat maintenance activities (including boat rehabilitation, mechanical repairs, painting, fueling and lubrication) or equipment cleaning operations are subject to Ohio EPA's NPDES general permit for storm water discharges associated with industrial activity from marinas. This general permit, OHRM00002, applies to all of Ohio. SIC code guidance is available at epa.ohio.gov/dsw/permits/GP_Marinas.aspx.

Where to sample?

Using your site map, determine where the runoff from the industrial activity drainage areas discharges from your facility.

The marina storm water general permit requires monitoring at each storm water outfall draining areas where the industrial activities are exposed to precipitation (for example, a storm water outfall draining a parking lot where boat maintenance activities are performed). Make sure your sampling locations sample only the storm water that comes from your facility. If the storm water in a pipe (storm sewer) contains other discharges, try to move your sampling point to where the flow is from your facility only.

The following are some examples of mixed water source situations that you should not sample.

- A common ditch that carries storm water from properties upstream. In this case, the storm water from your facility is mixed with other water. You should find a location or locations where your facility's storm water alone can be sampled.
- A partially submerged storm sewer pipe where it discharges into the receiving water body. In this case, this final discharge point should not be used as a sampling point because the storm water flow is mixed with the receiving water.
- A manhole that carries storm water not only from your facility but from other storm water sources as well. If you are taking a grab sample from a manhole, make sure that the flow in that pipe is entirely from your facility.



Site map

The marina storm water general permit requires that marinas have a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP includes a site map that identifies rain event drainage areas, industrial activities in each drainage area, and the locations of all storm water outfalls.

The site map should show the locations where the following industrial activities are exposed to precipitation:

- fueling;
- engine maintenance and repair;
- vessel maintenance and repair;
- boat washing;
- painting;
- sanding and/or blasting;
- welding and/or metal fabrication;
- loading/unloading areas;
- locations for storage of wastes;
- liquid storage areas (such as for paint or solvents); and
- material storage areas (for example, for blasting media).

Note: SWPPP conditions/requirements are found in the marina general permit.

Visual and Analytical Storm Water Monitoring for Marinas

As mentioned earlier, it is important to sample flow from only your facility or the sample will not be representative of the area you are monitoring. If your storm water discharge merges with discharges from other facilities/sources, you should attempt to sample at a point before your storm water mixes with storm water from other sources. However, if storm water runs onto your property in an uncontrolled fashion (for example, sheet flow) from adjacent property, into areas of industrial activity on your site, this would be included in your sample of storm water discharge.

If you are concerned about this offsite source, you may want to sample that storm water where it enters your property. If the results show significant pollution, maintain a narrative description of the contributing site and sample results to document the contribution of the other property or upstream source.

What is a representative discharge?

When a marina has two or more storm water discharge outfalls, it may not be necessary to sample every discharge point. The marina storm water general permit contains a representative discharge provision. This is a means of reducing the number of outfalls that must have quarterly visual inspections and annual analytical monitoring conducted.

Representative discharge is based on consideration of industrial activity, and management practices and activities within the outfall drainage areas.

If a marina reasonably believes that the discharge is substantially identical at two or more outfalls, it may conduct the monitoring requirements on one outfall and document that the data also applies to the substantially identical outfall(s).

Marinas that conclude that they have representative discharge(s) must include a description of the location of the outfalls and an explanation of why the outfalls are substantially identical in the SWPPP. Marinas do not need Ohio EPA approval to claim discharges are representative, provided they have documented their rationale in the SWPPP.

How to sample

The marina storm water general permit requires that grab samples be taken for both the visual and analytical monitoring requirements. Visual monitoring does not require laboratory analysis. A grab sample is a single sample “grabbed” by filling up a container, either by hand or with the container attached to a pole. It is the simplest type of sample to collect.

Some good sample collection practices are:

- If using gloves for personal protection use powder-free latex or vinyl gloves.
- For analytical samples, collect samples with the storm water flowing directly into bottle(s) supplied by your lab. Avoid transferring the water sample from a container that may not be clean.
- For visual samples, simply take the grab sample in a clean, clear bottle.
- When holding the sample bottle, keep your hands away from the opening. This will prevent contamination of the sample.
- Hold the bottle with its mouth facing upstream (into the flow of the water). The water flows directly into the bottle and not over the bottle or your hands.
- Sample from a central portion of the storm water flow. Avoid touching the bottom of channels or pipes so as not to stir up solid particles (sediment).
- When the sample is collected, cap the bottle and make sure it is labeled.
- For analytical monitoring grab samples, follow instructions provided by your lab.

Who should sample?

To be most effective, the marina personnel conducting the quarterly visual and annual analytical monitoring should be members of the facility’s pollution prevention team. These individuals should be knowledgeable about the SWPPP, the sources of on-site contaminants, the industrial activities exposed to storm water, and the day-to-day operations that may cause unexpected pollutant releases.

Visual and Analytical Storm Water Monitoring for Marinas

When to sample

The marina storm water general permit requires that the grab samples be taken from a “measurable storm event.” A measurable storm event is one that results in an actual discharge from the facility and that occurs at least 72 hours after the previously measurable storm event. Grab samples need to be collected within the first 30 minutes (or as soon thereafter as practical, but not to exceed one hour) of when the runoff or snowmelt begins discharging from the facility during a measurable storm event.

Monitoring waivers

The marina storm water general permit contains two waivers from the monitoring requirements. Marinas are not required to obtain advance approval for monitoring waivers.

Adverse weather conditions waiver

Applicable for both the quarterly visual and annual analytical monitoring requirements. The marina storm water general permit allows for temporary waivers from sampling based on unusual adverse climatic conditions. This temporary sampling waiver is only intended to apply to insurmountable weather conditions like drought or dangerous conditions such as lightning, flash flooding or tornados. These events tend to be isolated incidents and may not be used as an excuse for never conducting the monitoring requirements. In lieu of monitoring data the marina would need to provide a description of why samples could not be collected for that quarter (visual monitoring) or that year (analytical monitoring) and maintain with your SWPPP.

Inactive and unstaffed site waiver

Applicable for the quarterly visual monitoring requirement. The marina storm water general permit allows for a waiver of the quarterly visual monitoring requirements if the facility is inactive and unstaffed for a particular monitoring quarter(s), provided that no industrial materials or activities are exposed to storm water. If this waiver is exercised, the permittee needs to maintain a certification with the SWPPP that the site is inactive and unstaffed, and there are no industrial materials or activities exposed to storm water for the particular quarter(s).

Visual monitoring requirements

All marinas covered under the marina storm water general permit are required to perform quarterly visual monitoring of their storm water outfalls. The quarterly visual monitoring is intended to provide a useful and inexpensive means for facilities to evaluate the effectiveness of their SWPPP. Visual monitoring does not involve laboratory analysis.

The following guidelines apply when conducting visual monitoring requirements.

- Conduct on a quarterly basis. Quarters correspond to the three-month intervals beginning in January, April, July and October.
- Take grab sample during the first 30 minutes (or as soon thereafter as practical, but not to exceed one hour), when the runoff or snowmelt begins discharging from the facility during a measurable storm event.
- Collect the grab sample in a clean, clear bottle at each outfall associated with industrial activity.
- Examine the grab sample in a well-lit area. The visual examination shall document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen and other obvious indicators of storm water pollution.
- Maintain the documents that summarize these quarterly visual storm water examinations on site with the SWPPP. The Template Marina SWPPP contains a worksheet to summarize these examinations and is available online at epa.ohio.gov/dsw/permits/GP_Marinas.aspx.
- Whenever practical, the same individual should carry out the collection and examination of visual grab samples throughout the life of the permit to ensure the greatest degree of consistency possible in recording observations.

When conducting a storm water visual examination, the pollution prevention team or team member should attempt to relate the results of the examination to potential sources of storm water contamination on the site. See the table on the following page for an example.

Visual and Analytical Storm Water Monitoring for Marinas

Observation	Action
Oil sheen.	Conduct an inspection of the area of the site draining to the sample collection point. Look for obvious sources of spilled oil, leaks, etc. If a source can be identified, this information allows the facility operator to immediately clean up or remove the source of the oil.
Floating solids seen on visual examination.	Examine the solids to see if they are raw materials, waste materials, or other known products stored or used at the site.
Unusual color or odor detected.	Attempt to compare the color or odor to the colors or odors of known chemicals and other materials used at the facility.
Large amount of settled solids.	Check unpaved unstabilized areas or areas of erosion.
Cloudy sample – very slow to settle out.	Evaluate the site draining to the discharge point for fine particulate material, such as dust, ash, or other pulverized, ground, or powdered chemicals.
Clean and clear sample of storm water discharge.	This may indicate a high quality result. However, the visual examination will not provide information about dissolved contamination.

Ohio EPA believes that this quick and simple assessment will help marinas determine the SWPPP effectiveness on a regular basis at very little cost. Although the visual examination cannot assess the chemical properties of the storm water discharged from the site, the examination will provide meaningful results upon which the facility may act quickly.

This hands-on examination will enhance the staff's understanding of the site's storm water problems and the effects of the management practices that are included in the SWPPP.

Analytical monitoring requirements

In addition to quarterly visual monitoring, the marina storm water general permit requires marinas that have 200 or more boat slips (total boat capacity including wet and dry), to perform annual analytical monitoring for total recoverable aluminum; total recoverable iron; total recoverable lead; total recoverable zinc; and total suspended solids (TSS). Follow these procedures when conducting the annual analytical monitoring.

- Perform annually during active operation of the marina.
- Select a lab to perform the tests. The lab will provide you with sampling bottles and instructions.
- Take a grab sample during the first 30 minutes (or as soon thereafter as practical, but not to exceed one hour) of when the runoff or snowmelt begins discharging from the facility during a measurable storm event.
- A member of the pollution prevention team should take a grab sample in the bottles provided by your lab at each outfall associated with industrial activity.
- Follow the instructions provided by the lab about preserving your samples and getting to the lab.
- Maintain the documents and reports that summarize the annual analytical monitoring results on site with the SWPPP. Ohio EPA's Template Marina SWPPP contains a worksheet to summarize these analyses.
- Whenever practical, the same individual should carry out the collection of the annual analytical grab samples throughout the life of the permit to ensure the greatest degree of consistency possible.

To aid in assessing SWPPP effectiveness, marinas should compare their analytical monitoring results to the benchmark concentrations shown in the table to the right. The concentrations will give a marina a good benchmark to compare their analytical results. If your lab results exceed the benchmark values, you should evaluate your SWPPP to determine whether it includes all appropriate best management practices (BMPs) to eliminate or reduce the pollutant of concern. Unless requested, the results of the analytical monitoring do not need to be submitted to Ohio EPA; instead, maintain the results with your SWPPP.

Parameter	Benchmark Concentration
Total Recoverable Aluminum	0.75 mg/L
Total Recoverable Iron	1.0 mg/L
Total Recoverable Lead	0.26 mg/L
Total Recoverable Zinc	0.26 mg/L
Total Suspended Solids (TSS)	100 mg/L

Visual and Analytical Storm Water Monitoring for Marinas

Finding a laboratory

The annual analytical monitoring requirements require the services of a lab. You should contact the lab well in advance and describe the parameters to be analyzed. The lab will provide you with sampling bottles and instructions. Discuss with the lab that they will need to use test procedures approved under 40 CFR Part 136. A list of labs that may be able to analyze your samples is available at epa.ohio.gov/portals/28/documents/labcert/chemlabs.pdf. You may also check your local yellow pages.

More information

This guidance document is not intended to provide in-depth guidance on visual and analytical monitoring for all scenarios and situations. It was developed to provide an introduction to the basics of satisfying the marina storm water general permit's monitoring requirements.

Additional information and guidance about Ohio EPA's NPDES general permit for storm water discharges associated with industrial activity from marinas is available online at epa.ohio.gov/dsw/permits/GP_Marinas.aspx.

Any questions about this guidance document or the requirements of the general permit can be directed to Anthony Robinson, Central Office Storm Water Section, at anthony.robinson@epa.ohio.gov or by calling (614) 728-3392.