



Ambient Monitoring Guidance

Guidance for NPDES permittees on receiving water monitoring

The Oregon Department of Environmental Quality is providing information to help NPDES permittees develop and implement monitoring plans with accurate data and documented quality for permit limits. It is not intended to be a comprehensive resource, but it does address the most frequently asked questions. For additional information, refer to the sources and contact information at the end of the document.

1. Why do I need to monitor my receiving water?

When DEQ determines that there may be effluent pollutant concentrations that exceed water quality criteria, DEQ may require the permittee to further characterize the effluent and ambient receiving waters in order to determine site specific conditions for NPDES permitting purposes. DEQ will use the information to determine whether or not the discharge has the potential to exceed water quality standards in the receiving water body. If there is reasonable potential, DEQ will use the data to develop water quality based effluent limits.

It is the responsibility of the permittee to ensure that the data collected is of good quality, is taken in a representative location, and that safety procedures are followed for sample collection.

2. Should I develop a monitoring plan for sampling ambient water?

Yes. Having a Quality Assurance Project Plan is a permit requirement (see Schedule B of your permit). A QAPP template is available at <https://www.oregon.gov/deq/wq/wqpermits/Pages/Forms.aspx> ([Template for Quality Assurance Project Plan and Sample Analysis Plan](#)). Note that the use of this template is recommended, but not required. It is especially important to include the following:

- A. Identification of persons who will be involved with sample collection and testing. Note: DEQ encourages collaboration among permittees where opportunities exist for multiple permittees to use the same ambient data.
- B. List of pollutants of concern with associated quantitation limits, detection limits, precision, analytical methods (use 40 CFR 136 approved methods), and holding times.
- C. Identification of sampling location(s) which include both coordinates, description of location, and photographs.
- D. Sampling schedule.
- E. Sample collection, preservation, handling, and transport protocols.

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- F. Qualification and training of the sample collectors and analytical laboratory Note that use of accredited laboratories is not legally required for wastewater and ambient water analyses, but is strongly recommended. A laboratory search tool is available at: <https://lams.nelac-institute.org/Search>).
- G. The frequency of collecting quality control samples to assess data bias, precision, and contamination (control samples, spiked samples, field and laboratory blanks, and duplicates. See Item 5 below).
- H. The criteria for accepting, qualifying, and rejecting data based on QC sample results.
- I. Provisions for electronically storing sample and QC data, and electronically submitting data to DEQ.
- J. Schedule for data submission to DEQ (see your NPDES permit or monitoring request letter).

3. Where should samples be collected?

The monitoring site should be a representative location upstream of the outfall. Ideally it will have the following characteristics:

- A. The site is sufficiently far upstream of the outfall that samples do not include effluent. If the receiving stream is stagnant or has complex or turbulent flow patterns, putting dye into the effluent may help identify the effluent plume to avoid sampling within the plume.
- B. The site is located near the center of the stream, in a well-mixed area away from back eddies, tributaries, or stratified areas. Ideally, it should be located downstream of turbulent reaches such as riffles.
- C. The site is not located near a stormwater or other outfall or sources of nonpoint source pollution such as eroding banks.
- D. The site is not located near roadways, metal supports, wires or poles as these may introduce contamination.
- E. Ideally the site can be sampled from the shore using a sample container fastened to an extending pole. If this is not possible (e.g. the stream is too large, no access from shore), other options for collecting samples are as follows, in order of most to least preferable:
 - a. From a boat with sample container fastened to an extending pole. Sample should be collected from the bow with the boat pointed upstream.
 - b. Instream via wading. Wader should collect sample upstream of where standing with sample container fastened to an extending pole.
 - c. From a bridge with sample containers placed inside a bucket with a rope.
 - d. In the case of high bridges, via peristaltic pump.
- F. If samples must be collected from a bridge, the following measures will help limit the possibility of contamination:
 - a. Schedule sampling events during periods of low traffic.
 - b. Avoid disturbing debris on bridges when raising and lowering sampling apparatus.

DEQ recommends reviewing the desired sampling location using an online mapping tool to ensure that there are no nearby sources of potential contamination (see item B above) and to also visit the location in person prior to final selection of location. The permittee should ensure that the sampling location is publicly accessible or obtain the necessary permissions from the landowner.

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4. What are some recommended sampling practices?

DEQ recommends the following:

- A. If sampling from a bridge, place the sample bottles in a bucket. Other considerations when using buckets are as follows:
 - a. Metal buckets should not be used when sampling for metals. A plastic bucket or trace metal sampling device should be used instead.
 - b. If sampling for toxics other than metals, the bucket should be made of stainless steel.
 - c. If sampling for conventional parameters (BOD, TSS, oil and grease, bacteria and pH) and nonconventional parameters (ammonia, nitrate-nitrite, phosphorus and dissolved orthophosphate), a plastic bucket may be used.
 - d. Collect the sample by submerging the bottles (plus bucket if using one to hold the sample bottles) well below the water's surface. This will help prevent boundary layer contamination.
- B. The following practices will help reduce the possibility of contamination:
 - a. Keep sampling equipment and workstation area clean.
 - b. Wear non-powdered gloves when collecting samples.
 - c. Prior to collecting a sample, field-clean sample bottles by submerging them into the river and emptying again.
 - d. When sampling from a boat, position the boat so it faces upstream and collect samples from the bow.
- C. The following practices apply when sampling for dissolved metals:
 - a. If collecting samples in bottles, transport the sample bottle to the workstation and decant 250 mL of the sample and filter using a certified trace metal clean filter.
 - b. If using a peristaltic pump, place the suction line from the pump into the collection bottle.
 - c. Note that 40 CFR 136 requires that samples be filtered within 15 minutes of collection.
- D. Other considerations include the following:
 - a. Add the appropriate preservative, if required.
 - b. Place samples on ice as soon as they are collected and store in a secure location to preclude conditions which could alter the properties of the sample.
 - c. Fill out the chain of custody form.

5. Does DEQ recommend the use of blanks and duplicates?

Yes. The use of blanks and duplicates document the bias and precision of the results, help ensure that samples are free of contamination and that results are reproducible. It is the responsibility of the permittee to ensure that the data collected is of good quality. Here is more detail on the various types of blanks that may be run:

- **Trip/transport blank** – used when testing for VOCs. A trip or transport blank is a bottle of lab water that is brought to the field and returned unopened to the lab and tested in the same fashion as field samples. If the trip or transport blank is found to contain VOCs, the sample may be contaminated.
- **Equipment blank** – an equipment blank is a blank collected by running laboratory de-ionized water through the sampling equipment and collecting as a sample. This type of blank is used to determine if the intermediate sampling equipment (such as a bucket or filter) may be introducing contamination into the sample. This can be important for metals, especially dissolved.
- **Field blanks** – a field blank is a sample of water that is brought from the lab to the field and is treated the same way that samples are treated. If contaminants are detected in the field blank, there may be contamination from field conditions.

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- **Duplicates** – duplicates are samples that are collected at the same time and tested for the same parameters. They are used to confirm that sampling procedures give the same result each time.

It is in the best interest of the permittee to collect blanks and duplicates especially when monitoring for pollutant parameters commonly associated with cross contamination such as mercury or bis (2-ethylhexyl) phthalate.

6. What about chain-of-custody procedures?

Chain-of-custody procedures help ensure the integrity of samples from collection to disposition. Here are some typical chain-of-custody procedures:

- Field sampling events are documented in a bound logbook.
- Samples are shipped in conformance with U.S. Department of Transportation rules of shipment. See the following for more information:
 - Title 49 of the Code of Federal Regulations (49 CFR parts 171 to 179)
 - International Air Transportation Association hazardous materials shipping requirements. These may be found in the current edition of IATA's Dangerous Goods Regulations.
- All shipping documents, such as air bills, bills of lading, etc., are stored in a secure place.

7. How should the results be reported to DEQ?

Schedule B of your permit contains reporting requirements. Any monitoring request letters from DEQ will include directions on how to submit data. Toxics and Copper BLM results should be reported using DEQ's Electronic Data Delivery system. More information is available at:

<https://www.oregon.gov/deq/wq/wqpermits/Pages/Electronic-Data-Delivery-for-Toxics-Data.aspx>.

For EDD submissions to be considered you must include:

- excel spreadsheet of the data
- pdf copy of the lab report
- chain of custody.

8. What are some other references on monitoring that may be helpful?

For additional information, consult the following:

[Surface Water Sampling SOP - EPA Region 4](#)

[Surface Water Sampling SOP – EPA Region 9](#)

[Surface Water Sampling SOP – EPA Region 8](#)

[Surface Water Sample and Data Collection – USDA, Forest Service](#)

[Collection of Water samples - USGS](#)

Note: these documents were written by different parties for different needs and there may be instances in which they contradict each other.

Contact

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