

Solid waste sampling and analysis protocol guidance

For solid waste facilities that have water quality monitoring, the facility owner or operator must develop a written monitoring protocol. The following guidance includes the topics that should be covered in the sampling and analysis protocol (SAP) for compliance monitoring.

- A written copy of SAP must be kept for the facility and followed during sampling and sampling analysis. [7035.2815, subp. 14 (G)]
- The SAP must be approved and included in a section of the operations manual. [7035.2815, subp. 14 (G)]
- The SAP must be reviewed at least annually by the owner or operator, sampling personnel, and analytical laboratory and revised as needed. [7035.2815, subp. 14 (G)]
- Revisions of the SAP must be submitted upon written request or as specified in the facility permit, order, or stipulation agreement. The SAP must be revised immediately to reflect any changes in the monitoring system, field or analytical procedures, sampling personnel, or analytical laboratory. [7035.2815, subp. 14 (G)]
- Dated records of past SAP language must be retained throughout the operating life of the facility and the postclosure period. [7035.2815, subp. 14 (G)]

General

- Names and contact information of project personnel including roles and responsibilities
- Brief site description and operational history
- Area and site geology and hydrogeology
- Data quality objectives (DQOs)
 - A general discussion should be included that documents:
 - The purpose of the SAP
 - Sample collection timeframes, frequency, and analytes to be evaluated
 - Quality control acceptance criteria (may include reference to lab table(s) included in the document)
 - Specific limits that data will be compared to
 - Steps that will be taken if data are found to exceed the specified limits
- Signature Page including:
 - Project title with site name
 - Printed name, title, company or agency, signature, and signature date of the environmental consultant; property owner or operator; and laboratory manager or laboratory quality assurance manager

Sampling

- Sample collection must be done by trained personnel. [7035.2815, subp. 14 (F)]
- Map showing location of sampling points and the compliance boundary

- Table(s) of monitoring locations (including top of casing elevations), unique Minnesota Location Identifiers, parameters, and frequency (annual sampling periods) including the following:
 - The order in which the monitoring points will be sampled [7035.2815, subp. 14 (H)]
 - All tests and measurements needed at each monitoring point, and the order in which they will be carried out [7035.2815, subp. 14 (H)]
 - Equipment and containers to be used, procedures and precautions for their use [7035.2815, subp. 14 (H)]
- Procedures needed at each monitoring point and the order in which these procedures will be carried out
- Procedures and precautions to avoid introducing contaminants from outside sources into monitoring wells or samples, and when and how equipment must be cleaned between uses [7035.2815, subp. 14 (H)]
- Procedures for purging each monitoring well before each sampling [7035.2815, subp. 14 (H)]
- If required, procedures for sampling surface water monitoring points, including exact sampling locations and depths, and for sampling leachate [7035.2815, subp. 14 (H)]
- Quality control procedures to identify outside sources of contamination and sampling error, including types and numbers of quality control samples to be used in the field and during transport and handling procedures for these samples [7035.2815, subp. 14 (H)]
- Procedures and criteria for field filtration of samples, when appropriate, using in-line methods or other procedures that minimize loss of dissolved constituents from solution [7035.2815, subp. 14 (H and K)]. Typically, a 0.45-micron filter should be used.
- Sample preservation, including preservatives and temperature control requirements [7035.2815, subp. 14 (H)]
- Procedures for sample labeling, sample handling and storage at the facility, and transport to the laboratory [7035.2815, subp. 14 (H)]
- Chain of custody procedures [7035.2815, subp. 14 (H)]
- Procedures for measuring water levels [7035.2815, subp. 14 (J)]
- Procedures for well purging and stabilization, including criteria to determine stabilization [7035.2815, subp. 14 (J)]
- Examples of all field records, logs, and forms; they must include places to record the names of the persons conducting the sampling, the time and date each monitoring point is sampled, water elevations and other required field measurements, and the evacuation procedures and test results before sampling. The owner or operator must retain the field records throughout the operating life of the facility and the postclosure period. [7035.2815, subp. 14 (L)]
- Procedures for inspecting monitoring points for damage or obstructions. Damaged or obstructed monitoring points must be repaired, and the point must be resurveyed and incorporated into the SAP, as necessary. [7035.2815, subp. 11 (T)]
- Management of investigative-derived waste (IDW)
- Any standard operating procedures (SOPs) including calibration of field equipment or other tasks listed above

Analysis

- Documentation of analytical methods, quality control procedures, and laboratory equipment used; they should be chosen to yield accurate results within the range of concentration and composition of the samples analyzed. All appropriate actions must be taken to minimize error and to assure the reliability, precision, and accuracy of the analytical results. [7035.2815, subp. 14 (M and N)]
- Responsibilities of laboratory personnel [7035.2815, subp. 14 (N)]
- Sample containers and preservatives, cleaning of sample containers, and sample holding times [7035.2815, subp. 14 (N)]
- For each analytical constituent, the laboratory's measurements of precision and accuracy over a range of concentrations, limit of quantitation, and an explanation of how these quantities were measured [7035.2815, subp. 14 (N)]. Ensure the laboratory used to analyze the samples can meet the reporting limits required in the permit. Some reporting limits may not technically be achievable. Limits that may not be achievable are listed on the Solid Waste Publications [webpage](#) under the Reports section.
- Methods used to identify and prevent contamination of samples in the laboratory and during transport [7035.2815, subp. 14 (N)]
- Analytical quality control procedures [7035.2815, subp. 14 (N)]
- Methods of reviewing and assessing all data for completeness and accuracy [7035.2815, subp. 14 (N)]
- Sample retention times after analyses are completed [7035.2815, subp. 14 (N)]
- Inspection, testing, and preventive maintenance programs for all laboratory equipment [7035.2815, subp. 14 (N)]
- Chain-of-custody procedures [7035.2815, subp. 14 (N)]
- Procedures for documentation and retention of quality control results [7035.2815, subp. 14 (N)]
- Continuing education requirements for analytical personnel [7035.2815, subp. 14 (N)]
- Documentation of the quality assurance program including quality control procedures to assess the reliability, precision and accuracy of the analytical results [7035.2815, subp. 14 (O)]
- Descriptions, criteria for, and frequencies of use of field and trip blanks, laboratory blanks, calibration standards, laboratory control samples, matrix spike/matrix spike duplicates, field duplicates, and other quality control procedures [7035.2815, subp. 14 (O)]
- MDH accreditation certificate for the laboratory

Reporting

The SAP should describe the information to be submitted with the monitoring results including:

- A certification signed by the sampling personnel, analytical laboratory, and owner or operator stating whether all procedures, from obtaining the samples through completion of the analyses, were performed as described in the approved SAP; describing any departures from these procedures; and explaining why these departures were necessary [7035.2815, subp. 14 (P)]
- Map showing location of sampling points, the fill areas with waste type identified, and the compliance boundary

- Water elevations and other required field measurements and observations, dates and times when each sample was collected and received by the analytical laboratory, and the date each sample was analyzed [7035.2815, subp. 14 (P)]
- Analytical results from all blanks [7035.2815, subp. 14 (P)]
- Any additional information needed to establish the validity of the analytical results, including precision and accuracy data from the batch of samples in which each sample was analyzed, limits of quantitation, and results from other quality control procedures, chain-of-custody records, and field records [7035.2815, subp. 14 (P)]
- Results that are not low enough to establish compliance with the reporting limit should be J flagged.
- An annual report must be submitted that includes an evaluation of recent and long-term trends in the concentrations of monitored constituents and in water elevations [7035.2815, subp. 14 (Q)]
- Tables of the analytical results to date and those that exceeded the ground water performance standards or surface water standards clearly highlighted; if reporting limits were not met for specific parameters, a discussion of those reporting limits should be included in the report. [7035.2815, subp. 14 (Q)]
- Field data sheets and complete laboratory reports
- The effect the facility is having on ground water and surface water quality [7035.2815, subp. 14 (Q)]
- Recommendations for any additions, changes, or maintenance needed in the monitoring system [7035.2815, subp. 14 (Q)]
- All environmental monitoring data including groundwater, surface water, leachate, gas, and soil monitoring results should be submitted electronically through the Environmental Quality Information System (EQulS) data environment using the LAB_MN format.
- It is recommended that the Minnesota Pollution Control Agency (MPCA) Chain of Custody form be used. If another chain of custody form is used, ensure that all the required fields and associated data formats on the MPCA chain of custody form are included. The Project Code for compliance at Solid Waste facilities is PRJ07913. The Minnesota Location Identifiers must be used to ensure the data are associated with the correct sampling locations. If you have any questions about the location identifiers for your facility, MPCA Program staff should be able to provide assistance.
- More information about report and data submittal can be found on the MPCA Solid Waste Permitting webpage - <https://www.pca.state.mn.us/waste/solid-waste-permitting>.