

NMED Solid Waste Bureau Landfill Leachate Monitoring Guidelines

Chemical characterization of landfill leachate provides valuable information on site-specific constituents that might pose threat to ground water when liner integrity is compromised. Although the New Mexico Solid Waste Rules do not formally require sampling of landfill leachate, chemical characteristics of leachate are considered by the Solid Waste Bureau (SWB) in approving alternate detection monitoring points (20.9.9.9.H NMAC) and reduced or alternate parameter lists (20.9.9.11.A NMAC). Knowledge of leachate chemistry can also be useful in other situations that involve determination of potential threat to ground water, contaminant source, or legal responsibility for ground water contamination. For example, a determination that a source other than a landfill caused ground water contamination (20.9.9.11.C NMAC) may rely on leachate chemistry to prove that a particular contaminant was not released from the landfill because it was not present in leachate.

The SWB recognizes the importance of having information on leachate chemistry and recommends that each landfill with a leachate collection system performs leachate characterization in accordance with the following guidelines: (NOTE: Additional leachate testing requirements might apply to landfills that use leachate for dust control or discharge leachate to a wastewater treatment plant.)

1. Leachate should be sampled from a leachate sump. If a landfill has more than one sump that contains leachate, the leachate sample should be a composite sample incorporating leachate from different sumps at the ratio that corresponds to the volume of leachate pumped out from individual sumps during the previous two years.
2. Each landfill with a leachate collection system should perform a single, preliminary sampling of leachate for all parameters in Subsections A and C of 20.9.9.20 NMAC, as well as selected volatile fatty acids (acetic, propionic, and butyric).
3. Based on the results of the preliminary sampling, the landfill owner or operator should develop a site-specific reduced parameter list for leachate monitoring. In general, this list should include:
 - a. all inorganic and organic parameters that are non-detectable in background ground water samples but are present in leachate, and their maximum concentrations in leachate are at least 10 times higher than their detection limits in ground water, and
 - b. all inorganic and organic parameters that are detectable in background ground water samples, and their maximum concentrations in leachate are at least 10 times higher than their corresponding maximum background concentrations (after removing outliers) in ground water under the site.

Volatile fatty acids do not need to be included on that list. As an alternative to the above rules, the ASTM D 7045-04 "Standard Guide for Optimization of Ground Water Monitoring Constituents for Detection Monitoring Programs for RCRA Waste Disposal Facilities" may be used in developing the reduced parameter list.

The landfill owner or operator should submit the proposed reduced parameter list to the SWB for review and comments.

4. The succeeding sampling of leachate should be performed at the frequency of once every two years in the following manner:
 - a. The next two sampling events (over the next 4 years) should be for the reduced parameter list.
 - b. The subsequent sampling event (6 years after the preliminary sampling) should be for the same expanded list of parameters as the preliminary sampling (all parameters in Subsections A and C of 20.9.9.20 NMAC and acetic, propionic, and butyric acids).
 - c. The landfill owner or operator should evaluate the results of the expanded sampling and should adjust the reduced parameter list as necessary. The

landfill owner or operator should submit the adjusted reduced parameter list to the SWB for review and comments.

- d. The cycle of two sampling events for the reduced parameter list and one sampling events for the expanded parameter list starts again.
5. The SWB may recommend modifying the frequency of sampling and/or the list of parameters for leachate monitoring if the landfill is in an assessment monitoring or a corrective action.
6. If no leachate is present in a leachate sump and leachate sampling has to be postponed, the landfill owner or operator should make its best effort to sample for the expanded parameter list every six years.

NMED SWB Recommended Leachate Monitoring Parameters

A. Parameters for characterization of landfill leachate, sampled and analyzed

1. pH
2. Specific conductance
3. TDS (Total dissolved solids)
4. Ammonia-N
5. Nitrate-N
6. TKN (Total Kjeldahl nitrogen)
7. Chloride
8. Sulfate
9. Aluminum
10. Chromium
11. Copper
12. Iron
13. Lead
14. Manganese
15. Nickel
16. Zinc
17. Benzene
18. Ethylbenzene
19. Methylene chloride (Dichloromethane)
20. Tetrachloroethylene (PCE)
21. Toluene
22. Trichloroethylene (TCE)
23. Vinyl chloride
24. Xylenes (total)

B. Parameters for characterization of different phases of landfill development (from aerobic to methanogenic), sampled and analyzed every two years (in addition to parameters in A)

1. BOD (5-day Biochemical oxygen demand)
2. COD (Chemical oxygen demand)
3. TOC (Total organic carbon)

4. Alkalinity (carbonate)
5. Phosphate (total, as P)
6. Calcium
7. Magnesium
8. Potassium
9. Sodium
10. Acetic acid
11. Propionic acid
12. Butyric acid

Note: Leachate shall be sampled directly from the leachate collection sump, and not from the leachate collection pond.