

# Landfill Groundwater Monitoring Checklist

Alaska Department of Environmental Conservation  
Division of Environmental Health  
Solid Waste Program

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The Alaska Department of Environmental Conservation (ADEC) Solid Waste Program has provided this checklist to outline the minimum required content for a landfill groundwater monitoring report. ADEC can and will require additional information on a site specific basis. This checklist is not intended as a comprehensive groundwater monitoring guidance. For additional guidance please refer to your facility's approved Quality Assurance Project Plan (QAPP) and other ADEC guidance documents.

## **Project Management**

- Title Page
- Distribution List
- Table of Contents
- List of Tables – groundwater elevations, field parameters, summary data tables
- List of Figures – vicinity map, site map with facility boundary, facility infrastructure, monitoring locations, and prevailing groundwater flow direction
- List of Appendices – field logs, monitoring log forms, chain of custody & sample receipt documentation, statistical testing summaries, data set for statistical testing, all historic data, laboratory reports, data review
- List of Acronyms and Abbreviations

## **Introduction**

- Name and location of facility
- Brief description of purpose of report (detection or assessment monitoring, or corrective action)
- Project/Task organization - Identify who conducted monitoring, prepared, reviewed and approved the report
- Date of monitoring event
- List the monitoring procedures followed, citing appropriate regulations, guidance, QAPP, etc.
- Identify whether wells are in detection or assessment monitoring program

## **Background**

- Location - geographic location of facility including map
- Discuss the operational history of the facility and current permit status
- Geology and hydrogeology
  - Description of geology and hydrogeology of the area
  - Reference any hydrogeological study including date(s) performed
  - Site map with all monitoring locations identified & prevailing water flow direction

- Monitoring program overview - history of monitoring program and current status
  - Identify all monitoring locations, specify as background or compliance points, status (active or inactive, water elevation or water quality parameters only, in need of maintenance, or decommissioning)
  - Frequency of sampling and sampling schedule
  - Discuss any ADEC approved changes to monitoring program

## **Description of Sampling Event**

- Date(s) of sampling
- Include a list of monitoring locations sampled during the monitoring event. If a monitoring location scheduled to be sampled was not included, discuss why and how this may be addressed in the future.
- Include details of sampling procedures
  - Who performed sampling
  - Groundwater level measurements
  - Water quality stabilization parameters
  - How samples were handled in field (collected in one day or over several days, how samples were stored until shipment to lab, how samples were shipped to lab, etc.)
  - Analytical laboratory sample collection – which constituents were sampled, order of sampling, sample containers, preservation and hold times
  - Field instrument/equipment use, maintenance, calibration
  - Description of field Quality Assurance (QA)/Quality Control (QC) - field duplicates, equipment blanks, trip blanks
  - Sampling documentation – field logs, monitoring log forms, Chain of Custody (COC)
- Discuss any field sampling issues
  - Sheen
  - Odor or color
  - Dry or frozen well
  - Extreme field parameters measured
  - Problems with equipment during sampling
  - Well condition issues (not locked, frost-jacking, damage, blocked, etc.)

## **Laboratory Analysis**

- Analytical lab(s), including appropriate certifications
- Analyses performed by lab and analytical methods
- Analytical turn-around time (TAT) – standard TAT is 30-days
- Discussion of detection limit adequacy to meet monitoring program objectives
- Discussion of analytical results – which constituents were detected
- Summary of results should be included in report text, but all analytical results should be provided in a table format (electronic file acceptable)

**Quality Control** – Review the approved QAPP and discuss any non-conformances in sampling, lab analyses, or reporting.

**Data Interpretation/Statistical Analysis** - Discuss detections and exceedances as compared to appropriate regulatory criteria.

- Identify which criteria are applicable
  - Background – discuss the background value being used, how it was determined, and how/when it's updated
  - Groundwater Protection Standard (GWPS) – source of the value being used for each constituent
    - Drinking water maximum contaminant level (MCL)
    - Background if higher than MCL or no MCL available, and how it was statistically determined
    - Health based level as approved by ADEC Solid Waste (18 AAC 75 Table C groundwater cleanup levels, EPA Regional Screening Levels (RSLs), etc.)
- Discuss detections of monitored constituents (Appendix I, Appendix II, Table J, other)
- Statistical evaluation of results
  - Identify data used for statistical test (the historical data set used; how duplicate, non-detects (NDs), and qualified results were used; identify outliers and rationale for excluding) [Note: complete data set used (preferably in electronic format – Excel) should be provided in report for review purposes]
  - Identify statistical tests used including error rates
  - Provide statistical testing summary sheets
- Discuss detections, exceedances, trends, correlations, etc.
- Notify ADEC within 14 days of owner/operator receiving sample results indicating any statistical exceedances of background or GWPS**

### **Analytical Results Table**

- Sample ID (include field sample ID and corresponding laboratory ID)
- Identify sample location as background or compliance point
- Parameter tested [gasoline range organics (GRO), volatile organic compounds (VOCs), etc.]
- Analytical method (AK101, SW8260, etc.)
- Detection Limits
- Quantitation Limits
- Results comparison criteria and source of criteria
- Present *all* results (not just detections or exceedances)
- Units of measure
- Flag qualified data
- Report all ND results with associated detection limit
- Identify detections and exceedances of criteria by bolding or highlighting
- Include footnotes to define flags, define all acronyms, identify sources of criteria

## Summary & Recommendations

- Summarize the results of laboratory and statistical analyses
- Identify any potential problems or other monitoring program concerns
- Discuss any quality control issues with sampling, lab analysis, or reporting
- Discuss any deviations from the QAPP and any associated corrective actions
- Provide recommendations for future monitoring events or corrective actions based on this report's findings

## List of References

### Required Attachments

- Field Logs (field notebook, monitoring logs)
  - Site conditions (weather, temperature, secure or not, etc.)
  - Well condition (secure, signs of tampering, damaged or destroyed, unable to locate)
  - Water level measurement data, purging/sampling data, water quality data (turbidity, odor, color, conductivity, pH), and remarks
  - Sampling time, date, and sampler
  - Units of measurement on everything
  - All corrections to field notes should be made by marking a single line through and initialing and dating the change so that it remains legible
- Laboratory Data Reports – should include all analytical results, QA/QC sample results, case narrative noting any laboratory QA/QC issues
- Monitoring well hydrographs may be included
- Chain of Custody Paperwork – original chain of custody documenting sample custody from sampling, shipping (airway bill), to lab receipt (laboratory receipt form)
- Graphs of constituent concentrations
- Data set for statistical testing, statistical results tables, control charts, etc.
- Historical Data File – all historic monitoring data should be provided with each report - preferably in electronic format (Excel).

**Monitoring reports must be submitted to ADEC within 60 days of receiving the laboratory results.**

If questions arise about what to include and discuss in a monitoring report please contact your ADEC project manager.