

# Guidelines for Sampling, Data Assessment, Determination of Background Conditions, and Use of Statistics



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

## **PURPOSE:**

This memo provides clarification on the Solid Waste Program (Program) recommendations for requirements of 18 AAC 60 for the following:

1. Sampling procedures and data collection.
2. Use of statistics.
3. Determination of background conditions.
4. Data assessment.

## **SAMPLING PROCEDURES:**

The following guidance documents provide fundamental guidelines and present methods and equipment options for sample collection:

- The U.S. Environmental Protection Agency's (EPA) *Solid Waste Disposal Facility Criteria Technical Manual* (EPA530-R-93-017) provides guidance on groundwater sampling.
- EPA's *Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers* Ground Water Forum Issue Paper provides guidelines for groundwater monitoring using procedures that minimize disturbance to the aquifer.
- The Alaska Department of Environmental Conservation (ADEC) Contaminated Sites Program's *Draft Field Sampling Guidance* also provides appropriate environmental sampling procedures.
- EPA's *Resource Conservation and Recovery Act (RCRA) Waste Sampling Draft Technical Guidance* (EPA530-D-02-002) provides guidance on sampling for the evaluation of solid waste.

Alternatives to the procedures and equipment contained in these guidance documents may be proposed in Facility Monitoring Plans for the Program's approval.

## **Field Measurements**

For groundwater, prior to any analytical sample collection, groundwater level measurements must be recorded. Water quality parameters as identified in the approved sampling plan should be collected until stable for three successive readings. Typical water quality parameters include temperature, pH, conductivity, oxidation-reduction potential (REDOX), dissolved oxygen (DO), and turbidity.

## **Qualified Person**

To ensure the quality of sample data, a qualified person should collect all analytical samples. A qualified person has a thorough understanding of environmental sample collection, familiarity with the Quality Assurance Project Plan (QAPP) and /or Monitoring Plan, and the ability to effectively execute the plan.



### **Approved Laboratory**

The Program requires that an ADEC approved laboratory be used for all analytical analyses. The ADEC Contaminated Sites Program provides approval of analytical laboratories for the Alaska Methods for petroleum organic compounds (Gasoline Range Organics by AK101; Diesel Range Organics by AK102; and Residual Range Organics by AK103) as well as other select organic and inorganic methods at <http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx>. The ADEC Drinking Water Program certifies laboratories for drinking water methods at <http://dec.alaska.gov/applications/eh/ehllabreports/certchemlabs.aspx>. Labs must be able to provide a copy of their current ADEC approval letter detailing the methods, matrices, and dates for which the lab has approval. If ADEC approval is not available for a specific method, a facility may propose alternative laboratory method certifications (i.e. NELAP certification) in their Monitoring Plan or QAPP for consideration by the Program.

### **USE OF STATISTICS:**

18 AAC 60.830 requires statistical analysis of sample data for each parameter to determine whether a statistically significant increase in any parameter has occurred in compliance wells over background concentrations. The program references EPA's *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance*, dated March 2009, for the appropriate use of statistics to comply with the requirements for groundwater sampling and analysis.

### **DETERMINATION OF BACKGROUND CONDITIONS:**

The determination of background conditions must be made on a site specific basis. The Program references the EPA's *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance*, dated March 2009. Chapter 5 of this guidance specifically addresses the establishment and updating background.

### **DATA ASSESSMENT:**

The focus of the data assessment process is to assure data usability for statistical analysis. Data reduction is a critical consideration in the data assessment process for the determination of data usability. Clear guidance and recommendations will ensure consistency of data quality for use in site management decision-making.

#### **Data usability**

Consistent with Chapter 1 of SW-846 (Quality Control) criteria, laboratory quality assurance and quality control measures must be reported and used to determine data usability. For further data qualifications, please refer to EPA's *National Functional Guidelines for Superfund Organic Methods Data Review* and EPA's *National Functional Guidelines for Superfund Inorganic Methods Data Review*.

#### **Data reduction**

Data reduction issues are commonly encountered during data assessments. The Program's recommendations on the issues of data reduction are consistent with those provided in the ADEC Contaminated Sites Program's *Guidelines for Data Reporting, Data Reduction, and Treatment of Non-detect Values - Technical Memorandum*. This includes reporting data from multiple results for the same constituent in the same sample, reduction of field duplicates to derive a single value for use, and the handling of non-detect results.

