



10.2 QUALITY ASSURANCE OBJECTIVES

QA objectives and procedures are included in the sampling strategy to assess and evaluate a wide variety of concerns from sample collection through laboratory analysis. Defining QA/QC requirements is integral to the DQO process and is detailed in Section 3.0. The DQO must be developed well before any sampling or analysis and must be clearly defined in the SAP and QAPP for each project. QA objectives and procedures must also be defined in the SAP and the QAPP and will depend on the results of the project specific DQO processes.

10.2.1 Data Quality Objectives

Data Quality Objectives are discussed in detail in Section 3.0 and summarized in this subsection. Environmental data must be of the appropriate type, quantity and quality to manage uncertainty and reach a defensible decision on appropriate response actions. To ensure that data obtained during a site investigation are adequate to identify or negate the presence of potential environmental hazards, the HEER Office recommends that the site investigation be developed using a **systematic planning approach**. This approach emphasizes using straightforward, clear questions to design and guide the site investigation. Consultation with the laboratory being utilized for sample analysis is also important to ensure the DQO can be met within their capabilities.

Systematic planning involves a series of well-thought-out steps that help ensure the investigation results are adequate to characterize potential environmental hazards posed by contamination and ultimately provide sufficient information to develop appropriate response actions. The recommended steps of the systematic planning approach, presented as Figure 3-1 in Section 3.0, function to establish the DQO for a site investigation.

DQO are established based on the expected end use of the data. For example, the data needed to perform a preliminary site screening assessment will differ significantly from the data needed to fully characterize a site and select an appropriate response action. DQO and the systematic planning approach in general are essential to developing a cost effective site investigation because they assure that resources devoted to sampling and analysis are not wasted on unnecessary or unreliable data.



10.2.2 QA Objectives

QA objectives must be specified in the project specific QAPP. For each sample matrix and environmental measurement type, define QA objectives in terms of the following information:

- Types of quality control (QC) samples and measurements involved
- Frequency of collection and analysis of QC samples and measurements
- How the QA objective is measured
- Acceptance criteria or QC limits for that measurement

For example, for soil samples analyzed for semivolatile organic compounds (SVOC), a project-specific QAPP might specify that the precision will be measured as the relative percent difference (RPD) between the results of matrix spike (MS) and matrix spike duplicate (MSD) samples. The QAPP might further specify that MS/MSD samples will be collected at a frequency of 1 MS/MSD sample for every 20 environmental samples, and that the QC limit for RPD is 20 percent for all spiking compounds.

Analytical data must be evaluated for compliance with QC limits. Typically, when analytical data do not meet the QC limits, corrective action must be initiated or the data will be qualified or rejected. Corrective action includes stopping the analysis; examining instrument performance, sample preparation, and analysis information; recalibrating instruments; preparing and reanalyzing samples. Examples of QC results indicating that corrective action may be necessary are provided in Subsection 10.8.

10.2.3 Quantitation Limits

A crucial QA objective is for sensitivity, which is generally expressed in the form of the method quantitation limit(s) (also commonly referred to as 'reporting limits') for the analytical method(s) selected. The *concentrations of concern* will be based on risk-based criteria, regulatory limits, and other similar guidelines. In Hawai'i, the default screening criteria on which to base quantitation limits are the HDOH HEER Office Tier 1 EALs (HDOH, 2008).

Quantitation limits reflect the influences of the sample matrix on method sensitivity and are typically higher than detection limits.



Section 10
Data Quality Assurance and Quality Control (QA/QC)
Quality Assurance Objectives

Quantitation limits provide a reliable indication of the amount of material needed to produce an instrument response that can be routinely identified and reliably quantified when applying a particular analytical method to real environmental samples.

The HEER Office requires analytical methods with sensitivities appropriate to the intended data use. Whenever possible, analytical methods should be specified such that matrix-specific reporting limits are lower than any contaminant concentrations of concern. In the event that the laboratory would not be able to achieve reporting limits below the screening criteria, the investigation team should first contact the HEER Office and present the proposed alternative laboratory reporting limit for the Chemical of Potential Concern (COPC) in a SAP or QAPP. Advance concurrence from the HEER Office for use of reporting limits above a relevant EAL must be obtained *prior* to initiation of field sampling. As part of the process for obtaining concurrence, the HEER Office will require that the investigation team document the proposed levels and provide well-documented evidence, rationale, and justification for using higher reporting limits.