

San Gabriel Valley Area 3 Primary Data Quality and Usability Assessment Plan

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1.0 Introduction

The objective of the Primary Data Quality and Usability Assessment (PDQUA) is to ensure that the conclusions and recommendations presented in the San Gabriel Valley Area 3 (SGV-A3) remedial investigation (RI) report are supported by chemical data of known, acceptable, and documented quality. The PDQUA is limited to data collected by CH2M HILL on behalf of EPA, while a separate usability assessment focuses on secondary data used for the RI.

The data quality objectives (DQOs) and quality control requirements for primary environmental data acquisition are documented in the *Quality Assurance Project Plan for San Gabriel Valley NPL Area 3 Remedial Investigation Field Activities (QAPP)* (EPA, 2003). These DQOs have been refined and revised to include the following components:

- DQO Component 1: Source Identification and Characterization;
- DQO Component 2: Nature and Extent Evaluation of Regional Contamination;
- DQO Component 3: Ecological and Human Health Risk Assessments;
- DQO Component 4: Hydrogeological Conceptual Model.

Because the critical project decisions will be made based in large part on the analytical results from groundwater samples, the PDQUA will focus on the quality and usability of analytical data. Therefore, primary data will be specifically assessed for usability in terms of the first three DQO components listed above. The hydrogeological conceptual site model does not rely on analytical data and therefore the quality assessment will be qualitative only, limited to review of field documentation for compliance with the approved plan.

2.0 Qualitative and Quantitative Assessments

The assessment of primary data will include both qualitative and quantitative quality indicators in terms of precision, accuracy, representativeness, comparability, and completeness (the PARCC parameters). The following table presents these terms and the evaluation criteria that will be used for the primary data quality assessment.

TYPE	PARCC PARAMETER	EVALUATION CRITERIA	QUALITY CONTROL INDICATOR
Qualitative	Comparability	Do the quality systems employed during sample collection and analysis comply with the requirements of the approved QAPP and the currently accepted standards and procedures?	Field records of sample collection and laboratory documentation of sample analysis.
	Representativeness	Was the approved sample collection and analysis strategy implemented and was the sampling design sufficient to produce results that represent site conditions?	Sampling design, including field modifications (if any), and analytical results.

TYPE	PARCC PARAMETER	EVALUATION CRITERIA	QUALITY CONTROL INDICATOR
Quantitative	Precision	Are the results of replicate analyses within the quantitative project acceptance criteria?	Laboratory and field duplicates.
	Accuracy	Are the recoveries of target analytes from samples containing known concentrations (analytical spikes) within project acceptance criteria?	Laboratory Control samples (blank spikes), Matrix Spike Samples, and Matrix Spike Duplicate Samples.
	Completeness	Are sufficient usable data available to support the project objectives?	Data flags applied during data review and validation.

2.1 QUALITATIVE ASSESSMENT

The qualitative assessment will include a discussion of those project planning, implementation, and quality elements that contribute to the representativeness and comparability of the sampling and analysis activities.

2.1.1 Sampling Design

The overall sample collection design and implementation will be reviewed in terms of the revised DQOs developed for each of the four project objectives listed above. The purpose of this review will be to establish whether the primary sample results are representative of site conditions and comparable to data from other sources within SGV-A3. In general, the following items will be used as a basis for evaluation of sampling design:

- Are sufficient usable data available to support project objectives?
- Were the sample results obtained using standard techniques and procedures?

- Are there any quality control issues that negatively affect the results (e.g., decontamination issues evidenced by equipment blank contamination)?

The evaluation of the sampling design and identification of data gaps, if any, will be included in the main body of the RI report and will be summarized and/or referenced in the data assessment.

2.1.2 Field Quality Control Activities

All records of sample collection including water level measurements, field notebooks, well construction documentation, and chain of custody records will be reviewed as part of this assessment to ensure supporting documentation are accurate and representative of field conditions. A summary of field quality control activities, adherence to, and any deviations from, the approved plan will be presented in this section of the PDQUA. Also included in this section will be an evaluation of the results of analysis of field quality control samples including trip blanks, equipment blanks, and field blanks. The quantitative comparison of field duplicates is presented in Section 2.2.3 and a qualitative discussion of this comparison will be included in this section in terms of representativeness.

2.1.3 Audits and Inspections

The results of any field and/or laboratory audits will also be presented as part of the primary data quality assessment.

2.2 QUANTITATIVE ASSESSMENT

The quantitative assessment will provide an estimation of the accuracy and precision of the analytical results based on 1) the findings of the data review and validation and 2) computation of project completeness.

2.2.1 Analytical Results Evaluation

- *Evaluation of performance evaluation sample data*

Performance evaluation sample results will be used as a tool to evaluate the accuracy of primary analytical data. At the start of the SGV-A3 sampling and analysis program, blind performance evaluation samples were submitted to laboratories during the first groundwater sampling events at new monitoring wells. The results of laboratory analysis of these performance evaluation samples and a discussion of the impact of any outlying results on data usability will be presented in the PDQUA.

- *Results of data review and validation*

The results of the data review and validation of project (e.g., groundwater) sample data will be the primary data usability assessment tool. Data review equivalent to EPA Region 9 Tier 1A (cursor manual review)/Tier 1B (automated review using CADRE¹) have been

¹ CADRE: USEPA Computer Aided Data Review and Evaluation software

performed on 90 percent of the data. The use of Tier 1A/1B reviewed data is a deviation from Section D1 of the QAPP, which specifies Tier 2 review for 90 percent of the data. This change was made due to budgetary constraints. However, as Tier 2 review is a focused review of results in terms of project objectives, the preparation of this PDQUA for all of the primary data will adequately meet that requirement.

Data validation equivalent to EPA Region 9 Tier 3 (full manual review) has been performed on 10 percent or more of the data based on laboratory, analytical method, and representative sampling period. Data flags are applied to individual results during both Tier 1A/1B review and Tier 3 validation when one or more of the associated accuracy and precision results exceed specified control limits. The following quality control samples and measurements will provide the accuracy and precision basis for data flagging:

Accuracy

- Initial and Continuing Calibrations
- Laboratory Control Sample Recovery
- Matrix Spike (MS) Recovery
- Surrogate Recovery (organic methods only)

Precision

- Laboratory Duplicate Relative Percent Differences (RPDs)
- MS\Matrix Spike Duplicate RPD

Specific data deficiencies identified during the Tier 3 validation will be summarized as part of the PDQUA. A brief summary of the findings of the Tier 1A/1B review will be included, although the Tier 3 data validation findings will be considered to represent the overall quality of the entire data set.

2.2.2 Evaluation of Field Duplicate Results

Field duplicate samples were collected at an approximate frequency of 10 percent of the primary samples collected. Field duplicate sample pairs will be compared as follows²:

ANALYTICAL RESULTS	CRITERIA	CONCLUSION
Both results not detected	reporting limits differ by more than $\pm 25\%$	Disagreement
One positive result, one non-detected	>5x difference >10x difference	Disagreement Major Disagreement
One positive result above the RL, one positive result between the MDL and RL	>3x difference >5x difference	Disagreement Major Disagreement
Both results above the RL, calculate RPD	>30% >65%	Disagreement Major Disagreement

² CRREL Special Report No. 96-9, "Comparison Criteria for Environmental Chemical Analyses of Split Samples Sent to Different Laboratories-Corps of Engineers Archived Data", Grant, C.G, Jenkins, T.F. and Mudambi, A.R., USACE Cold Regions & Environmental Research Laboratory, Hanover NH, May 1996.

The results of the field duplicate comparison will be used to assess whether the overall project precision goal has been met, although no data will be flagged based on field duplicate outliers. For the Source Identification, Characterization and Regional Contamination, and Human Health and Ecological Risk Assessments DQOs, both field duplicate results will be considered. However, the higher positive result or lower reporting limit for negative (i.e., non-detect) results will be used for decision making.

2.2.3 Evaluation of Completeness and Sensitivity

- *Completeness*

Completeness will be calculated by method or the project as follows:

$$100 * \text{number of useable results} / \text{total number of results}$$

Field quality control samples (trip blanks, equipment rinsate blanks, and field blanks) will be excluded for the purposes of calculating completeness.

- *Sensitivity*

The data will be compared to the appropriate project water quality standards. If individual analytes are not detected and the associated reporting limit exceeds the respective AL, the data will be summarized, the root cause will be investigated, and the findings discussed in the PDQUA.

3.0 Assessment Summary

The assessment summary will include a discussion of the effect of outlying data on data usability for each of DQO components supported by analytical results.

Attached is a proposed outline for a technical memorandum that will summarize the results of the PDQUA.

Outline for San Gabriel Valley Area 3 Primary Data Quality and Usability Assessment

1.0 Introduction

2.0 Evaluation of Representativeness and Comparability

2.1. Evaluation of Sampling Design and Implementation

2.1.1. Summary Sampling Activities and Analytical Program

2.1.2. Field Documentation

2.2. Field Quality Control Samples

2.2.1. Trip Blanks

2.2.2. Equipment Rinsate Blanks

2.2.3. Field Blanks

2.2.4. Field Duplicates

2.3. Surveillances and Inspections

3.0 Analytical Data: Evaluation of Precision and Accuracy

3.1. Performance Evaluation Samples

3.2. Tier 1A/1B Review Summary

3.3. Tier 3 Validation summary

3.3.1. Holding Times

3.3.2. Blanks

3.3.2.1. Calibration Blanks

3.3.2.2. Preparation/Method Blanks

3.3.3. Calibration

3.3.3.1. Initial Calibration Verification

3.3.3.2. Initial Calibration

3.3.3.3. Continuing Calibration

3.3.4. Laboratory Control Samples

3.3.5. Laboratory Duplicates

3.3.6. Matrix Spike Samples

3.3.7. Surrogates

3.3.8. Internal Standards

4.0 Completeness

5.0 Quantitation and Sensitivity

6.0 Overall Assessment

TABLES

Summary of Sample Delivery Groups

Summary of Samples Collected

Summary of Qualified Results-Tier 3 Validation

Field Duplicate Results

Performance Evaluation Results

ATTACHMENTS

Tier III Data Validation Reports

Tier 1A/Tier 1B Validated Results