

APPENDIX A
QUALITY CONTROL SUMMARY REPORT

A1.0 Evaluation of Data Quality

An evaluation of the analytical data quality from the samples collected during the first sampling event of the long-term monitoring (LTM) program at Landfills No. 1, 2, and 3 at Fort McClellan, Calhoun County, Alabama is discussed in this quality control summary report.

Quanterra Environmental Services (QES) Laboratory data were reported in three analytical lots based on the order the samples were received. The lot numbers assigned are: H8B140127, HB8170124, and H8B190157. Lot H8B140 consists of seven field samples, two trip blanks, two field duplicates, and one matrix spike/matrix spike duplicate (MS/MSD). Lot H8B170124 consists of 12 field samples, 2 trip blanks, 2 field duplicates, and 1 MS/MSD. The lot H8B190157 is comprised of four field samples, two trip blanks, and one material blank. Copies of the data packages for each of these lots are included in Appendix B of the LTM.

U.S. Army Corps of Engineers (USACE)-South Atlantic Division (SAD) Laboratory data were reported in one lot. It consisted of 2 QA split samples and 1 trip blank. A copy of the analytical package from the SAD Laboratory is included in Appendix C of the LTM.

All samples were received in good condition by both laboratories and logged for analysis by the U.S. Environmental Protection Agency (EPA) SW-846 methods prescribed on the chain of custody forms. Sample A-0003, the LF1-G02 field duplicate sample, nitroexplosive aliquot was broken in the laboratory and not analyzed. No other nonconformances were noted. Although no formal data validation was performed for this data set, the IT project chemist completed a thorough review of the data packages and prepared the following evaluation of analytical data quality.

A2.0 Accuracy

The main indicators of analytical accuracy are the recovery of surrogate and matrix spike (MS) compounds placed directly on the sample matrix immediately prior to preparation and analysis. In addition to MS and surrogate spikes, the methods require a laboratory control sample (LCS) that is prepared on a blank matrix that is free of chemical interferences. While MS and surrogate recoveries indicate accuracy on a sample matrix-specific basis, the LCS represents the accuracy without matrix interferences. The following were noted during data review:

- **H8B140127: Pesticide/Polychlorinated Biphenyl (PCB).** The surrogate, decachlorobiphenyl, for sample A-0009 (LF2-3) showed 0 percent recovery. The other surrogate spiked showed acceptable recovery as did the associated MS/MSD, and LCS. All sample values for pesticide and PCBs were less than the reporting limit. The reporting limits should be considered estimated and this analysis possibly considered biased low due to matrix effects.
- **H8B170124: Semivolatile Organic Compounds (SVOC).** The surrogate compounds, phenol-d₅ and 2-fluorobiphenyl, were outside the control limits for sample A-0012 (LF3-OLF1). Phenol was out low (1 percent recovery) and 2-fluorobiphenyl was out high (216 percent recovery). Although the EPA data validation guidelines state that one surrogate can be outside control and the analysis still be considered acceptable, the range of the recovery should result in the qualification of all the SVOC results of this sample as estimated. Only one compound was detected: di-n-butyl phthalate at an estimated concentration of 6.9 micrograms per liter (µg/L) (below reporting limits).
- **H8B190157: Volatile Organic Compounds (VOC).** On sample A-0038 (material blank), the surrogate, toluene-d₈, exceeded control limits as did the subsequent reanalysis. As the LCS was in control, the laboratory attributed the exceedance to matrix effects with no impact on data usability.

SVOCs. Individual surrogates were slightly low for samples A-0026 (LF3-OLF11), A-0028 (LF3-OLF13), and A-0038 (material blank). Not enough sample volume remained to perform a reanalysis and the laboratory attributed these occurrences to matrix effects with no impact on data usability.

Pesticide/PCBs. To meet holding times, the laboratory substituted separatory funnel preparation for the typical liquid/liquid extraction for the samples in this lot. This included samples: A-0013 (LF3-OLF2), A-0026 (LF3-OLF11), A-0028 (LF3-OLF13), A-0034 (LF3-MW1-94), and A-0038 (material blank). Due to laboratory oversight, no pesticide compounds were used to prepare the associated LCS. Because the quality control (QC) limits for this analysis were developed using liquid/liquid extraction, some surrogates were out low due to the separatory funnel preparation method. Since no pesticide compounds were spiked in the LCS, no quantified accuracy measurement was performed for this analysis on these samples. No pesticide compounds were detected above reporting limits; however, because the surrogate compounds were out low, the analysis may be biased low. The pesticide reporting limits given for the listed samples in this lot should be considered estimated and the use of this data is qualified.

Nitroexplosives. Sample A-0028 (LF3-OLF13) contained high suspended particulate, which led to poor extraction efficiency. This extraction efficiency problem resulted in high surrogate recovery (258 percent) and slightly elevated reporting limits. No nitroexplosives were quantified, but the use of these nitroexplosive reporting limits should be qualified as estimated and possibly biased.

With the exception of the noted items, the analytical accuracy measured using the method prescribed procedures were acceptable.

A3.0 Precision

A combination of field duplicates/quality assurance (QA) split samples and laboratory duplicate analysis of the MS and LCS were performed to assess precision. Nothing outside the laboratory control limits was observed for duplicate MS or LCS data. The following were observed for field duplicates and QA splits:

- **LF1-G02 (A-0002/0003).** All relative percent differences (RPD) for organic and inorganic analyses were less than 20 percent except for iron (21.4 percent) and zinc (28.7 percent). Neither have been identified as constituents of concern.
- **LF2-3 (A-0009/0010).** Large RPDs were noted for metals, possibly due to suspended sediments. The field duplicate aliquot contained much greater concentrations of calcium, iron, magnesium, and sodium than the original sample. RPDs ranged from 29.9 to 182 percent. None of the metals reported are contaminants of concern.
- **LF3-OLF3 (A-0014/0015/0016).** For the field duplicate, all organic compounds demonstrated RPDs less than 13 percent and metals ranged from 2.2 to 30.1 percent (for aluminum). For the QA split sample, the VOC data from the QA split sample showed a reporting limit of 2 µg/L; therefore, only three VOC compounds in the split sample were quantified. Their RPDs ranged from 2.2 to 31.1 percent. Inorganics ranged from 2.4 to 134 percent (for iron).
- **LF3-OLF7 (A-0020/0021/0022).** For the field duplicate, all VOCs had less than 11 percent RPD and inorganics ranged from 1.2 to 69.6 percent (for iron). For the QA split, all VOC results were quantified as less than 2 µg/L, so no RPD calculations were possible. The inorganic results showed a range of 0 to 63.1 percent (for zinc).

Had the reporting limits for the QA split samples been reduced to 1 µg/L or estimated values reported down to the method detection limits, more precision measurements would have been possible among the QA split and original sample data. Overall, the precision demonstrated for the field duplicate and QA split samples are acceptable with the noted exceptions.

A4.0 Blank Contamination

Both field QC samples (trip blank and material blank) and standard laboratory method blanks were used to assess the potential for contamination from ambient sources during sample collection, handling, or preparation and analysis procedures. Several instances were noted during the data review where contamination of the field sample (specifically for VOCs) was likely based on the result of the associated blank. These are as follows:

- **H8B140127.** Method blanks analyzed on February 25 and 26, 1998 were contaminated with methylene chloride (0.32 J and 0.33 J $\mu\text{g/L}$, respectively). These method blanks were associated with all the samples in this lot. The two trip blanks, A-0040 (TB:021298) and A-0041 (TB:021398), contain methylene chloride (from the associated method blank), acetone (15 $\mu\text{g/L}$), and toluene (0.25 J $\mu\text{g/L}$). For the associated samples, values for the following compounds should not be used due to the similar levels found in the trip blanks: A-0001 (LF1-G01), A-0002 (LF1-G02), A-0003 (LF1-G02-FD), A-0005 (LF1-G04), A-0007 (LF2-1), A-0008 (LF2-2), A-0009 (LF2-3), A-0010 (LF2-3-FD), and A-0024 (LF3-OLF9).
- **H8B170124.** The trip blank, A-0042 (TB:021498), contained methylene chloride at 0.26 $\mu\text{g/L}$. The samples effected are: A-0020 (LF3-OLF7) and A-0021 (LF3-OLF7-FD); the methylene chloride results are unusable. The trip blank, A-0043 (TB:021698), contained methylene chloride (0.66 J $\mu\text{g/L}$) and toluene (0.30 J $\mu\text{g/L}$). Sample A-0033 (LF3-OLF19), methylene chloride is unusable and for samples A-0014 (LF3-OLF3) and A-0015 (LF3-OLF3-FD), methylene chloride and toluene are unusable.
- **H8B190157.** Method blanks analyzed on February 25 and 26 contained methylene chloride at trace levels, which affected the trip blank samples A-0045 and A-0046 and the material blank (A-0038). None of the field samples were affected as the none showed results greater than the reporting limit for methylene chloride.

The material blank that was collected of the on-site potable water source for decontamination rinse water was contaminated with a variety of VOC compounds including: 1,2-dichloroethene (0.21 $\mu\text{g/L}$), chloroform (3.0 $\mu\text{g/L}$), bromodichloromethane (1.0 $\mu\text{g/L}$), trichloroethene (2.0 $\mu\text{g/L}$), dibromochloromethane (0.40 J $\mu\text{g/L}$), and tetrachloroethene (0.60 $\mu\text{g/L}$). Several of these compounds were detected in the associated field samples; however, because they were not consistently detected in all samples, it is not likely that these contaminants in the field samples were produced from potable water contamination.

The blank samples collected were adequate in defining the potential contamination problems. An equipment rinsate blank would have been collected during this event, except due to supply problems with deionized water, inadequate resources were on site to collect the sample. An

equipment rinsate blank would have been helpful in conclusively determining if any of the contaminants present in the potable water material blank were carried through the decontamination process.

A5.0 Overall Data Quality Assessment_____

The field data and sample data review process as presented in this section of the report as well as the QES laboratory data packages in Appendix B of the LTM compare the sample results to pre-established target criteria to confirm that the data generated are of acceptable technical quality. Specific precision and accuracy criteria were reviewed which verify the achievement of these goals except where noted and discussed in the previous section. An assessment of ambient contamination as evidenced by field-generated and laboratory blanks indicated where field concentrations should be considered nonrepresentative of actual site conditions and the data not used.