64520

DATA ASSESSMENT

SITE Tutu Wells
LABORATORY ITAS - Knoxville JOB NUMBER ITEK 53554

DATA ASSESSMENT:

The current Functional Guidelines for evaluating organic data have been applied.

All data are valid and acceptable except those analytes which have been qualified with a "J" (estimated), "N" (presumptive evidence for the presence of the material), "U" (non-detects), "R" (unusable), or "JN" (presumptive evidence for the presence of the material at an estimated value). All action is detailed on the attached sheets.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

OVERVIEW:

Six (6) groundwater samples and one (1) trip blank were analyzed for Target Compound List (TCL), halogenated, and aromatic volatile organic compounds. These samples were analyzed according to the Superfund Analytical Methods for Low Concentration Waters for Organics (SAMLCWOA) and EPA Methods 601 and 602.

Reviewer's Signature: Karen Taylor Date: 3/1/1994

Verified By: David Rosenberg Date: 3/2/1994

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1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following analytes in the samples shown were qualified because of holding time:

All samples were analyzed within technical holding times.

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2. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, trip, field, rinse, or storage blanks are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. Storage blanks indicate whether contamination may have occurred during storage of samples. If the concentration of the analyte is less than 5 times the blank contaminant level (10 times for the common contaminants), the analytes are qualified as non-detects, "U". The following analytes in the samples shown were qualified with "U" for these reasons:

A) Method blank contamination

SAMLCWOA

Due to the presence of methylene chloride in both laboratory method blanks, VBLK1 and VBLK2, the reported results for methylene chloride in the following samples should be considered "not detected" and have been flagged "U": MW02DL, MW02DL2, MW03OR, MW04DL, and MW04DL2.

601/602

No positive results were reported for method blanks, therefore no qualification was required.

B) Field or rinse blank contamination ("water blanks" or "distilled water blanks" are validated like any other sample)

No field or rinsate blanks were submitted.

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2. BLANK CONTAMINATION (cont.):

C) Trip blank contamination

SAMLCWOA

Methylene chloride in the following samples may be qualified due to trip blank contamination, however these samples were previously qualified under method blank contamination: MW02DL2, MW03OR, MW04DL, and MW04DL2.

(Note that the laboratory reported non-detects for methylene chloride based on the low calibration standard of 1 µg/L as opposed to 2 µg/L indicated in the SAMLCWOA.)

601/602

The Method 601/602 trip blank sample did not contain any positive results, hence no action was deemed necessary.

D) Storage blank contamination

No storage blanks were present.

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3. MASS SPECTROMETER TUNING:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds, and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is bromofluorobenzene (BFB) and for semi-volatiles is decafluorotriphenyl-phosphine (DFTPP).

If the mass calibration is in error, or missing, all associated data will be classified as unusable, "R". The following samples shown were qualified with "R" because of tuning:

No qualifications were necessary.

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4. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

A) RESPONSE FACTOR

The response factor measures the instrument's response to specific chemical compounds. The response factor for the VOA/BNA Target Compound List (TCL) must be $\geq$ 0.05 in both the initial and continuing calibrations. A value < 0.05 indicates a serious detection and quantitation problem (poor sensitivity). If the mean RRF of the initial calibration or the continuing calibration has a response factor <0.05 for any analyte, those analytes detected in environmental samples will be qualified as estimated, "J". All non-detects for those compounds will be rejected ("R"). The following analytes in the samples shown were qualified because of response factor:

Acetone, 2-butanone, and 2-hexanone were rejected, qualified "R", in samples MW01, MW02, MW02DL, MW02DL2, MW03FD, MW03OR, MW04, MW04DL, MW04DL2, and the trip blank.

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5. CALIBRATION:

B) PERCENT RELATIVE STANDARD DEVIATION (%RSD) AND PERCENT DIFFERENCE (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be <30% and %D must be <25% (<30% for SAMLCWOA). A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J"; and non-detects are flagged "UJ". If %RSD and %D grossly exceed QC criteria, non-detect data may be qualified "R".

Method 601/602 sample quantitation was based the average response factor for percent RSDs <20%, otherwise a quadratic curve was used for quantitation as noted in the laboratory case narrative.

The following analytes in the samples shown were qualified for %RSD and %D:

Methylene chloride and 1,2-dibromo-3-chloropropane in samples MW01, MW02, MW02DL, MW02DL2, MW03FD, MW03OR, MW04, MW04DL, MW04DL2, and the trip blank.

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6. SURROGATES/ SYSTEM MONITORING COMPOUNDS (SMC):

All samples are spiked with surrogate/ SMC compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate/ SMC concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below. The following analytes for the samples shown were qualified because of surrogate/ SMC recovery:

SAMLCWQA

All surrogate recoveries were within quality control limits.

601/602

During the dilution analysis of sample DRM01, the surrogate recovery for ortho-chlorofluorobenzene (59%) was slightly below the laboratory acceptance limits (64-121%). Since the bromochloromethane surrogate recovery (61%) was within the associated 53 - 150% acceptance window in this sample, analytical results did not require qualification.

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7. INTERNAL STANDARDS PERFORMANCE:

Internal Standard (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +100%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more than ±30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +100%) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ" only if IS area is < 50%. Non detects are qualified as "R" if there is a severe loss of sensitivity (< 25% of associated IS area counts).

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction. The following analytes in the samples shown were qualified because of internal standards performance:

No qualifications were necessary.

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8. COMPOUND IDENTIFICATION:

A) SAMLCWOA FRACTION

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and ion spectra. For the results to be a positive hit, the sample peak must be within ± 0.06 RRT units of the standard compound, and have an ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For tentatively identified compounds (TIC), the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications. The following analytes in the samples shown were qualified for compound identification:

No qualifications were deemed necessary.

B) METHOD 601/602 FRACTION:

The retention times of reported compounds must fall within the calculated retention time windows for the chromatographic column. The following analytes in the samples shown were qualified because of compound identification:

No qualifications were deemed necessary.

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9. LABORATORY CONTROL SAMPLE (LCS) and SPIKED SAMPLE:

The LCS is an internal laboratory quality control sample designed to assess the performance of the analytical method. Qualification action for the LCS recovery is based on both the number of compounds that are outside of the recovery criteria and the magnitude of the exceedance.

Methods 601 and 602 call for a spiked sample to be analyzed to determine the accuracy of the analytical method in the matrix. Professional judgement may be used to qualify sample results based on spiked sample recoveries.

The following analytes, for the samples shown, were qualified because of LCS or spike recoveries:

Laboratory Control Sample and spiked sample percent recoveries were acceptable.