UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF RESEARCH AND DEVELOPMENT
National Risk Management Research Laboratory
Ada, Oklahoma 74820

Ground Water & Ecosystems
Restoration Division

May 3, 2011

MEMORANDUM

SUBJECT: Audit of Data Quality Draft Report for data reported by Shaw Environmental, for Task #23993, "Ground Water Investigation in Pavillion, Wyoming"

FROM: Steve Vandegrift
Quality Assurance Manager

TO: Cindy Paul
Project Officer, Contract #EP-C-08-034

Attached is the Audit of Data Quality (ADQ) report for data reported by Shaw Environmental for the project, Task #23993, entitled "Ground Water Investigation in Pavillion, Wyoming," QA ID #G-14478. As stated on page 2 of the report, three findings and three observations were identified during the ADQ.

When the corrective actions have been completed the audit will be closed out by the EPA QA Manager.

cc: Rick Wilkin, Technical Lead
Dominic DiGiulio, Acting Branch Chief, SRB
Mary Gonsoulin, Acting Branch Chief, ARTSB
David Jewett, Acting Division Director
Dennis Miller, Organics Analysis WAM
Suji Kumar, Shaw Program Manager
Shauna Bennett, Shaw QC Coordinator

Attachment

USEPA/Office of Research and Development
National Risk Management Research Laboratory
Ground Water and Ecosystems Restoration Division

AUDIT OF DATA QUALITY

Final

"Ground Water Investigation in Pavillion, Wyoming"
Task #23993
QA ID # G-14478
Dr. Rick Wilkin, Technical Lead Person

Performed by:
Steve Vandegrift
March 30-April 4, 2011

My signature below is evidence that I have read and acknowledge the findings of the audit of data quality. Additionally, I feel that the documented corrective actions address the findings adequately.

Rick Wilkin	Rick Wilkin	5/3/2011
EPA Technical Lead Person (Signature)	Print	Date

INTRODUCTION:

This ADQ was performed per the draft NRMRL SOP, *Performing Audits of Data Quality (ADQs)* to verify that requirements of the Quality Assurance Project Plan (QAPP) were properly implemented for the analysis of ground water samples submitted to Shaw. The scope of the ADQ was limited to target analytes that were determined to be critical by the Technical Lead Person, Dr. Wilkin. For the analyses conducted by Shaw, these were potassium and dissolved methane. Specifically, this included Shaw data report #s: 10-SM-196 (10/20/2010), 10-LH-66 (10/25/2010), and 10-LH-67 (10/27/2010). The audit was conducted by Steve Vandegrift, beginning on March 30, 2011, and concluding on April 4, 2011.

To assist in the interpretation of this ADQ report, the following definitions are provided:

Deficiency - an identified deviation that impacts the quality of the reported results.

Finding – a deficiency that has a significant effect on the quality of the reported results.

Observation - a deficiency that does not have a significant effect on the quality of the reported results.

.

EPAPAV0034733

ADQ SUMMARY:

The following pages detail the deficiencies identified during the ADQ.

Potassium data:

0 Findings Identified

Dissolved Methane data:

3 Findings Identified

3 Observations Identified

Based on the information reviewed during the ADQ and requirements of the project QAPP, there were no deficiencies identified for the potassium data. Six deficiencies were identified for the dissolved methane data. The three findings have a significant effect on the data quality. However, appropriate corrective actions will either eliminate or minimize their effect.

Based on the evidence collected during the audit, I certify that the report reflects an accurate representation of the subject reported data:

Steve Vandegrift — NRMRL-GWERD QA Auditor (signature)

Steve Vandegrift — Print

5/3/2011 — Date

EPAPAV0034734

Report #10-LH-66

FINDING 1

Description: Headspace concentrations of methane for four samples (EPA MW01 (P), EPA MW02 (P), EPA MW01 (P) (Dup), and EPA MW02 (P) (Dup)) were calculated using the calibration curve based on "Refinery Gas C6+." The area counts (raw data) for these samples exceeds the highest concentration standard in this curve. Sample responses should be bracketed by calibration standard responses. This resulted in final results that were higher than if calculated using the calibration curve of higher concentration standards (RSKSOP-194H).

Recommended Corrective Action: Recalculate the headspace concentrations of methane for the affected samples using the calibration curve "RSKSOP-194H" and their resulting final concentrations dissolved in water. Re-issue the data report.

Corrective Action (Shaw response):

RSKSOP-194H will be used to recalculate the values of the samples listed above. The recalculated results will be used to determine the methane concentrations in dissolved water and a report will be re-issued.

FINDING 2

Description: The analyst's notebook indicated that the sample vial septum leaked for sample EPA MW02 (P). This was not noted in the data report.

Recommended Corrective Action: This should be noted in the re-issued data report.

Corrective Action (Shaw response):

This will be noted on the re-issued report.

The analyst was reminded to report observations made during sample analysis.

OBSERVATION 1

Description: Concerning the "QC Data" in the report: Results were reported for four "Ar Blanks", which were identified as "MB" or Method Blanks. The raw data indicates that these four blanks were analyzed as well as a "Water Blank." The results for the "Water Blank" were not reported. The "Ar Blanks" are not Method Blanks, only the "Water Blank" would qualify as a Method Blank.

Recommended Corrective Action: Re-issue this report with the "Water Blank" results and identify it as the "MB." If the "Ar Blanks" are simply Ar gas injected into the GC, they should

not be identified as "MB." They could be identified as "Gas Blanks" or in some other manner to differentiate them from the "MB."

If this has been the practice by Shaw for QC reporting for these types of blanks, future reporting for all data reports should include this change.

Corrective Action (Shaw response):

The results for the Water Blank will be included in the re-issued report, and Shaw will change the name of the argon blank to Gas Blank.

Future reports will include this change.

Report #10-LH-67

FINDING 3

Description: Dissolved gas concentrations were erroneously calculated using the "existing headspace calculations." This will result in providing only the amount dissolved in the water and does not add the additional amount in the headspace that was originally dissolved in the water.

Recommended Corrective Action: Dissolved gas concentrations should be calculated using the "created headspace calculations." This reviewer is not familiar with the spreadsheet parameters used in the calculations, but it should be noted that those for bottle volume, headspace volume, and liquid volume may need to be handled differently for these types of samples than is done routinely for bottles in which a known volume of liquid is removed to create a headspace.

It is important that in the C_{AH} calculation (see RSKSOP-175v5) the basis for the volume of liquid is calculated correctly and results in the actual volume of liquid in the sample. For example, for the sample "LD02" the liquid volume is 147 ml (raw data indicated 3 ml of headspace in the cylinder). See Eqn 15 and 16 in RSKSOP-175v5. The volume of liquid is calculated by subtracting the headspace volume from the bottle volume. However, the total volume of headspace is 3 ml + 15 ml= 18 ml. The 15 ml is the fixed dead volume of the sampling apparatus. If 150 – 18 is used for the liquid volume, this is incorrect. Therefore, in the spreadsheet, you must add the dead volume of 15 ml to the 150 ml to get a bottle volume of 165 ml, therefore when 18 ml is subtracted from 165, it correctly calculates 147ml of liquid volume.

Corrective Action (Shaw response):

There are two choices for calculating gas dissolved in water. One for Created Headspace which is used when a volume of water is removed from the container (the headspace is created by that removal of water). The other is for Existing Headspace which is used when no water is removed

from the container i.e. the headspace already exists. These high pressure cylinders presented a third option for headspace, this is outside normal protocol and would require changes to the normal procedure. Shaw will comply with the recommendation for these samples and TD.

As noted in the ADQ report the "bottle volume, headspace volume, and liquid volume may need to be handled differently for these types of samples than is done routinely for bottles in which a known volume of liquid is removed to create a headspace." We will alter the values input into the "Created Headspace" based on the guidance in the previous paragraph and re-issue the data report

RSKSOP-327 is in draft and will be modified to address how to handle these calculations.

OBSERVATION 2

Description: Concerning the "QC Data" in the report: Results were reported for three "Ar Blanks", which were identified as "MB" or Method Blanks. Raw data indicates that three "Ar Blanks" and a "Water Blank" were analyzed. The "Ar Blanks" are not Method Blanks, unless they are run as described in the draft SOP for sampling from high pressure cylinders.

Laboratory duplicates were not analyzed and is a QC requirement.

Recommended Corrective Action: A "Water Blank" is not appropriate for these sample types. If Method Blanks were determined as presented in the draft SOP, they should be reported as "MB." "Ar Blanks" that are simply Ar gas injected into the GC are not Method Blanks and should not be identified as such. When re-issuing this report make the appropriate changes to the QC section of this report.

For future analyses of samples in high pressure cylinders, ensure that laboratory duplicates are analyzed.

Corrective Action (Shaw response):

The QC report as issued is correct. The Argon Blanks are Method Blanks as they are analyses of the argon used to flush the system.

Duplicates from a single high pressure cylinder were not analyzed as Shaw considered the tandem cylinders as duplicate samples. The High Pressure cylinders were attached together and obtained in pairs and treated as duplicates. Lab duplicates taken out of the same headspace will be analyzed in the future if sample volume and pressure permit for high pressure samples.

Report #10-LH-66

This observation does not require a response from Shaw.

OBSERVATION 3

The Field Blanks, Trip blank, and Equipment blank (EQBLK) had measurable levels of dissolved methane. This could be due to elevated ambient levels of methane since samples are being collected in an area of natural gas production. Or, sample vials could have been exposed to a methane source during transportation or it could have been in the water source itself. In either case, the impact of these low levels of methane is negligible.

The water used for these blanks was distilled water purchased locally in Pavillion. This issue with the sampling blanks was discussed with Dr. Wilkin and he plans to take blank water from RSKERC for the next sampling trip in April 2011.

EPAPAV0034738