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MEMORANDUM – FINAL REVISED - Recommended Qualification for Select Dust Cassette Data

Lester J. Dupes

Rock J. Vitale

ENVIRONMENTAL® STANDARDS

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MEMORANDUM – FINAL REVISED

Date: December 7, 2022

To: Michael Mc Anulty – Atlantic Richfield
Thomas Beckman – ERM
Elsie King - ERM

From: Lester J. Dupes, CEAC
Rock J. Vitale, CEAC

Copy: Cherie Zakowski – CDM Smith
Bob Alexander – CDM Smith

Subject: Recommended Qualification for Select Dust Cassette Data

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This supplemental quality assurance (QA) memorandum is based upon a sample processing error identified by Pace Analytical Services, LLC (Pace) of Minneapolis, Minnesota of dust filter cassette samples. Specifically, the dust filter cassette samples were collected as part of the Silver Bow Creek/Butte Area National Priorities List (NPL) Site, Butte Priority Soils Operable Unit, Residential Metals Abatement Program (RMAP) Quality Assurance Project Plan Non-Residential Parcels – Indoor Dust (dated February 28, 2022), (QAPP; February 2022).

Data for a total of 255 sample analyses for dust samples collected at the following schools using dust filter cassettes for the analysis for lead, arsenic and mercury are affected by this sample processing errors. These errors are inconsistent with the QAPP approved process for determining dust sample mass, and as detailed in Pace SOP ENV-SOP-MIN4-0059 "Preparation of Attic Dust and Filter Cartridge Samples by 3050B for Analysis by ICP/MS". Upon investigation by Pace, several different methods are used to obtain sample mass, none of these methods are consistent with the referenced SOP.

- Silver Bow Montessori [Sample Delivery Group (SDGs) 10608782 and 10615304)]
- Small World Day Care (SDGs10608783 and 10614864)
- West Elementary (SDG 10614872)
- East Middle School (SDG 10616707)

A summary of the approved process steps is bulleted below:

- Pace weighs the unopened dust filter cassettes.
- Pace empties the contents of each cassette (including filter) into a tared digestion tube.
- Pace then weighs the empty cassette.
- Pace subtracts the weight of the empty dust filter cassettes from the unopened dust filter cassette to obtain the gross weight removed.
- Filters are digested with the samples to digest any entrained dust material.

- Pace then subtracts the average filter weight of a clean filter to obtain the actual sample weight digested which is used in calculation of results.

Pace identified the below-listed deviations from the approved process steps.

- Dust samples are scraped from the filter using a stainless-steel spatula and placed in a tared vessel (no filter digested).
- Dust samples and one filter are removed from the filter cassette and placed in a tared vessel.
- Dust samples and two filters are removed from filter cassette and placed in a tared vessel.
- Dust samples and three filters (two filters and filter support) are removed from filter cassettes and placed in a tared vessel
- Dust sample and one of the two filters are removed between filter cassettes and placed in a tared vessel (combination of two bullets above).

In addition, Pace determined that no cassette weights are documented by the analysts. The analysts recorded the total weight of the sample using a tared weight of the digestion tube and recording the sample weight added for digestion.

Finally, Pace determines that no filter weights are subtracted from total weights used in quantitation of sample results. Clean filter cassettes were sent by ERM after analysis was complete to determine the average weight to be subtracted. The QAPP specified this process to occur prior to sampling.

Pace and ERM are currently finalizing documented corrective actions as final documentation for this issue.

Separate tables have been provided in Excel for use during the evaluation of the contents of this memo. Table 1 identifies the laboratory sample identification number, analyte name, dilution, actual sample initial weight, filter corrected initial weight, actual final volume, original posted numeric results, original reportable numeric, original reportable character, unit, filter weights, revised reportable numeric result, unit, validation convention #, validation reason code, validation screening code and additional notes. The purpose of this table is to serve as a data validation guide for use on the specific samples contained in Table 1. All results will be reported to the MDL as stipulated in the QAPP. Method detection limits, reporting limits, laboratory qualifiers will be added upon receipt of the revised data packages. Validation qualifiers,reason codes, and screening codes should be considered preliminary and may be changed or added based on full Stage 4 data validation and Level A/B assessment of the data. Table 2 provides a summarized reporting of original and revised results from Pace.

Based on discussions with Cherie Zakowski and Bob Alexander at CDM Smith the following reporting structure and data qualifications are recommended for the associated sample results.

Reporting Convention #1: If the sample mass (filter mass subtracted) is greater than 0.050g and the instrument response is sufficient for the calculated concentration to be above the reporting limit (RL), Pace laboratory will report the result with no qualifiers.

> Environmental Standards recommends not qualifying these sample results, since sufficient mass has been obtained during dust sampling and filter mass can be properly

subtracted from the total mass prior to quantitation of results. However, an “A” data qualifier reason code will be added to the electronic data deliverable (EDD). The “A” qualifier reason code will be defined as an “Absence of supporting QC” since the sample mass determination process was non-compliant with the approved QAPP. A comment will be added to the data validation report to alert the data user of this issue.

Reporting Convention #2: If the sample mass (filter mass subtracted) is less than 0.050g but greater than 0.020g (lowest verified calibrated balance weight) and the instrument response is sufficient to calculate the sample result to be over the RL, Pace will report the result with no qualifiers. If the instrument response results in quantitation of results between the RL and MDL will be qualified by Pace as “J”.

Environmental Standards recommends not qualifying results greater than RL, sample results between the MDL and RL will be qualified as estimated “J”. In addition, an “A” data qualifier reason code will be added to the EDD. The “A” qualifier reason code is defined as an “Absence of supporting QC” since the sample mass determination process was non-compliant with the approved QAPP. A comment will be added to the data validation report to alert the data user of this issue.

Reporting Convention #3: If the sample corrected mass (filter mass subtracted) is less than 0.020g and the instrument response is greater than the IDL, Pace will report the positive results if greater than RL or MDL. The results between the RL and MDL will be qualified by Pace as “J”. Results calculated at <MDL will be reported as “ND”.

Environmental Standards recommends qualifying the sample results with an “R” data qualifier thereby rejecting the result for that sample. The rejection is based on the lack of dust sample mass collected for the sample location and Pace’s demonstrated ability to accurately measure sample masses below 0.020g for sample digestion and analysis. In addition, an “A” data qualifier reason code will be added to the EDD. The “A” qualifier reason code is defined as an “Absence of supporting QC” since the sample mass determination process was non-compliant with the approved QAPP. A comment will be added to the data validation report to alert the data user of this issue.

Reporting Convention #4: Negative sample mass would indicate that no or very little dust was collected, and results would not be reported and rejected by the laboratory with the exception of samples identified as blind filter blanks. Blind filter blanks will be reported using a base sample mass of 0.050 g to mimic a representative sample mass for the calculation of sample results.

Additional Comment for Reporting Conventions: In addition to the “A” qualifier reason code, the following comment will be added to each data validation report. “A sample processing error occurred at Pace in which multiple analytical techniques were used in measuring the sample mass of dust from each dust filter cassette. These techniques were not documented nor performed in a manner consistent with the laboratory SOP contained in the approved QAPP. Validation has been performed in accordance with the September 13, 2022 technical memorandum titled: Recommended Qualification for Select Dust Cassette Data. The data user should consider this issue regarding the data usability of the lead, arsenic and mercury results in this SDG”

Additional Qualification for Usability: Due to the laboratory processing error, all lead, arsenic and mercury results for dust samples collected and analyzed in these SDGs will be qualified as “S” (screening quality) or “R” (unusable) (if < 0.020g) under the enforcement/screening

definitions detailed in Table 5.2 of the QAPP. This usability qualification is to further alert the data users performing data usability assessments as detailed in Section 5.3 of the QAPP.

End of Memorandum