Appendix B

Data Quality Review for Phase I Sampling Program for the DMTS Fugitive Dust Risk Assessment

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Introduction

A quality assurance review was completed by Exponent for selected chemical analyses and physical characteristics in soil, sediment, tundra soil, surface water, stream surface water, and vegetation samples collected during the Phase I sampling program for the DeLong Mountain Regional Transportation System (DMTS) fugitive dust risk assessment. A summary of the analytical methods used by the laboratories is presented in Table B-1.

Table B-1. Analytical methods

Constituent	Method
Metals	EPA Method 6000 Series (U.S. EPA 1997) and EPA Method 200.8 Series (U.S. EPA 1994)
SVOCs as PAHs	EPA Method SW-846 8270C-SIM (U.S. EPA 1997)
BTEX	EPA Method SW-846 8021B (U.S. EPA 1997)
Diesel- and residual-range organics	Alaska Department of Environmental Conservation Methods AK 102 and AK 103 (DEC 2002).
Mercury	EPA SW-846 Methods 7470A and 7471A (U.S. EPA 1997)
Fluoride	EPA SW-846 Method 340.2M (U.S. EPA 1983)
Total solids	EPA Method 160.3 (modified) (U.S. EPA 1983)

Note: BTEX - benzene, toluene, ethylbenzene, and xylenes
EPA - U.S. Environmental Protection Agency
PAH - polycyclic aromatic hydrocarbon
SIM - selective ion monitoring
SVOC - semivolatile organic compound

Samples were collected from June through September 2003.

The quality assurance review was conducted to verify that the laboratories' quality assurance and quality control procedures were documented and that the quality of the data is sufficient to support the use of the data for their intended purposes. The quality assurance review included evaluating the applicable quality control results reported by the laboratories.

All analyses were performed by Columbia Analytical Services, Inc., in Kelso, Washington, and North Creek Analytical Services in both Portland, Oregon, and Spokane, Washington.

Completeness

Results reported by the laboratories were 100 percent complete.

Holding Times and Sample Preservation

Holding time constraints were typically met for all samples. The 24-hour holding time constraint was not met for the analyses of mercury in sample delivery groups (SDGs) P3K0625 and P3K0626. As a result, all results reported for mercury in these two SDGs were qualified as estimated (*J*).

Analytical Methods

Analytical methods were completed in accordance with the methods listed in Table B-1.

Instrument Performance

The performance of the analytical instruments, as documented by the laboratories, was acceptable. No changes in instrument performance that would have resulted in the degradation of data quality were indicated during any sequence of analyses.

Initial and Continuing Calibration

Initial and continuing calibrations, as documented by the laboratories, were completed for all applicable target analytes and met the laboratories' criteria for acceptable performance and frequency of analysis.

Initial and Continuing Calibration Blanks

The initial and continuing calibration blank analyses, as documented by the laboratories, met the laboratories' criteria for acceptable performance and frequency of analyses.

Laboratory Blank Analyses

No analytes were detected in the laboratory blanks with the following exceptions:

- Selected results for antimony in SDG K2304926 and SDG K2304928 were restated as undetected (*U*) due to preparation blank contamination
- One result for tin in SDG K2305497 was restated as undetected (*U*) due to preparation blank contamination
- Selected results for antimony, barium, manganese, tin, and zinc in SDG K2305744 were restated as undetected (*U*) due to preparation blank contamination

- Selected results for tin in SDG K2305251 were restated as undetected (*U*) due to preparation blank contamination
- Selected results for aluminum, copper, chromium, and tin in SDG K2305504 were restated as undetected (*U*) due to preparation blank contamination
- Selected results for the polycyclic aromatic hydrocarbons (PAHs) indeno[1,2,3-cd]pyrene, benzo[ghi]perylene, and dibenz[a,h]perylene in SDG K230521 were restated as undetected (*U*) due to method blank contamination
- One result for the PAH phenanthrene in SDG K2305504 was restated as undetected (*U*) due to method blank contamination
- Selected results for toluene in SDG K2305503 were restated as undetected (*U*) due to method blank contamination
- Selected results for molybdenum in SDG P3K0625 were restated as undetected (*U*) due to method blank contamination
- Selected results for manganese and thallium in SDG P3J0486 were restated as undetected (*U*) due to method blank contamination
- Selected results for thallium in SDG P3J0481 were restated as undetected (*U*) due to method blank contamination
- Selected results for aluminum and thallium in SDG P3J0481 were restated as undetected (*U*) due to method blank contamination.

Instrument-Specific Quality Control Procedures

The results of the instrument-specific quality control procedures for metals analyses (interference check sample, correlation coefficients, and inductively coupled plasma serial dilution) met applicable control limits for acceptable performance and frequency of analysis requirements, with the following exceptions:

- The percent difference of iron in SDG K2305744 was above the control limit of 10 percent for the serial dilution. Associated sample results were qualified as estimated (assigned a *J* qualifier).
- The percent difference of strontium in SDG K2304931 was above the control limit of 10 percent for the serial dilution. Associated sample results were qualified as estimated (assigned a *J* qualifier).
- Sample SW0029 for copper in SDG K2305495 was qualified as estimated (*J*) because the correlation coefficient for the method of standard addition was less than 0.995.

Accuracy

The accuracy of the analytical results is evaluated in the following sections in terms of analytical bias (applicable surrogate compound, internal standard, and matrix spike and laboratory control sample [LCS] recoveries) and precision (applicable matrix spike duplicate and duplicate sample analyses).

Surrogate Compound Recoveries

The recoveries reported by the laboratories for surrogate compounds for all applicable analyses, and the frequency of analysis, met the criteria for acceptable performance with the following exceptions:

- Detected results reported for PAHs in two samples from SDG K2305251 were qualified as estimated (*J*) because two of the four surrogate recoveries were above the upper control limit
- Results reported for benzene, toluene, ethylbenzene, and xylenes for one sample in SDG K2305251 were qualified as estimated (*J*), because the recovery of the associated surrogate compound was below the laboratory-established control limit.

Internal Standards Performance

The area counts (or recoveries) and retention times of internal standards, and the frequency of analysis, met the laboratories' criteria for acceptable performance.

Matrix Spike Recoveries

The recoveries reported by the laboratories for matrix spike analyses, and the frequency of analysis, met the laboratories' criteria for acceptable performance, with the following exceptions:

- The recovery of arsenic in SDG K2304926 was not within the applicable control limits. All associated arsenic results were qualified as estimated (assigned a *J* qualifier).
- The recovery of antimony in SDG K2307380 was not within the applicable control limits. All associated antimony results were qualified as estimated (assigned a *J* qualifier).
- The recovery of antimony in SDG K2305251 was not within the applicable control limits. All associated antimony results were qualified as estimated (assigned a *J* qualifier).

- The recoveries of antimony and lead in SDG K2304928 were not within the applicable control limits. All associated antimony and lead results were qualified as estimated (assigned a *J* qualifier).
- The recovery of antimony in SDG K2305504 was not within the applicable control limits. All associated antimony results were qualified as estimated (assigned a *J* qualifier).
- The recoveries of antimony, barium, and cadmium in SDG K2305503 were not within the applicable control limits. All associated antimony, barium, and cadmium results were qualified as estimated (assigned a *J* qualifier).
- The recovery of total chloride in SDGs P3J0486, P3J0481, and P3J0350 was not within the applicable control limits. All associated total chloride results were qualified as estimated (assigned a *J* qualifier).

Laboratory Control Sample Recoveries

The recoveries reported by the laboratories for all LCS recoveries, and the frequency of analysis, met the laboratories' criteria for acceptable performance with the following exception:

- The recoveries for naphthalene, 2-methylnapthalene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene in SDG K2305503 were not within the laboratory-established control limits. All associated results for naphthalene, 2-methylnapthalene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene were qualified as estimated (*J*) during the quality assurance review.

Precision

Results for all duplicate sample analyses, and the frequency of analysis, met the laboratories' criteria for acceptable performance, with the following exceptions:

- The duplicate relative percent difference (RPD) for strontium in SDG K2304926 exceeded the control limit. All associated strontium results were qualified as estimated (assigned a *J* qualifier).
- The duplicate RPD for cadmium and lead in SDG K2305251 exceeded the control limit. All associated cadmium and lead results were qualified as estimated (assigned a *J* qualifier).
- The duplicate RPD for barium in SDG K2305497 exceeded the control limit. All associated barium results were qualified as estimated (assigned a *J* qualifier).

- The duplicate RPD for chromium, lead, and vanadium in SDG K2307380 exceeded the control limit. All associated chromium, lead, and vanadium results were qualified as estimated (assigned a *J* qualifier).
- The duplicate RPD for barium, cadmium, manganese, and nickel in SDG K2305504 exceeded the control limit. All associated barium, cadmium, manganese, and nickel results were qualified as estimated (assigned a *J* qualifier).
- The duplicate RPD for antimony, copper, lead, molybdenum, selenium, aluminum, cobalt, mercury, iron, thallium, and vanadium in SDG K2305503 exceeded the control limit. All associated results were qualified as estimated (assigned a *J* qualifier).

Quantitative Assessment

The laboratories' reported results as detected at a concentration above the method detection limit, but less than the method reporting limit. These results were assigned a *J* flag (for conventional and organic compounds) or a *B* flag (for metals) by the laboratories. During data validation, all of these laboratory-flagged results were qualified as estimated (*J*).

Qualitative Assessment

Results reported as detected for diesel- and residual-range organics were flagged by the laboratories to indicate that the constituent used for quantification did not adequately match the elution range of the standard for the specific petroleum product, and/or the sample appeared to be weathered. During data validation, all results reported as detected for these compounds were qualified as estimated (*J*).

Field Quality Control Samples

Field quality control samples consisted of trip blanks, field duplicate samples, filter blank samples, and equipment rinsate blanks.

The precision of all target analytes detected in the field duplicates was acceptable.

Certain analytes were reported as detected in the filter and equipment rinsate blanks. No action was required because the concentrations of the analytes detected in the natural samples were above the concentrations detected in the blanks.

Toluene was detected in two trip blanks. As a result, one associated equipment blank (EB011) was restated as undetected (*U*) and all other associated results were either non-detected for toluene or greater than the prescribed action limit for the data validation.

References

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