Summary of Changes: SOM02.3 to SOM02.4

The following Summary of Changes highlights the major modifications implemented in SOW SOM02.4 compared to SOW SOM02.3.

This is a high-level summary and is not intended to be a complete or comprehensive listing of every modification. Interested parties are strongly encouraged to read the complete SOW SOM02.4 and familiarize themselves with all of the requirements.

Global

References to "SOM02.3" have been updated to "SOM02.4".

Exhibit A

• **Section 5.4.4.6** – Requirements that the daily check of the infrared (IR) temperature detection device be documented and records maintained on file have been added.

Exhibit B

- Section 2.2.1 The instructions for data resubmission have been updated to indicate that
 corrected data submitted as "Additional Data" at the request of an EPA Regional data reviewer
 shall only include the affected pages and be accompanied by a revised Sample Delivery Group
 (SDG) Narrative documenting the reason(s) for the resubmittal.
- Sections 2.4.7.2.4.3, 2.4.7.3.3, 2.4.8.2.4.3, 2.4.8.3.3, 2.4.9.2.4.3, and 2.4.9.3.3 Language in these sections has been updated to specify that in all instances where manual integration or quantitation has been performed, the hardcopy printout(s) of the Extracted Ion Current Profiles (EICPs) of the quantitation ion displaying the original integration(s) shall be included in the raw data, in addition to the hardcopy printout(s) of the EICPs of the quantitation ion displaying the manual integration(s).
- Sections 2.4.7.3.1, 2.4.7.3.2, 2.4.8.3.1, 2.4.8.3.2, 2.4.9.3.1, and 2.4.9.3.2 Language in these sections has been updated to specify that the corresponding original system integration shall be included in the raw data, in addition to the EICPs displaying each manual integration.
- Sections 2.4.7.3.2, 2.4.8.3.2, and 2.4.9.3.2 Requirements have been specified for the submission of Form 7A-OR and associated raw data for the alternate source Initial Calibration Verification (ICV) standard for the Gas Chromatograph/Mass Spectrometer (GC/MS) methods.
- Sections 2.4.10.2.4.2, 2.4.10.3.3, 2.4.11.2.4.2, and 2.4.11.3.3 Language in these sections has been updated to specify that in all instances where manual integration or quantitation has been performed, the hardcopy printout(s) of the chromatograms displaying the original integration(s) shall be included in the raw data, in addition to the hardcopy printout(s) of the chromatograms displaying the manual integration(s).
- Sections 2.4.10.3.1, 2.4.10.3.2, 2.4.11.3.1, and 2.4.11.3.2 Language in these sections has been updated to specify that the corresponding original system integration shall be included in the raw data, in addition to the chromatograms displaying each manual integration.
- Section 2.6.2.1.2, Table 3 "Initial Calibration Verification" has been added to the list of child bookmarks associated with the Trace Volatile, Low/Medium Volatile, and Semivolatile Standards Data parent bookmark.

- **Section 2.7.1** "I certify that this data package is..." has been updated to "I certify that these Preliminary Results are..." in the statement on the SDG Cover Page that is to be submitted with the Preliminary Results.
- Section 3.3.7.1, Table 5 Table 5 (Codes for Labeling Data) has been updated to clarify that laboratory QC samples not part of the SDG are to be reported as "ZZZZZ"; Language for Footnote 6 has been added to clarify that instrument QC samples must not be reported as "ZZZZZ".
- **Section 3.3.7.1, Table 5** EPA Sample Number formats have been specified for the Volatile and Semivolatile alternate source ICV standards.
- **Section 3.3.22** "WDIL" has been included as the code for reporting the Waste Dilution extraction type on the applicable Summary Forms.
- Section 3.4.2.2.9 Form 1A-OR and Form 1B-OR reporting requirements have been updated as follows and a Note added:

Under column "Concentration", enter for each analyte, the value of the result if the concentration or mass is greater than or equal to the MDL <u>adjusted if necessary and</u> corrected for any dilutions. If the concentration is less than the MDL, enter the CRQL for the analyte, adjusted if necessary and corrected for any dilutions. The concentration or mass result shall be reported to two significant figures.

NOTE: For analytes in a sample that require more than one dilution, the compliant result from the least diluted analysis shall be considered as the best analytical result for the sample. For analytes in a sample that require dilution, reanalysis, or re-extraction, when none of the results from these analyses are compliant, the result from the initial analysis shall be considered as the best analytical result for the sample. For non-detected analytes that do not require any further dilution, reanalysis, or re-extraction, the CRQLs from the initial analysis shall be considered as the best analytical result.

• Section 3.4.9.2.2 – The reporting instructions for the date(s) of the initial calibration of the single component pesticides analytes on Form 6B-OR and Form 6C-OR have been clarified as follows: Enter the dates of the first and the last initial calibration (ICAL) standard analyses in the entire ICAL sequence [excluding the Resolution Check Standard (RESC), Performance Evaluation Mixture standard (PEM), and instrument blanks].

Note that the language in **Sections 3.4.14.2.1, 3.4.15.2.1, 3.4.16.2.1, and 3.4.18.2.1** has been updated to clarify that the dates specified in Section 3.4.9.2.2 above are also to be entered on Form 7B-OR, Form 7C-OR, Form 7D-OR, and Form 8B-OR.

- Section 3.4.9.2.3 The reporting instructions for the time(s) of the initial calibration of the single component pesticides analytes on Form 6B-OR and Form 6C-OR have been clarified as follows: Enter the times of the first and the last ICAL standard analyses in the entire ICAL sequence (excluding the RESC, PEM, and instrument blanks).
- **Section 3.4.13 and Associated Subsections** Instructions have been provided for reporting the GC/MS alternate source ICV standard data on Form 7A-OR.

Exhibit B - Forms

• Form 7A-OR — "Initial Calibration Verification" has been added to the form title. The new title is "Initial Calibration Verification and Continuing Calibration Verification for GC/MS".

 Form DC-2 – The Form 7A-OR title has been updated to "Initial Calibration Verification and Continuing Calibration Verification for GC/MS" for Categories 16, 32, and 48 under the Trace Volatiles, Low-Medium Volatiles, and Semivolatiles Standards Data sections, respectively.

Exhibit C

- **Section 3.0, Table 3** Hexachlorobenzene and Pentachlorophenol have been designated as Toxicity Characteristic Leaching Procedure (TCLP) analytes.
- Section 4.0, Table 4 Endrin has been designated as a TCLP analyte.

Exhibit D - Introduction

• **Section 4.0** – Language has been added stating that stock solutions that are past the manufacturer's expiration date shall not be used to prepare analytical standards.

Exhibit D - General

- **Section 6.2.5** Language has been added to clarify that manufacturer's instructions are to be followed for the calibration and maintenance of adjustable pipettes.
- Section 7.1.1 The reagent water requirements have been updated to include the following:
 For the preparation of pH buffer solutions, it may be necessary to boil and cool the water prior to use.
- Section 8.3 The contract holding time requirements have been clarified as follows: The holding time for ZHE extraction of volatile soil samples or waste samples containing ≥ 0.5% solids is 10 days from Validated Time of Sample Receipt (VTSR). The holding time for TCLP or SPLP extraction of non-volatile soil samples or waste samples containing ≥ 0.5% solids is 10 days from VTSR. The holding time for TCLP or SPLP filtration of aqueous samples is 5 days from VTSR.

Exhibit D - Trace VOA

- Sections 6.3 and 9.0 and Associated Subsections The requirements for analytical instrumentation and instructions for instrument calibration/standardization have been updated, wherever applicable, to include the alternate source ICV standard.
- **New Sections 7.2.2.2 and 9.4** Instructions and requirements have been provided for the preparation and analysis of an ICV standard that is to consist of a solution from a different source or lot than that used for the ICAL standard.
- Section 7.2.2.4 The instructions for the preparation of the Deuterated Monitoring Compound (DMC) spiking solution have been updated to specify that the DMCs are to also be added to alternate source ICV standard.
- New Section 9.5.6.4 The corrective action for sample reanalysis is not required when the
 noncompliant analytes or associated Deuterated Monitoring Compounds (DMCs), in the opening
 or closing Continuing Calibration Verification (CCV) standards bracketing a dilution or a
 reanalysis, are not the same analytes or associated DMCs for which the dilution or reanalysis
 was intended.
- **Section 11.0 and Associated Subsections** The Data Analysis and Calculations requirements have been updated, wherever applicable, to include the alternate source ICV standard.

- Section 11.2.1.6 Language has been updated to specify that in all instances where manual integration or quantitation has been performed, the hardcopy printout(s) of the EICPs of the quantitation ion displaying the original integration(s) shall be included in the raw data, in addition to the hardcopy printout(s) of the EICPs of the quantitation ion displaying the manual integration(s).
- Section 11.4.4 and Associated Subsections The corrective actions to be taken when the DMCs and/or Internal Standards (ISs) do not meet the technical acceptance criteria in a sample have been clarified.
- New Section 11.4.8 The Sample Management Office (SMO) shall be contacted if the required corrective actions for sample reanalysis and/or dilution cannot be performed due to insufficient sample volume.
- **Section 12.0 and Associated Subsections** The Quality Control requirements have been updated, wherever applicable, to include the alternate source ICV standard.
- **Section 17.0, Table 4** The technical acceptance criteria (Minimum RRF, Maximum %RSD, and Maximum %D) for the alternate source ICV standard have been included in the table.

Exhibit D - Low/Medium VOA

- Sections 6.3 and 9.0 and Associated Subsections The requirements for analytical instrumentation and instructions for instrument calibration/standardization have been updated, wherever applicable, to include the alternate source ICV standard.
- **New Sections 7.2.2.2 and 9.4** Instructions and requirements have been provided for the preparation and analysis of an ICV standard that is to consist of a solution from a different source or lot than that used for the ICAL standard.
- Section 7.2.2.4 The instructions for the preparation of the Deuterated Monitoring Compound (DMC) spiking solution have been updated to specify that the DMCs are to also be added to alternate source ICV standard.
- Section 8.3 The contract required holding time requirements have been clarified as follows:
 Analysis of water and soil/sediment samples must be completed within 10 days of Validated
 Time of Sample Receipt (VTSR). Analysis of unpreserved, unfrozen soil/sediment samples must
 be completed within 24 hours of VTSR. The holding time for the analysis of TCLP or SPLP
 filtrates and leachates is 7 days from the completion of the TCLP or SPLP filtration and extraction
 procedures.
- **New Section 9.5.6.4** The corrective action for sample reanalysis is not required when the noncompliant analytes or associated DMCs, in the opening or closing CCVs bracketing a dilution or a reanalysis, are not the same analytes or associated DMCs for which the dilution or reanalysis was intended.
- **Section 11.0 and Associated Subsections** The Data Analysis and Calculations requirements have been updated, wherever applicable, to include the alternate source ICV standard.
- Section 11.2.1.6 Language has been updated to specify that in all instances where manual integration or quantitation has been performed, the hardcopy printout(s) of the EICPs of the quantitation ion displaying the original integration(s) shall be included in the raw data, in addition to the hardcopy printout(s) of the EICPs of the quantitation ion displaying the manual integration(s).

- **Section 11.4.4 and Associated Subsections** The corrective actions to be taken when the DMCs and/or ISs do not meet the technical acceptance criteria in a sample have been clarified.
- **New Section 11.4.8** SMO shall be contacted if the required corrective actions for sample reanalysis and/or dilution cannot be performed due to insufficient sample volume.
- **Section 12.0 and Associated Subsections** The Quality Control requirements have been updated, wherever applicable, to include the alternate source ICV standard.
- **Section 17.0, Table 4** The technical acceptance criteria (Minimum RRF, Maximum %RSD, and Maximum %D) for the alternate source ICV standard have been included in the table.

Exhibit D - SVOA

- **Section 6.1.12** Language has been added to clarify that manufacturer's instructions are to be followed for the calibration and maintenance of adjustable pipettes.
- Sections 6.3 and 9.0 and Associated Subsections The requirements for analytical
 instrumentation and instructions for instrument calibration/standardization have been updated,
 wherever applicable, to include the alternate source ICV standard.
- New Sections 7.2.2.2 and 9.4 Instructions and requirements have been provided for the
 preparation and analysis of an ICV standard that is to consist of a solution from a different
 source or lot than that used for the ICAL standard.
- Section 7.2.2.7.1 The third sentence regarding the preparation of the internal standard spiking solution has been updated to: Just prior to full scan analysis by GC/MS, add sufficient amount of the internal standard spiking solution to an aliquot of the water, low-level, or medium-level soil sample extracts for the initial analysis, dilution, and reanalysis, or to the re-extracts if applicable, to result in a 20 ng/μL concentration of each internal standard.
- Section 7.2.2.7.2 The first sentence regarding the preparation of the internal standard spiking solution has been updated to: If the optional analysis of PAHs and PCP using the SIM analysis is to be performed, the Contractor shall add sufficient amount of the internal standard spiking solution to an aliquot of the water or low-level sample extracts for the initial analysis, dilution, and reanalysis, or to the re-extracts if applicable, just prior to SIM analysis to result in a 0.40 ng/μL concentration of each internal standard.
- New Section 9.5.6.4 The corrective action for sample reanalysis is not required when the
 noncompliant analytes or associated DMCs, in the opening or closing CCVs bracketing a dilution,
 a re-extraction, or a reanalysis, are not the same analytes or associated DMCs for which the
 dilution, re-extraction, or reanalysis was intended.
- **Section 11.0 and Associated Subsections** The Data Analysis and Calculations requirements have been updated, wherever applicable, to include the alternate source ICV standard.
- Section 11.2.1.3 Language has been updated to specify that in all instances where manual integration or quantitation has been performed, the hardcopy printout(s) of the EICPs of the quantitation ion displaying the original integration(s) shall be included in the raw data, in addition to the hardcopy printout(s) of the EICPs of the quantitation ion displaying the manual integration(s).
- **Section 11.4.4 and Associated Subsections** The corrective actions to be taken when the DMCs and/or ISs do not meet the technical acceptance criteria in a sample have been clarified.

- New Section 11.4.6 SMO shall be contacted if the required corrective actions for sample re-extraction, reanalysis, and/or dilution cannot be performed due to insufficient sample volume.
- **Section 12.0 and Associated Subsections** The Quality Control requirements have been updated, wherever applicable, to include the alternate source ICV standard.
- Section 17.0, Table 3 Target analytes Hexachlorocyclopentadiene associated with 2,4-Dichlorophenol-d₃ (DMC-9) and 3,3'-Dichlorobenzidine associated with Benzo(a)pyrene-d₁₂ (DMC-17) have been deleted from this table so that they are only associated with Nitrobenzene-d₅ (DMC-7) in this table.
- **Section 17.0, Table 5** The technical acceptance criteria (Minimum RRF, Maximum %RSD, and Maximum %D) for the alternate source ICV standard have been included in the table.
- Section 17.0, Table 10 DMC 4, 6-Dinitro-2-methylphenol-d₂ associated with Internal Standard Phenanthrene-d₁₀ has been deleted, and DMC 2,4-Dichlorophenol-d₃ has been added under Internal Standard Naphthlene-d₃ for consistency with Section 17.0, Tables 3 and 9.

Exhibit D - PEST

- **Section 6.1.12** Language has been added to clarify that manufacturer's instructions are to be followed for the calibration and maintenance of adjustable pipettes.
- Section 8.3.1 The contract required holding time requirements have been clarified as follows:
 Extraction of water samples by separatory funnel procedures must be completed within 5 days
 of the Validated Time of Sample Receipt (VTSR). Extraction of water samples by continuous
 liquid-liquid extraction must be started within 5 days of VTSR. Extraction of the TCLP or SPLP
 filtrates and leachates shall begin within 7 days of completion of the filtration and leaching
 procedures. Extraction of soil/sediment samples shall be completed within 10 days of VTSR.
- New Section 9.4.6.9 The corrective action for sample reanalysis is not required when the
 noncompliant analytes or surrogates, in the opening or closing CCVs bracketing a dilution, a
 re-extraction, or a reanalysis, are not the same analytes or surrogates for which the dilution,
 re-extraction, or reanalysis was intended.
- Section 10.3.1.4.4 The Percent Recovery (%R) limits of each analyte in the Gel Permeation Chromatography (GPC) calibration verification standard have been updated from "80-120%" to "80-110%" for consistency with the values in Section 17.0, Table 9.
- Section 11.2.1.3 The following Note has been added: In all instances where the data system report has been edited, or where manual integration or quantitation has been performed, the GC instrument operator shall identify such edits or manual procedures by initialing and dating the changes made to the report, and shall include the properly scaled raw chromatogram that clearly shows the manual integration. The GC instrument operator shall also mark each integrated area with the letter "m" on the quantitation report, and initial and date the changes. The hardcopy printout(s) of the chromatograms displaying the original integration(s) shall be included in the raw data, in addition to the hardcopy printout(s) of the chromatograms displaying the manual integration(s). This applies to all target analytes listed in Exhibit C Organic Target Analyte List and Contract Required Quantitation Limits, Table 4 Pesticides Target Analyte List and Contract Required Quantitation Limits, and surrogates.

 New Section 11.4.6 – SMO shall be contacted if the required corrective actions for sample re-extraction, reanalysis, and/or dilution cannot be performed due to insufficient sample volume.

Exhibit D - ARO

- **Sections 6.1.12 and 6.2.12.1** Language has been added to clarify that manufacturer's instructions are to be followed for the calibration and maintenance of adjustable pipettes.
- New Section 9.4.6.9 The corrective action for sample reanalysis is not required when the
 noncompliant analytes or surrogates, in the opening or closing CCVs bracketing a dilution, a
 re-extraction, or a reanalysis, are not the same analytes or surrogates for which the dilution,
 re-extraction, or reanalysis was intended.
- **Section 10.1.1.2.1** The order of pH adjustment and addition of solvent has been changed.
- Section 11.2.1.3 The following Note 2 has been added: In all instances where the data system report has been edited, or where manual integration or quantitation has been performed, the GC instrument operator shall identify such edits or manual procedures by initialing and dating the changes made to the report, and shall include the properly scaled raw chromatogram that clearly shows the manual integration. The GC instrument operator shall also mark each integrated area with the letter "m" on the quantitation report, and initial and date the changes. The hardcopy printout(s) of the chromatograms displaying the original integration(s) shall be included in the raw data, in addition to the hardcopy printout(s) of the chromatograms displaying the manual integration(s). This applies to all target analytes listed in Exhibit C Organic Target Analyte List and Contract Required Quantitation Limits, Table 5 Aroclors Target Analyte List and Contract Required Quantitation Limits, and surrogates.
- New Section 11.4.6 SMO shall be contacted if the required corrective actions for sample re-extraction, reanalysis, and/or dilution cannot be performed due to insufficient sample volume.

Exhibit F

 Section 8.2.2 – The language pertaining to the content of the raw data files that are to be submitted during electronic data audits has been updated to include the GC/MS alternate source ICV standard data.

Exhibit H

- Section 2.2.2 The rounding requirements have been clarified as follows: The values reported by the Contractor are used for data assessment. No raw data values in the SEDD files shall be rounded. The Contractor shall not use rounded intermediate values in calculating the final result, and no rounding shall be performed until reaching the final result.
- **Section 3.1.5** The ICV has been added to the list of instrument QC samples that must be reported as an InstrumentQC node under each Header node.
- **Section 3.1.7** The requirements for the Analysis node associated with an initial analysis, dilution, or reanalysis have been clarified as follows:
 - Each SamplePlusMethod must contain at least one Analysis node for Gas Chromatograph/Mass Spectrometer (GC/MS) methods or must contain at least two Analysis nodes for GC methods with confirmation (one for each column). Separate Analysis nodes are required for each

dilution, re-extraction, or reanalysis. Any reanalysis must be preceded by an initial analysis. Any analysis reported as a dilution must also have a less-diluted analysis reported as initial. The initial analysis does not have to precede the diluted analysis.

Each Instrument QC node (other than Initial Calibration) must contain one Analysis node for GC/MS methods or must contain at least two Analysis nodes for GC methods with confirmation (one for each column).

- **Section 7.0, Tables 1 and 2** The "Applicability" column has been updated to include the GC/MS alternate source ICV standard.
- Section 7.0, Tables 1, 2, and 3 The Instructions for the ClientMethodCode element under the SamplePlusMethod node have been updated from "Not required" to "Report "PAH", "TCLP" or "SPLP" when applicable".
- Section 7.0, Tables 4, 5, and 6 The Instructions for the ClientMethodCode element under the SamplePlusMethod node have been updated from "Not required" to "Report "TCLP" or "SPLP" when applicable".
- Section 7.0, Tables 1, 2, and 3 The Applicability of the Original Client Sample ID element under the Sample Plus Method node has been revised to include the "Sample", and the Instructions have been updated to: Report the EPA Sample Number of the original sample this sample was derived from. Report the EPA sample number used for the low level sample analysis for the volatiles and semivolatiles medium level samples, if applicable. Leave blank if only the medium level analysis is performed for the sample.
- Section 7.0, Tables 1, 2, 3, 4, 5, and 6 "Report "None" if sample was not preserved" has been added to the Instructions for the Preservative element under the SamplePlusMethod node.
- Section 7.0, Tables 1, 2, 3, 4, 5, and 6 "Tissue samples do not require "Percent_Solids" or "pH"" has been added to the Instructions for the CharacteristicType element under the SamplePlusMethod/Characteristic node.
- Section 7.0, Tables 1, 2, 3, 4, 5, and 6 The Instructions for the CharacteristicValue element under the SamplePlusMethod/Characteristic node have been updated to: For "Percent_Solids", report "0.0" for aqueous/water samples including QC samples; report the percent solids to two significant figures if less than 10 and three significant figures if greater than or equal to 10 for soil/sediment samples including QC samples. For "pH", report the pH to the nearest tenth for aqueous/water samples (and soil/sediment samples as requested). For "Temperature", report the temperature at receipt to the nearest degree for aqueous/water and soil/sediment samples received at the laboratory.
- Section 7.0, Tables 1, 2, 3, 4, 5, and 6 "Report "Wet" for tissue samples or for any other
 matrices for which the results are not corrected for percent solids" has been added to the
 Instructions for the ResultBasis element under the SamplePlusMethod/Analysis node.
- Section 7.0, Tables 1, 2, 3, 4, 5, and 6 "Report "Waste_Dilution" for waste dilution" has been added to the Instructions for the PreparationType element under the SamplePlusMethod/ Analysis/PreparationPlusCleanup node.
- Section 7.0, Tables 1, 2, 3, 4, 5, and 6 The Instructions for the DetectionLimit element under the SamplePlusMethod/Analysis/Analyte node have been updated from "Report the MDL" to "Report the MDL to at least two significant figures".

- **Section 7.0, Tables 1 and 4** "Unadjusted for sample weight/volume, percent solids, or dilution factor" has been added to the Instructions for the IntermediateResult element under the SamplePlusMethod/Analysis/Analyte node.
- Section 7.0, Tables 1 and 2 The Instructions for the ClientMethodCode element under the
 InstrumentQC node have been updated from "Not required" to "Report "PAH", "TCLP", or
 "SPLP" when applicable".
- Section 7.0, Tables 4 and 5 The Instructions for the ClientMethodCode element under the InstrumentQC node have been updated from "Not required" to "Report "TCLP" or "SPLP" when applicable".
- Section 7.0, Tables 1, 2, 4, and 5 The Instructions for the ClientMethodModificationID element under the InstrumentQC node have been updated from "Not required" to "Report the Modified Analysis Number, if applicable".
- **Section 7.0, Tables 1 and 2** "Initial Calibration Verification for ICV" has been added to the Instructions for the QCType element under the InstrumentQC node.
- Section 7.0, Tables 1 and 2 The Instructions for the ExpectedResult element under the InstrumentQC/Analysis/Analyte node have been updated to "Report the final amount for all applicable target analytes, DMCs, and internal standards".
- Section 7.0, Tables 4 and 5 The Instructions for the ExpectedResult element under the InstrumentQC/Analysis/Analyte node have been updated to "Report the final amount for all applicable target analytes and surrogates".
- Section 7.0, Tables 1 and 4 "Unadjusted for sample weight/volume, percent solids, or dilution factor" has been added to the Instructions for the IntermediateResult element under the InstrumentQC/Analysis/Analyte node.
- Section 7.0, Table 4 "Leave blank if compound not detected" has been deleted from the Instructions for the IntermediateResult element under the InstrumentQC/Analysis/Analyte/Peak node.
- Appendix A, Table A-1 "ReportedResult/DetectionLimit" has been replaced with
 "Analysis/Analyte/DetectionLimit" in the Instructions for the "DetectionLimit" column in the
 MDL study data deliverable table.
- Appendix A, Table A-1 "ReportedResult/DetectionLimitUnits" has been replaced with
 "Analysis/Analyte/DetectionLimitUnits" in the Instructions for the "DetectionLimitUnits" column
 in the MDL study data deliverable table.