

Memorandum

Date: 28 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-79394-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of six solid samples collected June 28, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-79394-1	SSHS-B1234-SUB-4-6
180-79394-2	SSHS-B1234-SUB-8-10

Laboratory ID	Client ID
180-79394-3	SSHS-B1084-SUB-8-10
180-79394-4	SSHS-B1229-SUB-2-4

Laboratory ID	Client ID
180-79394-5	SSHS-B1088-SUB-6-8

Laboratory ID	Client ID
180-79394-6	SSHS-B1072-SUB-2-4

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issues were noted with the chain of custody (COC) forms:

- Incorrect error corrections were observed on the COCs, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.
- Samples PILE 102, PILE 102-A, PILE 102-B, PILE 102-C, PILE 102-D and Trip Blank were listed on the COC but were reported in laboratory reports 180-79394-2 and 180-79394-3.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1234-SUB-4-6	PCB-1248	3500	NA	3500	J	13
SSHS-B1234-SUB-4-6	PCB-1254	3800	NA	3800	J	13
SSHS-B1234-SUB-4-6	PCB-1260	460	F1	460	J	13
SSHS-B1234-SUB-8-10	PCB-1254	3600	NA	3600	J	13
SSHS-B1234-SUB-8-10	PCB-1260	300	NA	300	J	13
SSHS-B1084-SUB-8-10	PCB-1248	380	NA	380	J	13
SSHS-B1084-SUB-8-10	PCB-1254	710	NA	710	J	13
SSHS-B1084-SUB-8-10	PCB-1260	66	NA	66	J	13
SSHS-B1229-SUB-2-4	PCB-1248	45000	NA	45000	J	13
SSHS-B1229-SUB-2-4	PCB-1254	17000	NA	17000	J	13
SSHS-B1229-SUB-2-4	PCB-1260	1100	NA	1100	J	13
SSHS-B1088-SUB-6-8	PCB-1248	2000	NA	2000	J	13
SSHS-B1088-SUB-6-8	PCB-1254	870	NA	870	J	13
SSHS-B1088-SUB-6-8	PCB-1260	88	NA	88	J	13

µg/kg-microgram per kilogram

F1-laboratory flag indicating MS and/or MSD recovery was outside acceptance limits

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 249126). PCBs were not detected in the method blank above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One MS/MSD pair was reported using sample SSHS-B1234-SUB-4-6. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria, with the following exceptions.

The MS/MSD recoveries of PCB 1260 were low and outside the laboratory specified acceptance criteria. Therefore, the PCB 1260 and PCB 1254 concentrations were J qualified as estimated and the nondetect PCB 1262 and PCB 1268 results were UJ qualified as estimated less than the MDLs, based on professional and technical judgment.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Qualifier	Validation Result (µg/kg)	Reason Code
SSHS-B1234-SUB-4-6	PCB-1254	3800	NA	3800	J	4
SSHS-B1234-SUB-4-6	PCB-1260	460	F1	460	J	4
SSHS-B1234-SUB-4-6	PCB-1262	13	U	13	UJ	4
SSHS-B1234-SUB-4-6	PCB-1268	9.1	U	9.1	UJ	4

µg/kg-microgram per kilogram

U-not detected at or above the MDL

F1-laboratory flag indicating MS and/or MSD recovery was outside acceptance limits

NA-not applicable

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported, with the following exceptions.

The surrogates were not recovered (0% recovery) in sample SSHS-B1229-SUB-2-4. Based on the level the sample and surrogates were diluted and professional and technical judgment, no qualifications were applied to the data.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Field Duplicate

Field duplicates were not collected with the sample set.

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilution analyzed.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 28 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-79432-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of sixteen solid samples including one sample for matrix spike/matrix spike duplicate (MS/MSD) pair analyses, and two field duplicate samples collected June 29, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-79432-1	SSHS-B1248-SUB-10-12

Laboratory ID	Client ID
180-79432-2	SSHS-B1214-SUB-4-6

Laboratory ID	Client ID
180-79432-3	SSHS-B1216-SUB-4-6
180-79432-4	SSHS-B1242-SUB-6-8
180-79432-5	SSHS-B1202-SUB-2-4
180-79432-6	SSHS-B1202-SUB-4-6
180-79432-7	SSHS-B1064-SUB-4-6
180-79432-8	SSHS-B1243-SUB-6-8
180-79432-9	SSHS-B1109-SUB-8-10
180-79432-10	SSHS-B1074-SUB-2-4
180-79432-11	PS-FD-5

Laboratory ID	Client ID
180-79432-12	PS-FD-4
180-79432-13	SSHS-B1080B-SUB-6-8
180-79432-13 MS	SSHS-B1080B-SUB-6-8 MS
180-79432-13 MSD	SSHS-B1080B-SUB-6-8 MSD
180-79432-14	SSHS-B1194-SUB-4-6
180-79432-15	SSHS-B1231-SUB-4-6
180-79432-16	SSHS-B1076-SUB-2-4
180-79432-17	SSHS-B1226-SUB-2-4
180-79432-18	SSHS-B1232-SUB-4-6

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issues were noted with the chain of custody (COC) forms:

- Incorrect error corrections were observed on the COC, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.
- No collection times were documented on the COC for the field duplicate samples. The laboratory assigned collection times of 00:00.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ⊗ Field Duplicate

- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 **Overall Assessment**

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- One PCB 1254 peak had a %D that was outside the method specified acceptance criteria on gas chromatography (GC) column CLP2 in a CCV in batch 249261 (CCV 180-249261/1). Since the results for PCB 1254 in the associated samples were reported from the other GC column, which had an acceptable %D, no qualifications were applied to the data.
- One PCB 1248 peak had a %D that was outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 249419 (CCV 180-249419/4). Since the results for PCB 1248 in the associated samples were reported from the other GC column, which had an acceptable %D, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1248-SUB-10-12	PCB-1248	3600	NA	3600	J	13
SSHS-B1248-SUB-10-12	PCB-1254	1400	NA	1400	J	13
SSHS-B1248-SUB-10-12	PCB-1260	340	NA	340	J	13
SSHS-B1214-SUB-4-6	PCB-1248	13000	NA	13000	J	13
SSHS-B1214-SUB-4-6	PCB-1254	6300	NA	6300	J	13
SSHS-B1214-SUB-4-6	PCB-1260	790	NA	790	J	13
SSHS-B1216-SUB-4-6	PCB-1248	1000	NA	1000	J	13
SSHS-B1216-SUB-4-6	PCB-1254	590	NA	590	J	13

Former Sperry Remington Site-North

28 November 2018

Page 4

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1216-SUB-4-6	PCB-1260	210	NA	210	J	13
SSHS-B1242-SUB-6-8	PCB-1248	1200	NA	1200	J	13
SSHS-B1242-SUB-6-8	PCB-1254	550	NA	550	J	13
SSHS-B1242-SUB-6-8	PCB-1260	190	NA	190	J	13
SSHS-B1202-SUB-2-4	PCB-1248	1400	NA	1400	J	13
SSHS-B1202-SUB-2-4	PCB-1254	550	NA	550	J	13
SSHS-B1202-SUB-2-4	PCB-1260	140	NA	140	J	13
SSHS-B1202-SUB-4-6	PCB-1248	240	NA	240	J	13
SSHS-B1202-SUB-4-6	PCB-1254	69	NA	69	J	13
SSHS-B1202-SUB-4-6	PCB-1260	18	J	18	J	13
SSHS-B1064-SUB-4-6	PCB-1248	2400	NA	2400	J	13
SSHS-B1064-SUB-4-6	PCB-1254	980	NA	980	J	13
SSHS-B1064-SUB-4-6	PCB-1260	200	NA	200	J	13
SSHS-B1243-SUB-6-8	PCB-1248	420	NA	420	J	13
SSHS-B1243-SUB-6-8	PCB-1254	360	NA	360	J	13
SSHS-B1243-SUB-6-8	PCB-1260	140	NA	140	J	13
SSHS-B1109-SUB-8-10	PCB-1248	93	NA	93	J	13
SSHS-B1109-SUB-8-10	PCB-1254	33	NA	33	J	13
SSHS-B1109-SUB-8-10	PCB-1260	12	J	12	J	13
SSHS-B1074-SUB-2-4	PCB-1248	120	NA	120	J	13
SSHS-B1074-SUB-2-4	PCB-1254	92	NA	92	J	13
PS-FD-5	PCB-1248	240	NA	240	J	13
PS-FD-5	PCB-1254	220	NA	220	J	13
PS-FD-4	PCB-1248	11000	NA	11000	J	13
PS-FD-4	PCB-1254	4800	NA	4800	J	13
PS-FD-4	PCB-1260	670	NA	670	J	13
SSHS-B1194-SUB-4-6	PCB-1248	84	NA	84	J	13
SSHS-B1194-SUB-4-6	PCB-1254	43	NA	43	J	13
SSHS-B1231-SUB-4-6	PCB-1254	390	NA	390	J	13
SSHS-B1231-SUB-4-6	PCB-1260	68	NA	68	J	13
SSHS-B1232-SUB-4-6	PCB-1248	7400	NA	7400	J	13
SSHS-B1232-SUB-4-6	PCB-1254	5200	NA	5200	J	13
SSHS-B1232-SUB-4-6	PCB-1260	1000	NA	1000	J	13

µg/kg-microgram per kilogram

J-the result is less than the reporting limit (RL) but greater than the method detection limit (MDL) and the concentration is an approximate value

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 249186). PCBs were not detected in the method blank above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One MS/MSD pair was reported using sample SSHS-B1080B-SUB-6-8. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria, with the following exception.

The MS recovery of PCB 1016 was high and outside the laboratory specified acceptance criteria. Since, the PCB 1016, PCB 1221, PCB 1232, PCB 1242 and PCB 1248 were not detected in sample SSHS-B1080B-SUB-6-8, no qualifications were applied to the data.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported, with the following exceptions.

The tetrachloro-m-xylene recovery on GC column CLP2 in sample SSHS-B1242-SUB-6-8 was high and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Field Duplicate

Two field duplicates, PS-FD-5 and PS-FD-4, were collected with the sample set. Acceptable precision [RPD <50% for results greater than five times the RL] was demonstrated between the field duplicates and the original samples SSHS-B1074-SUB-2-4 and SSHS-B1214-SUB-4-6, respectively, with the following exceptions.

The RPDs of PCB 1248 and PCB 1254 were greater than 50% in field duplicate pair SSHS-B1074-SUB-2-4/PS-FD-5; one or both concentration in the field duplicate pair were greater than five times the RL. Therefore, based on professional and technical judgment, the PCB 1248 and 1254 concentrations in field duplicate pair SSHS-B1074-SUB-2-4/PS-FD-5 were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier	Reason Code
SSHS-B1074-SUB-2-4	PCB-1248	120	NA	67	J	7
PS-FD-5	PCB-1248	240	NA		J	7
SSHS-B1074-SUB-2-4	PCB-1254	92	NA	82	J	7
PS-FD-5	PCB-1254	220	NA		J	7

µg/kg-microgram per kilogram

NA-not applicable

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilutions analyzed.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram
NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 28 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverables, TestAmerica
Job IDs 180-79440-1, 180-79440-2, 180-79440-3 and 180-79440-4**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of thirty-four solid samples, including three samples for matrix spike/matrix spike duplicate (MS/MSD) analyses and five field duplicate samples, collected June 30 – July 2, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Metals by EPA Methods 3050B/6010C
- Mercury by EPA Method 7471B
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review, January 2017 (EPA 540-R-2017-001), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-79440-1	SSHS-B1230-SUB-2-4
180-79440-2	SSHS-B1215-SUB-4-6
180-79440-3	SSHS-B1221-SUB-6-8
180-79440-4	SSHS-B1077-SUB-2-4
180-79440-5	SSHS-B1160-SUB-10-12
180-79440-6	SSHS-B1105-SUB-4-6
180-79440-7	SSHS-B1203-SUB-2-4
180-79440-8	SSHS-B1240-SUB-4-6
180-79440-9	SSHS-B1079-SUB-4-6
180-79440-10	SSHS-B1244-SUB-6-8
180-79440-10 MS	SSHS-B1244-SUB-6-8 MS
180-79440-10 MSD	SSHS-B1244-SUB-6-8 MSD
180-79440-11	PS-FD-7
180-79440-12	PS-FD-6
180-79440-13	SSHS-B1204-SUB-2-4
180-79440-14	SSHS-B1219-SUB-4-6
180-79440-15	SSHS-B1219-SUB-10-12
180-79440-16	SSHS-B1068-SUB-4-6
180-79440-17	SSHS-B1068-SUB-10-12
180-79440-18	SSHS-B1224-SUB-6-8
180-79440-19	SSHS-B1224-SUB-8-10
180-79440-20	SSHS-B1251-SUB-10-12
180-79440-21	SSHS-B1254-SUB-10-12
180-79440-22	SSHS-B1254-SUB-12-14

Laboratory ID	Client ID
180-79440-22 MS	SSHS-B1254-SUB-12-14 MS
180-79440-22 MSD	SSHS-B1254-SUB-12-14 MSD
180-79440-23	SSHS-B1252-SUB-10-12
180-79440-24	PS-MET-DUP-1
180-79440-25	SSHS-B1236-SUB-4-6
180-79440-26	SSHS-B1236-SUB-6-8
180-79440-27	SSHS-B1223-SUB-6-8
180-79440-28	SSHS-B1235-SUB-4-6
180-79440-29	SSHS-B1237-SUB-4-6
180-79440-30	SSHS-B1237-SUB-8-10
180-79440-31	SSHS-B1075-SUB-2-4
180-79440-32	SSHS-B1078-SUB-2-4
180-79440-32 MS	SSHS-B1078-SUB-2-4 MS
180-79440-32 MSD	SSHS-B1078-SUB-2-4 MSD
180-79440-33	SSHS-B1206-SUB-2-4
180-79440-34	SSHS-B1206-SUB-4-6
180-79440-35	SSHS-B1220-SUB-6-8
180-79440-36	FD-1
180-79440-37	SSHS-B1207-SUB-2-4
180-79440-38	SSHS-B1233-SUB-4-6
180-79440-39	FD-2

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issues were noted with the chain of custody (COC) forms:

- Incorrect error corrections were observed on the COC, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.
- No collection times were documented on the COCs for the field duplicate samples. The laboratory assigned collection times of 00:00.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- One PCB 1260 peak %D and the surrogate decachlorobiphenyl %D were outside the method specified acceptance criteria on gas chromatography (GC) column CLP2 in a CCV in batch 249621 (CCV 180-249621/5). Since PCB 1260 and surrogate decachlorobiphenyl were reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.
- The PCB 1248 %Ds in a CCV in batch 250038 (CCV 180-250038/4) were outside the method specified acceptance criteria on both GC columns. Since the samples with PCB 1248 concentrations were reanalyzed and reported from batch 250307 with a passing %D, no qualifications were applied to the data.

- One PCB 1260 peak had a %D that was outside the method specified acceptance criteria on GC column CLP-1 in a CCV in batch 250038 (CCV 180-250038/5). Since the PCB 1260 concentrations in the associated samples were reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

In addition, three PCB concentrations were flagged with p, indicating that the relative percent difference (RPD) between the primary and confirmation GC columns was >40%; the lower value was reported. Therefore, based on professional and technical judgment, the concentrations of PCB 1260 in these samples were J qualified as estimated.

These qualifications are summarized in Attachment 3.

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Three method blanks were reported (batches 249583, 249584 and 249819). PCBs were not detected in the method blanks above the method detection limits (MDLs).

1.4 Matrix Spike/Matrix Spike Duplicate

Two sample set specific MS/MSD pairs were reported, using samples SSHS-B1244-SUB-6-8 and SSHS-B1078-SUB-2-4. The recovery and RPD results were within the laboratory specified acceptance criteria. with the following exceptions.

The PCB 1016 and PCB 1260 MS/MSD recoveries and PCB 1016 RPD were high and outside the laboratory specified acceptance criteria in the MS/MSD pair using sample SSHS-B1078-SUB-2-4. However, based on the contribution from PCB 1248, PCB 1254 and PCB 1260 from the sample and professional and technical judgment, no qualifications were applied to the data.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs and one LCS/LCS duplicate (LCSD) pair were reported. The recovery and RPD results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported, with the following exceptions.

The tetrachloro-m-xylene recoveries on both GC columns in sample SSHS-B2050-SUB-2-4 were low and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Field Duplicate

The following five field duplicate samples were collected with the sample sets.

PS-FD-7	SSHS-B1079-SUB-4-6
PS-FD-6	SSHS-B1215-SUB-4-6
PS-MET-DUP-1	SSHS-B1252-SUB-10-12
FD-1	SSHS-B1223-SUB-6-8
FD-2	SSHS-B1233-SUB-4-6

Acceptable precision [RPD <50% for results greater than five times the reporting limit (RL)] was demonstrated between the field duplicates and the original samples indicated in the table below, with the following exception.

The RPDs for PCB 1248 in field duplicate pair SSHS-B1215-SUB-4-6/PS-FD-6 was greater than 50%; both concentrations in each field duplicate pair were greater than the five times the RL. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248 in field duplicate pair SSHS-B1215-SUB-4-6/PS-FD-6 were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	RPD	Validation Result (µg/kg)	Validation Qualifier	Reason Code
SSHS-B1215-SUB-4-6	PCB-1248	150	NA	60	150	J	7
PS-FD-6	PCB-1248	280	NA		280	J	7

µg/kg-micrograms per kilogram

NA-not applicable

1.9 Sensitivity

The samples were reported to the MDLs. No elevated non-detect results were reported.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDDs and was not included in the laboratory reports. No other discrepancies were identified between the level II reports and the EDDs.

2.0 METALS

The samples were analyzed for metals by EPA methods 3050B/6010C (Mercury evaluated separately in Section 3.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

2.1 Overall Assessment

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

The serial dilution %D of iron in the serial dilution using sample SSHS-B1254-SUB-12-14 was high and outside the method specified acceptance criteria. Therefore, the iron concentration in sample SSHS-B1254-SUB-12-14 was J qualified as estimated.

Sample	Analyte	Laboratory Result (mg/kg)	Laboratory Flag	Validation Result (mg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1254-SUB-12-14	Iron	39000	NA	39000	J	8

mg/kg-milligrams per kilogram

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

2.2 Holding Times

The holding time for metals analysis of solid samples is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 249493). The metals were not detected in the method blank above the MDLs.

2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair was reported, using sample SSHS-B1254-SUB-12-14. The recovery and RPD results were within the laboratory specified acceptance criteria.

The recoveries of aluminum and iron were flagged with 4, to indicate the sample concentrations were greater than four times the spike concentrations; therefore, the recovery limits were not applicable. Therefore, no qualifications were applied to the aluminum and iron data.

The MSD recoveries of calcium and copper were low and the RPD of calcium was high all outside the laboratory specified acceptance criteria. Therefore, the concentration of calcium was J qualified as estimated and the concentration of copper was J- qualified as estimated with low bias in sample SSHS-B1254-SUB-12-14.

Sample	Analyte	Laboratory Result (mg/kg)	Laboratory Flag	Validation Result (mg/kg)	Validation Qualifier	Reason Code
SSHS-B1254-SUB-12-14	Calcium	23000	F1,F2	Calcium	J	4
SSHS-B1254-SUB-12-14	Copper	120	F1	Copper	J-	4

mg/kg-milligrams per kilogram

F1-laboratory flag indicating the MS and/or MSD Recovery is outside acceptance limits

F2- laboratory flag indicating the MS/MSD RPD exceeds control limits

2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

2.6 Laboratory Duplicate

A laboratory duplicate was not reported with the sample set.

2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

2.8 Field Duplicate

One field duplicate sample was collected with the sample sets and analyzed for metals, PS-MET-DUP-1. Acceptable precision [RPD <50% for results greater than five times the RL] was demonstrated between the field duplicate and the original sample, SSHS-B1252-SUB-10-12.

2.9 Sensitivity

The samples were reported to the MDLs. No elevated non-detect results were reported.

The RLs and MDLs met the RL and MDL criteria in QAPP Table 1.

2.10 Electronic Data Deliverable Review

The results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDDs and was not included in the laboratory reports. No other discrepancies were identified between the level II reports and the EDDs.

3.0 MERCURY

The samples were analyzed for mercury by EPA method 7471B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ⊗ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity

✓ Electronic Data Deliverable Review

3.1 Overall Assessment

The mercury data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

3.2 Holding Times

The holding time for the mercury analysis of solid samples is 28 days from sample collection to analysis. The holding time was met for the sample analyses.

3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 249613).

Mercury was detected in the method blank at an estimated concentration greater than the MDL and less than the reporting limit (RL). Therefore, the estimated mercury concentrations in the associated samples were U qualified as not detected at the RL.

Sample	Analyte	Laboratory Result (mg/kg)	Laboratory Flag	Validation Result (mg/kg)	Validation Qualifier	Reason Code
SSHS-B1251-SUB-10-12	Mercury	0.031	J,B	0.038	U	3
SSHS-B1252-SUB-10-12	Mercury	0.022	J,B	0.040	U	3
PS-MET-DUP-1	Mercury	0.023	J,B	0.039	U	3

mg/kg-milligrams per kilogram

J- result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value

B-laboratory flag indicating the metal was detected in the blank and the sample

3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair was reported, using sample SSHS-B1254-SUB-12-14. The recovery and RPD results were within the laboratory specified acceptance criteria.

3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery result was within the laboratory specified acceptance criteria.

3.6 Laboratory Duplicate

A laboratory duplicate was not reported.

3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

3.8 Field Duplicate

One field duplicate sample was collected with the sample sets and analyzed for mercury, PS-MET-DUP-1. Acceptable precision [RPD <50% for results greater than five times the RL] was demonstrated between the field duplicate and the original sample, SSHS-B1252-SUB-10-12.

3.9 Sensitivity

The samples were reported to the MDL. Elevated non-detect results were not reported.

The RL and MDL met the RL and MDL criteria in QAPP Table 1.

3.10 Electronic Data Deliverable Review

The results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDDs and was not included in the laboratory reports. No other discrepancies were identified between the level II reports and the EDDs.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

ATTACHMENT 3 PCB Qualifications

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier	Reason Code
SSHS-B1230-SUB-2-4	PCB-1248	40000	NA	40000	J	13
SSHS-B1230-SUB-2-4	PCB-1254	16000	NA	16000	J	13
SSHS-B1230-SUB-2-4	PCB-1260	920	NA	920	J	13
SSHS-B1215-SUB-4-6	PCB-1248	150	NA	150	J	13
SSHS-B1215-SUB-4-6	PCB-1254	330	NA	330	J	13
SSHS-B1221-SUB-6-8	PCB-1248	92	NA	92	J	13
SSHS-B1221-SUB-6-8	PCB-1254	410	NA	410	J	13
SSHS-B1077-SUB-2-4	PCB-1248	280	NA	280	J	13
SSHS-B1077-SUB-2-4	PCB-1254	170	NA	170	J	13
SSHS-B1079-SUB-4-6	PCB-1248	4300	NA	4300	J	13
SSHS-B1079-SUB-4-6	PCB-1254	4900	NA	4900	J	13
SSHS-B1079-SUB-4-6	PCB-1260	570	NA	570	J	13
SSHS-B1244-SUB-6-8	PCB-1248	65	NA	65	J	13
SSHS-B1244-SUB-6-8	PCB-1254	30	NA	30	J	13
PS-FD-7	PCB-1248	4200	NA	4200	J	13
PS-FD-7	PCB-1254	3800	NA	3800	J	13
PS-FD-7	PCB-1260	480	NA	480	J	13
PS-FD-6	PCB-1248	280	NA	280	J	13
PS-FD-6	PCB-1254	450	NA	450	J	13
PS-FD-6	PCB-1260	72	NA	72	J	13
SSHS-B1204-SUB-2-4	PCB-1248	1700	NA	1700	J	13
SSHS-B1204-SUB-2-4	PCB-1254	2400	NA	2400	J	13
SSHS-B1204-SUB-2-4	PCB-1260	320	NA	320	J	13
SSHS-B1068-SUB-4-6	PCB-1248	9100	NA	9100	J	13
SSHS-B1068-SUB-4-6	PCB-1254	4900	NA	4900	J	13
SSHS-B1068-SUB-4-6	PCB-1260	670	NA	670	J	13
SSHS-B1236-SUB-4-6	PCB-1248	1600	NA	1600	J	13
SSHS-B1236-SUB-4-6	PCB-1254	900	NA	900	J	13
SSHS-B1236-SUB-4-6	PCB-1260	100	NA	100	J	13
SSHS-B1236-SUB-6-8	PCB-1248	470	NA	470	J	13
SSHS-B1236-SUB-6-8	PCB-1254	260	NA	260	J	13
SSHS-B1236-SUB-6-8	PCB-1260	25	NA	25	J	13
SSHS-B1235-SUB-4-6	PCB-1248	76	NA	76	J	13
SSHS-B1235-SUB-4-6	PCB-1254	44	NA	44	J	13
SSHS-B1235-SUB-4-6	PCB-1260	12	J	12	J	13
SSHS-B1237-SUB-4-6	PCB-1248	680	NA	680	J	13
SSHS-B1237-SUB-4-6	PCB-1254	730	NA	730	J	13

Former Sperry Remington Site-North

28 November 2018

Page 15

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier	Reason Code
SSHS-B1237-SUB-4-6	PCB-1260	290	NA	290	J	13
SSHS-B1075-SUB-2-4	PCB-1248	2600	NA	2600	J	13
SSHS-B1075-SUB-2-4	PCB-1254	1500	NA	1500	J	13
SSHS-B1075-SUB-2-4	PCB-1260	170	NA	170	J	13
SSHS-B1206-SUB-2-4	PCB-1248	310	NA	310	J	13
SSHS-B1206-SUB-2-4	PCB-1254	240	NA	240	J	13
SSHS-B1206-SUB-2-4	PCB-1260	65	p	65	J	13
SSHS-B1206-SUB-4-6	PCB-1248	490	NA	490	J	13
SSHS-B1206-SUB-4-6	PCB-1254	550	NA	550	J	13
SSHS-B1206-SUB-4-6	PCB-1260	86	NA	86	J	13
SSHS-B1233-SUB-4-6	PCB-1248	150	NA	150	J	13
SSHS-B1233-SUB-4-6	PCB-1254	210	NA	210	J	13
SSHS-B1233-SUB-4-6	PCB-1260	33	NA	33	J	13
SSHS-B1203-SUB-2-4	PCB-1248	240000	NA	240000	J	13
SSHS-B1203-SUB-2-4	PCB-1254	120000	NA	120000	J	13
SSHS-B1203-SUB-2-4	PCB-1260	13000	NA	13000	J	13
SSHS-B1219-SUB-4-6	PCB-1248	9500	NA	9500	J	13
SSHS-B1219-SUB-4-6	PCB-1254	6500	NA	6500	J	13
SSHS-B1219-SUB-4-6	PCB-1260	740	NA	740	J	13
SSHS-B1068-SUB-10-12	PCB-1248	2000	NA	2000	J	13
SSHS-B1068-SUB-10-12	PCB-1254	560	NA	560	J	13
SSHS-B1068-SUB-10-12	PCB-1260	93	p	93	J	13
SSHS-B1224-SUB-6-8	PCB-1248	71	NA	71	J	13
SSHS-B1224-SUB-6-8	PCB-1254	22	NA	22	J	13
SSHS-B1224-SUB-8-10	PCB-1248	8900	NA	8900	J	13
SSHS-B1224-SUB-8-10	PCB-1254	5100	NA	5100	J	13
SSHS-B1224-SUB-8-10	PCB-1260	440	NA	440	J	13
SSHS-B1223-SUB-6-8	PCB-1248	680	NA	680	J	13
SSHS-B1223-SUB-6-8	PCB-1254	230	NA	230	J	13
SSHS-B1223-SUB-6-8	PCB-1260	51	NA	51	J	13
SSHS-B1237-SUB-8-10	PCB-1248	2200	NA	2200	J	13
SSHS-B1237-SUB-8-10	PCB-1254	1100	NA	1100	J	13
SSHS-B1237-SUB-8-10	PCB-1260	220	NA	220	J	13
SSHS-B1078-SUB-2-4	PCB-1248	5600	NA	5600	J	13
SSHS-B1078-SUB-2-4	PCB-1254	2300	NA	2300	J	13
SSHS-B1078-SUB-2-4	PCB-1260	430	F1	430	J	13
070318 09:15_7-2-FD-1	PCB-1248	1000	NA	1000	J	13
070318 09:15_7-2-FD-1	PCB-1254	340	NA	340	J	13
070318 09:15_7-2-FD-1	PCB-1260	72	NA	72	J	13
070318 09:15_7-2-FD-2	PCB-1248	250	NA	250	J	13

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier	Reason Code
070318 09:15_7-2-FD-2	PCB-1254	170	NA	170	J	13
070318 09:15_7-2-FD-2	PCB-1260	42	p	42	J	13
SSHS-B1254-SUB-10-12RA	PCB-1248	1200	NA	1200	J	13
SSHS-B1254-SUB-10-12	PCB-1254	430	NA	430	J	13
SSHS-B1254-SUB-10-12	PCB-1260	70	NA	70	J	13
SSHS-B1254-SUB-12-14RA	PCB-1248	310	NA	310	J	13
SSHS-B1254-SUB-12-14	PCB-1254	110	NA	110	J	13
SSHS-B1254-SUB-12-14	PCB-1260	20	NA	20	J	13
SSHS-B1252-SUB-10-12RA	PCB-1248	59	NA	59	J	13
SSHS-B1252-SUB-10-12	PCB-1254	17	J	17	J	13

µg/kg-microgram per kilogram

NA-not applicable

p-laboratory flag indicating the RPDs between the primary and confirmation GC column was >40%; the lower value was reported

J-the result is less than the RL but greater than the MDL and the concentration is an approximate value

Memorandum

Date: 29 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-79550-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of twenty-two solid samples including two samples for matrix spike/matrix spike duplicate analysis and four field duplicate samples collected July 5-6, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-79550-1	SSHS-B1249-SUB-10-12

Laboratory ID	Client ID
180-79550-2	SSHS-B1249-SUB-10-12-DUP

Laboratory ID	Client ID
180-79550-3	SSHS-B1104-SUB-12-14
180-79550-4	SSHS-B1104-SUB-4-6
180-79550-5	SSHS-B1091-SUB-14-16
180-79550-6	SSHS-B1162-SUB-8-10
180-79550-7	SSHS-B1228-SUB-2-4
180-79550-8	SSHS-B1198-SUB-8-10
180-79550-9	SSHS-B1198-SUB-10-12
180-79550-10	SSHS-B1198-SUB-12-14
180-79550-11	SSHS-B1205-SUB-2-4
180-79550-12	SSHS-B1205-SUB-12-14
180-79550-13	SSHS-B1092-SUB-14-16
180-79550-14	SSHS-B1092-SUB-14-16-DUP
180-79550-15	SSHS-B1093-SUB-14-16
180-79550-16	SSHS-B1093-SUB-14-16-DUP
180-79550-17	SSHS-B1094-SUB-14-16

Laboratory ID	Client ID
180-79550-17 MS	SSHS-B1094-SUB-14-16 MS
180-79550-17 MSD	SSHS-B1094-SUB-14-16 MSD
180-79550-18	SSHS-B1081-SUB-6-8
180-79550-19	SSHS-B1122-SUB-10-12
180-79550-20	SSHS-B1076-SUB-4-6
180-79550-20 MS	SSHS-B1076-SUB-4-6 MS
180-79550-20 MSD	SSHS-B1076-SUB-4-6 MSD
180-79550-21	SSHS-B1076-SUB-4-6-DUP
180-79550-22	SSHS-B1158-SUB-8-10
180-79550-23	SSHS-B1193-SUB-4-6
180-79550-24	SSHS-B1086-SUB-10-12
180-79550-25	SSHS-B1247-SUB-10-12
180-79550-26	SSHS-B1203-SUB-4-6

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following was noted with the chain of custody (COC) forms:

- “SUB” was added to the sample IDs per the samples request.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate

- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 **Overall Assessment**

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- Two PCB 1260 peak %Ds were outside the method specified acceptance criteria on gas chromatography (GC) column CLP2 in a CCV in batch 249621 (CCV 180-249621/5). Since PCB 1260 was reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

In addition, one PCB concentration was flagged with p, indicating that the relative percent difference (RPD) between the primary and confirmation GC columns was >40%; the lower value was reported. Therefore, based on professional and technical judgment, the concentration of PCB 1260 in this sample was J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1104-SUB-4-6	PCB-1248	3600	NA	3600	J	13
SSHS-B1104-SUB-4-6	PCB-1254	1700	NA	1700	J	13
SSHS-B1104-SUB-4-6	PCB-1260	480	NA	480	J	13
SSHS-B1162-SUB-8-10	PCB-1248	250	NA	250	J	13
SSHS-B1162-SUB-8-10	PCB-1254	89	NA	89	J	13

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1162-SUB-8-10	PCB-1260	14	J,p	14	J	13
SSHS-B1198-SUB-8-10	PCB-1248	170	NA	170	J	13
SSHS-B1198-SUB-8-10	PCB-1254	400	NA	400	J	13
SSHS-B1198-SUB-10-12	PCB-1248	2200	NA	2200	J	13
SSHS-B1198-SUB-10-12	PCB-1254	910	NA	910	J	13
SSHS-B1198-SUB-12-14	PCB-1248	48	NA	48	J	13
SSHS-B1198-SUB-12-14	PCB-1254	25	NA	25	J	13
SSHS-B1092-SUB-14-16-DUP	PCB-1248	89	NA	89	J	13
SSHS-B1092-SUB-14-16-DUP	PCB-1254	94	NA	94	J	13
SSHS-B1093-SUB-14-16	PCB-1248	96	NA	96	J	13
SSHS-B1093-SUB-14-16	PCB-1254	58	NA	58	J	13
SSHS-B1093-SUB-14-16	PCB-1260	19	J	19	J	13
SSHS-B1093-SUB-14-16-DUP	PCB-1254	49	NA	49	J	13
SSHS-B1093-SUB-14-16-DUP	PCB-1260	26	NA	26	J	13
SSHS-B1193-SUB-4-6	PCB-1248	73	NA	73	J	13
SSHS-B1193-SUB-4-6	PCB-1254	30	NA	30	J	13
SSHS-B1086-SUB-10-12	PCB-1248	480	NA	480	J	13
SSHS-B1086-SUB-10-12	PCB-1254	370	NA	370	J	13
SSHS-B1086-SUB-10-12	PCB-1260	73	NA	73	J	13

µg/kg-microgram per kilogram

J-the result is less than the reporting limit (RL) but greater than the method detection limit (MDL) and the concentration is an approximate value

p-laboratory flag indicating the RPDs between the primary and confirmation GC column was >40%; the lower value was reported

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 249834 and 249835). PCBs were not detected in the method blanks above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two MS/MSD pairs were reported using samples SSHS-B1094-SUB-14-16 and SSHS-B1076-SUB-4-6. The recovery and RPD results were within the laboratory specified acceptance criteria.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported, with the following exception.

The decachlorobiphenyl recovery on GC column CLP2 in sample SSHS-B1198-SUB-10-12 was high and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Field Duplicate

Four field duplicates, SSHS-B1249-SUB-10-12-DUP, SSHS-B1092-SUB-14-16-DUP, SSHS-B1093-SUB-14-16-DUP and SSHS-B1076-SUB-4-6-DUP, were collected with the sample set. Acceptable precision [RPD <50% for results greater than five times the RL] was demonstrated between the field duplicates and the original samples SSHS-B1249-SUB-10-12, SSHS-B1092-SUB-14-16, SSHS-B1093-SUB-14-16 and SSHS-B1076-SUB-4-6, respectively.

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were not reported.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 29 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-79581-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of twelve solid samples collected July 7-9, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-79581-1	SSHS-B1400-SUB-2-4

Laboratory ID	Client ID
180-79581-2	SSHS-B1411-SUB-6-8

Laboratory ID	Client ID
180-79581-3	SSHS-B1412-SUB-8-10
180-79581-4	SSHS-B1413-SUB-8-10
180-79581-5	SSHS-B1415-SUB-8-10
180-79581-6	SSHS-B1417-SUB-10-12
180-79581-7	SSHS-B1418-SUB-10-12

Laboratory ID	Client ID
180-79581-8	SSHS-B1414-SUB-8-10
180-79581-9	SSHS-B1410-SUB-6-8
180-79581-10	SSHS-B1401-SUB-6-8
180-79581-11	SSHS-B1255-SUB-4-6-BOT
180-79581-12	SSHS-B1256-SUB-6-8-BOT

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issue was noted with the chain of custody (COC) forms:

- The samples were received with the metal analyses on hold. Metals were not reported in the report.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid

analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1400-SUB-2-4	PCB-1248	11000	NA	11000	J	13
SSHS-B1400-SUB-2-4	PCB-1254	4800	NA	4800	J	13
SSHS-B1400-SUB-2-4	PCB-1260	480	NA	480	J	13
SSHS-B1411-SUB-6-8	PCB-1248	2200	NA	2200	J	13
SSHS-B1411-SUB-6-8	PCB-1254	1300	NA	1300	J	13
SSHS-B1411-SUB-6-8	PCB-1260	180	NA	180	J	13
SSHS-B1412-SUB-8-10	PCB-1248	280	NA	280	J	13
SSHS-B1412-SUB-8-10	PCB-1254	250	NA	250	J	13
SSHS-B1412-SUB-8-10	PCB-1260	49	NA	49	J	13
SSHS-B1413-SUB-8-10	PCB-1248	2800	NA	2800	J	13
SSHS-B1413-SUB-8-10	PCB-1254	1300	NA	1300	J	13
SSHS-B1413-SUB-8-10	PCB-1260	170	NA	170	J	13
SSHS-B1415-SUB-8-10	PCB-1248	420	NA	420	J	13
SSHS-B1415-SUB-8-10	PCB-1254	340	NA	340	J	13
SSHS-B1415-SUB-8-10	PCB-1260	48	NA	48	J	13
SSHS-B1417-SUB-10-12	PCB-1248	28000	NA	28000	J	13
SSHS-B1417-SUB-10-12	PCB-1254	11000	NA	11000	J	13
SSHS-B1417-SUB-10-12	PCB-1260	1200	NA	1200	J	13
SSHS-B1418-SUB-10-12	PCB-1248	850	NA	850	J	13
SSHS-B1418-SUB-10-12	PCB-1254	390	NA	390	J	13
SSHS-B1418-SUB-10-12	PCB-1260	46	NA	46	J	13
SSHS-B1410-SUB-6-8	PCB-1248	350	NA	350	J	13
SSHS-B1410-SUB-6-8	PCB-1254	180	NA	180	J	13
SSHS-B1410-SUB-6-8	PCB-1260	27	NA	27	J	13
SSHS-B1401-SUB-6-8	PCB-1248	4900	NA	4900	J	13
SSHS-B1401-SUB-6-8	PCB-1254	2000	NA	2000	J	13
SSHS-B1401-SUB-6-8	PCB-1260	260	NA	260	J	13
SSHS-B1255-SUB-4-6-BOT	PCB-1248	4900	NA	4900	J	13
SSHS-B1255-SUB-4-6-BOT	PCB-1254	2400	NA	2400	J	13
SSHS-B1255-SUB-4-6-BOT	PCB-1260	260	NA	260	J	13

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1256-SUB-6-8-BOT	PCB-1248	660	NA	660	J	13
SSHS-B1256-SUB-6-8-BOT	PCB-1254	350	NA	350	J	13
SSHS-B1256-SUB-6-8-BOT	PCB-1260	81	NA	81	J	13

µg/kg-microgram per kilogram

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 **Holding Times**

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 **Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 250103 and 250287). PCBs were not detected in the method blanks above the method detection limits (MDLs).

1.4 **Matrix Spike/Matrix Spike Duplicate (MS/MSD)**

MS/MSD pairs were not reported with the data.

1.5 **Laboratory Control Sample (LCS)**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 **Surrogates**

Acceptable surrogate recoveries were reported.

1.7 **Equipment Blank**

Equipment blanks were not collected with the sample set.

1.8 Field Duplicate

Field duplicates were not collected with the sample set.

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilutions analyzed.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 29 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-79670-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of seventeen solid samples including one sample for matrix spike/matrix spike duplicate (MS/MSD) analysis and two field duplicate samples collected July 10-11, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The remaining qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-79670-1	SSHS-B1257-SUB-6-8-BOT

Laboratory ID	Client ID
180-79670-2	SW-001-0-2

Laboratory ID	Client ID
180-79670-3	SW-002-2-4
180-79670-4	SW-003-2-4
180-79670-5	SW-004-4-6
180-79670-6	SW-005-4-6
180-79670-7	SW-006-4-6
180-79670-8	SW-007-4-6
180-79670-9	SW-008-6-8
180-79670-10	SW-009-6-8
180-79670-11	SW-010-8-10
180-79670-12	SW-011-10-12

Laboratory ID	Client ID
180-79670-12 MS	SW-011-10-12 MS
180-79670-12 MSD	SW-011-10-12 MSD
180-79670-13	SW-012-2-4
180-79670-14	SW-013-2-4
180-79670-15	SW-014-0-2
180-79670-16	SW-015-0-2
180-79670-17	SW-016-2-4
180-79670-18	DUP1
180-79670-19	DUP2

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issue was noted with the chain of custody (COC) forms:

- No collection time was documented on the COC for the field duplicate sample. The laboratory assigned collection time of 00:00.
- Sample SW-009-6-8 was listed as SW-009-2-4 on the container label. The sample was logged in per the COC.
- Incorrect error corrections were observed on the COC, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate

- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 **Overall Assessment**

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- The PCB 1254 %Ds in a CCV in batch 250548 (CCV 180-250548/1) were outside the method specified acceptance criteria on gas chromatography (GC) column CLP2. Since PCB 1254 was reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.
- The PCB 1221 %Ds and one PCB 1254 peak %D were outside the method specified acceptance criteria on GC column CLP2 in a CCV in batch 250548 (CCV 180-250548/47). Since PCB 1221 and PCB 1254 were reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

In addition, one PCB concentration was flagged with p, indicating that the relative percent difference (RPD) between the primary and confirmation GC columns was >40%; the lower value was reported. Therefore, based on professional and technical judgment, the concentration of PCB 1260 in this sample was J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1257-SUB-6-8-BOT	PCB-1248	45000	NA	45000	J	13
SSHS-B1257-SUB-6-8-BOT	PCB-1254	17000	NA	17000	J	13
SSHS-B1257-SUB-6-8-BOT	PCB-1260	1300	NA	1300	J	13
SW-001-0-2	PCB-1248	120	NA	120	J	13
SW-001-0-2	PCB-1254	63	NA	63	J	13
SW-002-2-4	PCB-1248	1900	NA	1900	J	13
SW-002-2-4	PCB-1254	1100	NA	1100	J	13
SW-002-2-4	PCB-1260	210	NA	210	J	13
SW-003-2-4	PCB-1248	430	NA	430	J	13
SW-003-2-4	PCB-1254	280	NA	280	J	13
SW-003-2-4	PCB-1260	45	NA	45	J	13
SW-004-4-6	PCB-1248	110	NA	110	J	13
SW-004-4-6	PCB-1254	89	NA	89	J	13
SW-005-4-6	PCB-1248	320	NA	320	J	13
SW-005-4-6	PCB-1254	450	NA	450	J	13
SW-005-4-6	PCB-1260	55	NA	55	J	13
SW-006-4-6	PCB-1248	20000	NA	20000	J	13
SW-006-4-6	PCB-1254	7300	NA	7300	J	13
SW-006-4-6	PCB-1260	620	NA	620	J	13
SW-007-4-6	PCB-1248	4500	NA	4500	J	13
SW-007-4-6	PCB-1254	1700	NA	1700	J	13
SW-007-4-6	PCB-1260	170	NA	170	J	13
SW-008-6-8	PCB-1248	2200	NA	2200	J	13
SW-008-6-8	PCB-1254	3700	NA	3700	J	13
SW-008-6-8	PCB-1260	390	p	390	J	13
SW-009-6-8	PCB-1248	12000	NA	12000	J	13
SW-009-6-8	PCB-1254	4600	NA	4600	J	13
SW-009-6-8	PCB-1260	370	NA	370	J	13
SW-010-8-10	PCB-1248	150	NA	150	J	13
SW-010-8-10	PCB-1254	86	NA	86	J	13
SW-011-10-12	PCB-1248	28000	NA	28000	J	13
SW-011-10-12	PCB-1254	11000	NA	11000	J	13
SW-011-10-12	PCB-1260	1000	F2	1000	J	13
SW-012-2-4	PCB-1248	1300	NA	1300	J	13

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SW-012-2-4	PCB-1254	580	NA	580	J	13
SW-012-2-4	PCB-1260	63	NA	63	J	13
SW-013-2-4	PCB-1248	2500	NA	2500	J	13
SW-013-2-4	PCB-1254	1600	NA	1600	J	13
SW-013-2-4	PCB-1260	280	NA	280	J	13
SW-015-0-2	PCB-1248	34	NA	34	J	13
SW-015-0-2	PCB-1254	20	NA	20	J	13
SW-016-2-4	PCB-1248	4400	NA	4400	J	13
SW-016-2-4	PCB-1254	2400	NA	2400	J	13
SW-016-2-4	PCB-1260	410	NA	410	J	13
DUP1	PCB-1248	500	NA	500	J	13
DUP1	PCB-1254	400	NA	400	J	13
DUP1	PCB-1260	44	NA	44	J	13
DUP2	PCB-1248	1500	NA	1500	J	13
DUP2	PCB-1254	660	NA	660	J	13
DUP2	PCB-1260	55	NA	55	J	13

µg/kg-microgram per kilogram

J-the result is less than the reporting limit (RL) but greater than the method detection limit (MDL) and the concentration is an approximate value

F2- laboratory flag indicating the MS/MSD RPD exceeds control limits

p-laboratory flag indicating the RPDs between the primary and confirmation GC column was >40%; the lower value was reported

NA-not applicable

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 250287). PCBs were not detected in the method blank above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One MS/MSD pair was reported using sample SW-011-10-12. The recovery and RPD results were within the laboratory specified acceptance criteria, with the following exceptions.

The MS/MSD recoveries of PCB 1016 and RPDs of PCB 1016 and PCB 1260 were high and outside the laboratory specified acceptance criteria. However, based on the contribution from PCB 1248, PCB 1254 and PCB 1260 from the sample and professional and technical judgment, no qualifications were applied to the data.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Field Duplicate

Two field duplicates, DUP1 and DUP2, were collected with the sample set. Acceptable precision [RPD <50% for results greater than five times the RL] was demonstrated between the field duplicates and the original samples SW-004-4-6 and SW-007-4-6, respectively, with the following exceptions.

Results with two concentrations greater than five times the RL and with an RPD greater than 50% were J qualified as estimated. See a summary of qualifications in the table below.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	RPD	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SW-004-4-6	PCB-1248	110	NA	128	110	J	7
DUP1	PCB-1248	500	NA		500	J	7

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	RPD	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SW-004-4-6	PCB-1254	89	NA	127	89	J	7
DUP1	PCB-1254	400	NA		400	J	7
SW-007-4-6	PCB-1248	4500	NA	100	4500	J	7
DUP2	PCB-1248	1500	NA		1500	J	7
SW-007-4-6	PCB-1254	1700	NA	88	1700	J	7
DUP2	PCB-1254	660	NA		660	J	7
SW-007-4-6	PCB-1260	170	NA	102	170	J	7
DUP2	PCB-1260	55	NA		55	J	7

µg/kg-microgram per kilogram

NA-not applicable

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilutions analyzed.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample

Former Sperry Remington Site-North

29 November 2018

Page 8

receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 29 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverables, TestAmerica
Job ID 180-79745-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of thirteen solid samples collected July 26, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Semivolatile Organic Compounds (SVOCs) by EPA Methods 3541/8270D
- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Metals by EPA Methods 3050B/6010C
- Mercury by EPA Method 7471B
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives, with the following exception. Due to MS/MSD recoveries less than 10%, the nondetect result of 2,4-dinitrophenol in sample SSHS-P2 was R qualified as rejected. The remaining qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review, January

2017 (EPA 540-R-2017-001), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-79745-1	SSHS-P2
180-79745-2	P1-10-12
180-79745-3	NBSW-10-12
180-79745-4	EBSW-10-12
180-79745-5	SW-017-0-2
180-79745-6	SW-018-4-6
180-79745-7	SW-019-6-8

Laboratory ID	Client ID
180-79745-8	SW-020-6-8
180-79745-9	SW-021-4-6
180-79745-10	SSHS-B1409-6-8
180-79745-11	SSHS-B1408-6-8
180-79745-12	SSHS-CS1
180-79745-13	SSHS-CS2

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issue was noted with the chain of custody (COC) forms:

- Incorrect error corrections were observed on the COC, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 SEMIVOLATILE ORGANIC COMPOUNDS

The samples were analyzed for SVOCs by EPA methods 3541/8270D.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate

- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The SVOC data reported in this package are considered usable for meeting project objective, with the following exceptions. Due to MS/MSD recoveries less than 10%, the nondetect result of 2,4-dinitrophenol in sample SSHS-P2 was R qualified as rejected.

Therefore, the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 99.8%.

1.2 Holding Times

The holding times for SVOC analysis of solid samples are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 250696). SVOCs were not detected in the method blank above the method detection limits (MDLs).

1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair was reported, using sample SSHS-P2. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria, with the following exceptions.

2,4-Dinitrophenol was not recovered (0% recovery) in the MS/MSD pair. The MS/MSD recoveries of caprolactam, 4-chloroaniline, pentachlorophenol and 2,3,4,6-tetrachlorophenol were low and the RPD of pentachlorophenol was high, all outside the laboratory specified acceptance criteria. Therefore, the nondetect 2,4-dinitrophenol result was R qualified as rejected and the nondetect caprolactam, 4-chloroaniline, pentachlorophenol and 2,3,4,6-tetrachlorophenol results were UJ qualified as estimated less than the MDLs in sample SSHS-P2.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-P2	2,3,4,6-Tetrachlorophenol	440	U,F1	440	UJ	4
SSHS-P2	2,4-Dinitrophenol	2800	U,F1	2800	R	4
SSHS-P2	4-Chloroaniline	35	U,F1	35	UJ	4
SSHS-P2	Caprolactam	690	U,F1	690	UJ	4
SSHS-P2	Pentachlorophenol	1700	U,F1,F2	1700	UJ	4

µg/kg-milligrams per kilogram

U- not detected at the MDL

F1-laboratory flag indicating the MS and/or MSD recovery is outside acceptance limits

F2-laboratory flag indicating the MS/MSD RPD is outside acceptance limits

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.5 **Laboratory Control Sample (LCS)**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 **Surrogates**

Acceptable surrogate recoveries were reported.

1.7 **Equipment Blank**

Equipment blanks were not collected with the sample set.

1.8 **Field Duplicate**

Field duplicates were not collected with the sample set.

1.9 **Sensitivity**

The samples were reported to the MDLs. Elevated nondetect results were reported due to the dilutions analyzed.

The reporting limits (RLs) and MDLs met the RL and MDL criteria in QAPP Table 1.

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

2.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

2.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Former Sperry Remington Site-North

29 November 2018

Page 6

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier	Reason Code
SSHS-P2	PCB-1248	72000	NA	72000	J	13
SSHS-P2	PCB-1254	32000	NA	32000	J	13
SSHS-P2	PCB-1260	2300	NA	2300	J	13
P1-10-12	PCB-1248	120000	NA	120000	J	13
P1-10-12	PCB-1254	44000	NA	44000	J	13
P1-10-12	PCB-1260	3400	NA	3400	J	13
NBSW-10-12	PCB-1248	370	NA	370	J	13
NBSW-10-12	PCB-1254	170	NA	170	J	13
NBSW-10-12	PCB-1260	19	NA	19	J	13
EBSW-10-12	PCB-1248	12000	NA	12000	J	13
EBSW-10-12	PCB-1254	5300	NA	5300	J	13
EBSW-10-12	PCB-1260	570	NA	570	J	13
SW-018-4-6	PCB-1248	37000	NA	37000	J	13
SW-018-4-6	PCB-1254	16000	NA	16000	J	13
SW-018-4-6	PCB-1260	1500	NA	1500	J	13
SW-019-6-8	PCB-1248	34000	NA	34000	J	13
SW-019-6-8	PCB-1254	13000	NA	13000	J	13
SW-019-6-8	PCB-1260	1100	NA	1100	J	13
SW-020-6-8	PCB-1248	5500	NA	5500	J	13
SW-020-6-8	PCB-1254	2700	NA	2700	J	13
SW-020-6-8	PCB-1260	250	NA	250	J	13
SW-021-4-6	PCB-1248	7800	NA	7800	J	13
SW-021-4-6	PCB-1254	3700	NA	3700	J	13
SW-021-4-6	PCB-1260	350	J	350	J	13
SSHS-B1409-6-8	PCB-1248	760	NA	760	J	13
SSHS-B1409-6-8	PCB-1254	510	NA	510	J	13
SSHS-B1409-6-8	PCB-1260	88	NA	88	J	13
SSHS-B1408-6-8	PCB-1248	18000	NA	18000	J	13
SSHS-B1408-6-8	PCB-1254	10000	NA	10000	J	13
SSHS-B1408-6-8	PCB-1260	1200	NA	1200	J	13
SSHS-CS1	PCB-1248	16000	NA	16000	J	13
SSHS-CS1	PCB-1254	6800	NA	6800	J	13
SSHS-CS1	PCB-1260	780	NA	780	J	13
SSHS-CS2	PCB-1248	1600	NA	1600	J	13
SSHS-CS2	PCB-1254	1100	NA	1100	J	13
SSHS-CS2	PCB-1260	130	NA	130	J	13

µg/kg-microgram per kilogram

NA-not applicable

J-the result is less than the RL but greater than the MDL and the concentration is an approximate value

2.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 250578). PCBs were not detected in the method blank above the MDLs.

2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data.

2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

2.6 Surrogates

Acceptable surrogate recoveries were reported.

2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

2.8 Field Duplicate

Field duplicates were not collected with the sample set.

2.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were reported due to the dilutions analyzed.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

2.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

3.0 METALS

The samples were analyzed for metals by EPA methods 3050B/6010C (Mercury evaluated separately in Section 4.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity

✓ Electronic Data Deliverable Review

3.1 Overall Assessment

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

3.2 Holding Times

The holding time for metals analysis of solid samples is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 250685). The metals were not detected in the method blank above the MDLs.

3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data.

3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

3.6 Laboratory Duplicate

A laboratory duplicate was not reported with the sample set.

3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

3.8 Field Duplicate

Field duplicates were not collected with the sample set.

3.9 Sensitivity

The samples were reported to the MDLs. No elevated non-detect results were reported.

The RLs and MDLs met the RL and MDL criteria in QAPP Table 1.

3.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

4.0 MERCURY

The samples were analyzed for mercury by EPA method 7471B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

4.1 Overall Assessment

The mercury data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

4.2 Holding Times

The holding time for the mercury analysis of solid samples is 28 days from sample collection to analysis. The holding time was met for the sample analyses.

4.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 250659). Mercury was not detected in the method blank above the MDL.

4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data.

4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery result was within the laboratory specified acceptance criteria.

4.6 Laboratory Duplicate

A laboratory duplicate was not reported.

4.7 Equipment Blank

Equipment blanks were not collected with the sample set.

4.8 Field Duplicate

Field duplicates were not collected with the sample set.

4.9 Sensitivity

The samples were reported to the MDL. No elevated non-detect results were reported.

The RL and MDL met the RL and MDL criteria in QAPP Table 1.

4.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 20 December 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-80110-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of six solid samples including one sample for matrix spike/matrix spike duplicate analysis and one field duplicate sample collected July 24, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-80110-1	SSHS-B1325-SUB-2-4

Laboratory ID	Client ID
180-80110-1 MS	SSHS-B1325-SUB-2-4 MS

Laboratory ID	Client ID
180-80110-1 MSD	SSHS-B1325-SUB-2-4 MSD
180-80110-2	SSHS-B1373-SUB-8-10
180-80110-3	ELECTRIC 1
180-80110-4	ELECTRIC 2

Laboratory ID	Client ID
180-80110-5	NAT GAS 1
180-80110-6	NAT GAS 2
180-80110-7	DUPLICATE

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issue was noted with the chain of custody (COC) form:

- No collection time was documented on the COC for the field duplicate sample. The laboratory assigned collection time of 00:00.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid

analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- Two PCB 1248 peak %Ds were outside the method specified acceptance criteria on gas chromatography (GC) column CLP1 in a CCV in batch 251723 (CCV 180-251723/4). Since PCB 1248 was reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.
- The PCB 1016 %Ds on GC column CLP1 and two PCB 1016 peak %Ds on GC column CLP2 in a CCV in batch 251723 (CCV 180-251723/5) were outside the method specified acceptance criteria on GC column CLP2 with high biases. Since the bias was high and PCB 1016 was not detected in the associated samples, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1325-SUB-2-4	PCB-1248	650	NA	650	J	13
SSHS-B1325-SUB-2-4	PCB-1254	310	NA	310	J	13
SSHS-B1325-SUB-2-4	PCB-1260	90	NA	90	J	13
ELECTRIC 1	PCB-1248	620	NA	620	J	13
ELECTRIC 1	PCB-1254	360	NA	360	J	13
ELECTRIC 1	PCB-1260	120	NA	120	J	13
ELECTRIC 2	PCB-1248	2600	NA	2600	J	13
ELECTRIC 2	PCB-1254	1000	NA	1000	J	13
ELECTRIC 2	PCB-1260	330	NA	330	J	13
NAT GAS 1	PCB-1248	230	NA	230	J	13
NAT GAS 1	PCB-1254	170	NA	170	J	13
NAT GAS 1	PCB-1260	51	NA	51	J	13
NAT GAS 2	PCB-1248	760	NA	760	J	13
NAT GAS 2	PCB-1254	320	NA	320	J	13
NAT GAS 2	PCB-1260	100	NA	100	J	13
DUPLICATE	PCB-1248	670	NA	670	J	13

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
DUPLICATE	PCB-1254	440	NA	440	J	13
DUPLICATE	PCB-1260	150	NA	150	J	13

µg/kg-microgram per kilogram

NA-not applicable

1.2 **Holding Times**

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 **Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 251642). PCBs were not detected in the method blank above the MDLs.

1.4 **Matrix Spike/Matrix Spike Duplicate**

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One MS/MSD pair was reported using sample SSHS-B1325-SUB-2-4. The recovery and RPD results were within the laboratory specified acceptance criteria.

1.5 **Laboratory Control Sample**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 **Surrogates**

Acceptable surrogate recoveries were reported, with the following exceptions.

The tetrachloro-m-xylene recoveries on GC column CLP in the MS and MSD using sample SSHS-B1325-SUB-2-4 and samples NAT GAS 1 and DUPLICATE were high and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

The decachlorobiphenyl and tetrachloro-m-xylene recoveries on GC column CLP2 in sample NAT GAS 2 were high and outside the laboratory specified acceptance criteria. Since the PCB concentration in sample NAT GAS 2 were J qualified based on the presence of multiple PCBs, no additional qualifications were applied to the data, based on professional and technical judgment.

1.7 **Equipment Blank**

Equipment blanks were not collected with the sample set.

1.8 **Field Duplicate**

One field duplicate, DUPLICATE, was collected with the sample set. However, the original sample could not be determined; therefore, a field duplicate assessment was not performed.

1.9 **Sensitivity**

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilutions analyzed.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 **Electronic Data Deliverable (EDD) Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample

receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 20 December 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverables, TestAmerica
Job IDs 180-80225-1, 180-80225-2, 180-80225-3**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of two solid samples, a field duplicate sample and one trip blank, collected July 26, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Volatile Organic Compounds (VOCs) by EPA Methods 5030C/8260C and 5035/8260C
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-80249-1	G-3-4-41330

Laboratory ID	Client ID
180-80249-2	HYD1

Laboratory ID	Client ID
180-80249-3	DUP-07262018-1

Laboratory ID	Client ID
180-80249-4	TRIP BLANK

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issues were noted with the chain of custody (COC) forms:

- No collection times were documented on the COC for the field duplicate sample and trip blank. The laboratory assigned collection times of 00:00.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 VOLATILE ORGANIC COMPOUNDS

The samples were analyzed for VOCs by EPA methods 5030C/8260C and 5035/8260C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Trip Blank
- ✓ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The VOC data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for these analyses, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) in the continuing calibration verification (CCV) standards:

- Acetone in the CCV in batch 252049 had a %D that was high and outside the method specified acceptance criteria, with high bias. Since the %D was within the validation guidance acceptance criteria and based on professional and technical judgment, no qualifications were applied to the data.
- 1,1,2,2-tetrachloroethane, 1,2-dibromo-3-chloropropane, 4-methyl-2-pentanone, bromoform and chloroethane in the CCV in batch 252080 had %Ds that were high and outside the method specified acceptance criteria, with low biases. Since the %Ds of 1,1,2,2-tetrachloroethane, 4-methyl-2-pentanone and chloroethane were within the validation guidance acceptance criteria and based on professional and technical judgment, no qualifications were applied to the these compounds. However, the nondetect 1,2-dibromo-3-chloropropane and bromoform results in the associated samples were UJ qualified as estimated less than the method detection limits (MDLs).
- 2-Butanone and 4-methyl-2-pentanone in the CCV in batch 252569 had %Ds that were high and outside the method specified acceptance criteria, with low biases. Since the %Ds were within the validation guidance acceptance criteria and based on professional and technical judgment, no qualifications were applied to the data.
- Trichlorofluoromethane in the CCV in batch 252569 had a %D that was high and outside the method specified acceptance criteria, with high bias. Since the %D was within the validation guidance acceptance criteria and based on professional and technical judgment, no qualifications were applied to the data.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
HYD1	1,2-Dibromo-3-Chloropropane	3.9	U	3.9	UJ	9
HYD1	Bromoform	3.3	U	3.3	UJ	9
DUP-07262018-1	1,2-Dibromo-3-Chloropropane	3.6	U	3.6	UJ	9
DUP-07262018-1	Bromoform	3.0	U	3.0	UJ	9

µg/kg-microgram per kilogram

U-not detected at or above the MDL

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the VOC analysis of a preserved solid sample collected as a terracore are 48 hours until laboratory receipt and 14 days from sample collection to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Three method blanks were reported (batches 252049, 252080 and 252569). VOCs were not detected in the method blanks above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs and one LCS/LCS duplicate (LCSD) pair were reported. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Trip Blank

One trip blank accompanied the samples, TRIP BLANK. VOCs were not detected in the trip blank above the MDLs, with the following exception.

Methylene chloride was detected in the trip blank at an estimated concentration greater than the MDL and less than the reporting limit (RL). Since methylene chloride was not detected in the associated samples, no qualifications were applied to the data.

1.9 Field Duplicate

One field duplicate sample was collected with the sample set, DUP-07262018-1. Since the original sample, E-N-1-1, was not analyzed for VOCs, a field duplicate assessment was not performed.

1.10 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were not reported.

The RLs and MDLs met the RL and MDL criteria in QAPP Table 1, with the following exceptions.

1.11 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 20 December 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-80273-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of seventeen solid samples including one sample for matrix spike/matrix spike duplicate (MS/MSD) analysis and two field duplicate samples collected July 27-28, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following test:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-80273-1	SSHS-B1065-SUB-0-2

Laboratory ID	Client ID
180-80273-2	SSHS-B1188-SUB-0-2

Laboratory ID	Client ID
180-80273-3	SSHS-B1066-SUB-0-2
180-80273-4	SSHS-B1245-SUB-4-6
180-80273-5	SSHS-B1245-SUB-6-8
180-80273-6	SSHS-B1082-SUB-6-8
180-80273-7	SSHS-B1082-SUB-8-10
180-80273-8	SSHS-B1239-SUB-4-6
180-80273-9	SSHS-B1239-SUB-6-8
180-80273-10	SSHS-B1193-SUB-2-4
180-80273-11	SSHS-B1253-SUB-6-8
180-80273-12	SSHS-B1395-SUB-0-2
180-80273-13	SSHS-B1204-SUB-10-12

Laboratory ID	Client ID
180-80273-13	SSHS-B1204-SUB-10-12 MS
180-80273-13	SSHS-B1204-SUB-10-12 MSD
180-80273-14	SSHS-B1252-SUB-6-8
180-80273-15	SSHS-B1238-SUB-4-6
180-80273-16	SSHS-B1238-SUB-8-10
180-80273-17	DUP-1
180-80273-18	DUP-2
180-80273-19	SSHS-B1218-SUB-4-6

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issue was noted with the chain of custody (COC) form:

- Incorrect error corrections were observed on the COC, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.
- No collection time was documented on the COC for the field duplicate samples. The laboratory assigned collection time of 00:00.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates

- ✓ Equipment Blank
- ✓ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 **Overall Assessment**

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- Two PCB 1248 peak %Ds were outside the method specified acceptance criteria on gas chromatography (GC) column CLP1 in a CCV in batch 252374 (CCV 180-252374/4). Since PCB 1248 was reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.
- One PCB 1260 peak %D was outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 252374 (CCV 180-252374/5). Since PCB 1260 was reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

In addition, three PCB concentrations were flagged with p, indicating that the relative percent difference (RPD) between the primary and confirmation GC columns was >40%; the lower value was reported. Therefore, based on professional and technical judgment, the concentrations of PCB 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1065-SUB-0-2	PCB-1248	32	NA	32	J	13

Former Sperry Remington Site-North

10 December 2018

Page 4

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1065-SUB-0-2	PCB-1254	24	NA	24	J	13
SSHS-B1065-SUB-0-2	PCB-1260	10	J	10	J	13
SSHS-B1188-SUB-0-2	PCB-1248	54	NA	54	J	13
SSHS-B1188-SUB-0-2	PCB-1254	45	NA	45	J	13
SSHS-B1188-SUB-0-2	PCB-1260	14	J	14	J	13
SSHS-B1066-SUB-0-2	PCB-1248	2300	NA	2300	J	13
SSHS-B1066-SUB-0-2	PCB-1254	900	NA	900	J	13
SSHS-B1066-SUB-0-2	PCB-1260	150	NA	150	J	13
SSHS-B1245-SUB-4-6	PCB-1248	16000	NA	16000	J	13
SSHS-B1245-SUB-4-6	PCB-1254	4200	NA	4200	J	13
SSHS-B1245-SUB-4-6	PCB-1260	700	p	700	J	13
SSHS-B1245-SUB-6-8	PCB-1248	15000	NA	15000	J	13
SSHS-B1245-SUB-6-8	PCB-1254	3700	NA	3700	J	13
SSHS-B1245-SUB-6-8	PCB-1260	610	NA	610	J	13
SSHS-B1082-SUB-6-8	PCB-1248	88000	NA	88000	J	13
SSHS-B1082-SUB-6-8	PCB-1254	24000	NA	24000	J	13
SSHS-B1082-SUB-6-8	PCB-1260	4100	NA	4100	J	13
SSHS-B1082-SUB-8-10	PCB-1248	24000	NA	24000	J	13
SSHS-B1082-SUB-8-10	PCB-1254	6800	NA	6800	J	13
SSHS-B1082-SUB-8-10	PCB-1260	1300	NA	1300	J	13
SSHS-B1239-SUB-4-6	PCB-1248	49000	NA	49000	J	13
SSHS-B1239-SUB-4-6	PCB-1254	13000	NA	13000	J	13
SSHS-B1239-SUB-4-6	PCB-1260	2300	NA	2300	J	13
SSHS-B1239-SUB-6-8	PCB-1248	21000	NA	21000	J	13
SSHS-B1239-SUB-6-8	PCB-1254	4500	NA	4500	J	13
SSHS-B1239-SUB-6-8	PCB-1260	1000	NA	1000	J	13
SSHS-B1193-SUB-2-4	PCB-1248	140	NA	140	J	13
SSHS-B1193-SUB-2-4	PCB-1254	41	NA	41	J	13
SSHS-B1193-SUB-2-4	PCB-1260	7.4	J,p	7.4	J	13
SSHS-B1253-SUB-6-8	PCB-1248	11000	NA	11000	J	13
SSHS-B1253-SUB-6-8	PCB-1254	3200	NA	3200	J	13
SSHS-B1253-SUB-6-8	PCB-1260	600	NA	600	J	13
SSHS-B1395-SUB-0-2	PCB-1248	220	NA	220	J	13
SSHS-B1395-SUB-0-2	PCB-1254	41	NA	41	J	13
SSHS-B1204-SUB-10-12	PCB-1248	1500	NA	1500	J	13
SSHS-B1204-SUB-10-12	PCB-1254	620	NA	620	J	13
SSHS-B1204-SUB-10-12	PCB-1260	130	p	130	J	13
SSHS-B1252-SUB-6-8	PCB-1248	32000	NA	32000	J	13
SSHS-B1252-SUB-6-8	PCB-1254	9300	NA	9300	J	13
SSHS-B1252-SUB-6-8	PCB-1260	1600	NA	1600	J	13

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1238-SUB-4-6	PCB-1248	2200	NA	2200	J	13
SSHS-B1238-SUB-4-6	PCB-1254	770	NA	770	J	13
SSHS-B1238-SUB-4-6	PCB-1260	150	NA	150	J	13
SSHS-B1238-SUB-8-10	PCB-1248	92	NA	92	J	13
SSHS-B1238-SUB-8-10	PCB-1254	33	NA	33	J	13
DUP-1	PCB-1248	2100	NA	2100	J	13
DUP-1	PCB-1254	840	NA	840	J	13
DUP-1	PCB-1260	200	NA	200	J	13
DUP-2	PCB-1248	15000	NA	15000	J	13
DUP-2	PCB-1254	4100	NA	4100	J	13
DUP-2	PCB-1260	770	NA	770	J	13
SSHS-B1218-SUB-4-6	PCB-1248	45000	NA	45000	J	13
SSHS-B1218-SUB-4-6	PCB-1254	13000	NA	13000	J	13
SSHS-B1218-SUB-4-6	PCB-1260	2400	NA	2400	J	13

µg/kg-microgram per kilogram

NA-not applicable

p-laboratory flag indicating the RPDs between the primary and confirmation GC column was >40%; the lower value was reported

J-the result is less than the reporting limit (RL) but greater than the method detection limit (MDL) and the concentration is an approximate value

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 252291). PCBs were not detected in the method blank above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One MS/MSD pair was reported using sample SSHS-B1204-SUB-10-12. The recovery and RPD results were within the laboratory specified acceptance criteria, with the following exceptions.

The MS recovery of PCB-1016 was high and outside the laboratory specified acceptance criteria. However, based on the contribution from PCB 1248 from the sample and professional and technical judgment, no qualifications were applied to the data.

1.5 **Laboratory Control Sample (LCS)**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 **Surrogates**

Acceptable surrogate recoveries were reported, with the following exceptions.

The surrogates were not detected (0% recovery) in samples SSHS-B1082-SUB-6-8 and SSHS-B1239-SUB-4-6. No qualifications were applied to the data, based on the level the samples and surrogates were diluted and professional and technical judgment.

1.7 **Equipment Blank**

Equipment blanks were not collected with the sample set.

1.8 **Field Duplicate**

Two field duplicates, DUP-1 and DUP-2, were collected with the sample set. However, the original samples could not be determined; therefore, field duplicate assessments were not performed.

1.9 **Sensitivity**

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilutions analyzed.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1, for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram
NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 29 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-80274-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of thirty-six solid samples, including two samples for matrix spike/matrix spike duplicate (MS/MSD) analyses and two field duplicate samples, collected July 26, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Metals by EPA Methods 3050B/6010C
- Mercury by EPA Method 7471B
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review, January 2017 (EPA 540-R-2017-001), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-80274-1	G-S-2-1
180-80274-1 MS	G-S-2-1 MS
180-80274-1 MSD	G-S-2-1 MSD
180-80274-2	G-S-2-2
180-80274-3	G-S-2-3
180-80274-4	G-S-3-1
180-80274-5	G-S-3-2
180-80274-5 MS	G-S-3-2 MS
180-80274-5 MSD	G-S-3-2 MSD
180-80274-6	G-S-3-3
180-80274-7	G-S-4-1
180-80274-8	G-S-4-2
180-80274-9	G-S-4-3
180-80274-10	E-N-1-1
180-80274-11	E-N-2-1
180-80274-12	E-S-5-2
180-80274-13	E-S-4-2
180-80274-14	E-S-3-2
180-80274-15	S-N-4-2

Laboratory ID	Client ID
180-80274-16	S-N-5-1
180-80274-17	S-N-3-1
180-80274-18	B-E-1
180-80274-19	B-E-2
180-80274-20	B-E-3
180-80274-22	B-E-5
180-80274-23	E-N-2-3
180-80274-24	E-N-3-1
180-80274-25	E-N-3-2
180-80274-26	E-N-3-3
180-80274-27	E-N-3-4
180-80274-28	E-N-4-1
180-80274-29	E-N-4-2
180-80274-30	E-N-4-3
180-80274-31	E-N-5-1
180-80274-32	B-S-4
180-80274-34	DUP-1
180-80274-35	DUP-2
180-80274-36	G-S-3-4

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issues were noted with the chain of custody (COC) form:

- Incorrect error corrections were observed on the COC, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.
- No collection times were documented on the COC for the field duplicate samples. The laboratory assigned collection times of 00:00.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 **Overall Assessment**

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- One PCB 1260 peak %D and the surrogate decachlorobiphenyl %D were outside the method specified acceptance criteria on gas chromatography (GC) column CLP2 in a CCV in batch 249621 (CCV 180-249621/5). Since PCB 1260 and surrogate decachlorobiphenyl were reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.
- The PCB 1248 %Ds in a CCV in batch 250038 (CCV 180-250038/4) were outside the method specified acceptance criteria on both GC columns. Since the samples with PCB 1248 concentrations were reanalyzed and reported from batch 250307 with a passing %D, no qualifications were applied to the data.
- One PCB 1260 peak had a %D that was outside the method specified acceptance criteria on GC column CLP-1 in a CCV in batch 250038 (CCV 180-250038/5). Since the PCB

1260 concentrations in the associated samples were reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

These qualifications are summarized in Attachment 3.

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Three method blanks were reported (batches 252912, 253064 and 253190). PCBs were not detected in the method blanks above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate

Two sample set specific MS/MSD pairs were reported, using samples G-S-2-1 and G-S-3-2. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria, with the following exceptions.

The MS/MSD recoveries and RPD of PCB 1016 were high and outside the laboratory specified acceptance criteria in the MS/MSD pair using sample G-S-2-1. However, based on the contribution from PCB 1248 from the sample and professional and technical judgment, no qualifications were applied to the data.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Three LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported, with the following exceptions.

The tetrachloro-m-xylene recoveries on GC column CLP in the MS using sample G-S-3-2 and sample E-N-3-2 were high and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

The decachlorobiphenyl and tetrachloro-m-xylene recoveries on GC column CLP2 in sample E-N-4-2 were high and outside the laboratory specified acceptance criteria. Since the PCB concentration in sample E-N-4-2 were J qualified based on the presence of multiple PCBs, no additional qualifications were applied to the data, based on professional and technical judgment.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Field Duplicate

Two field duplicates, DUP-1 and DUP-2, were collected with the sample set. However, the original samples could not be determined; therefore, field duplicate assessments were not performed.

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilution analyzed.

The following RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

2.0 METALS

The samples were analyzed for metals by EPA methods 3050B/6010C (Mercury evaluated separately in Section 3.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

2.1 Overall Assessment

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

2.2 Holding Times

The holding time for metals analysis of solid samples is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 252457). The metals were not detected in the method blank above the MDLs.

2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

2.6 Laboratory Duplicate

A laboratory duplicate was not reported with the sample set.

2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

2.8 Field Duplicate

Two field duplicates, DUP-1 and DUP-2, were collected with the sample set. However, the original samples could not be determined; therefore, field duplicate assessments were not performed.

2.9 Sensitivity

The samples were reported to the MDLs. No elevated non-detect results were reported.

The RLs and MDLs met the RL and MDL criteria in QAPP Table 1.

2.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

3.0 MERCURY

The samples were analyzed for mercury by EPA method 7471B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

3.1 Overall Assessment

The mercury data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

3.2 Holding Times

The holding time for the mercury analysis of solid samples is 28 days from sample collection to analysis. The holding time was met for the sample analyses.

3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 254072). Mercury was not detected in the method blank above the MDL.

3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair was reported, using sample E-N-3-4. The recovery and RPD results were within the laboratory specified acceptance criteria, with the following exceptions.

The MS/MSD recoveries were high and outside the laboratory specified acceptance criteria. Therefore, the estimated mercury concentration in sample E-N-3-4 was J+ qualified as estimated with a high bias.

Sample	Analyte	Laboratory Result (mg/kg)	Laboratory Flag	Validation Result (mg/kg)	Validation Qualifier	Reason Code
E-N-3-4	Mercury	0.020	J,F1	0.020	J+	4

mg/kg-milligrams per kilogram

F1-laboratory flag indicating the MS and/or MSD Recovery is outside acceptance limits

3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery result was within the laboratory specified acceptance criteria.

3.6 Laboratory Duplicate

A laboratory duplicate was not reported.

3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

3.8 Field Duplicate

Two field duplicates, DUP-1 and DUP-2, were collected with the sample set. However, the original samples could not be determined; therefore, field duplicate assessments were not performed.

3.9 Sensitivity

The samples were reported to the MDL. Elevated non-detect results were not reported.

The RL and MDL met the RL and MDL criteria in QAPP Table 1.

3.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

ATTACHMENT 3 PCB Qualifications

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
G-S-2-1	PCB-1248	33000	NA	33000	J	13
G-S-2-1	PCB-1254	14000	NA	14000	J	13
G-S-2-1	PCB-1260	1000	NA	1000	J	13
G-S-2-2	PCB-1248	2300	NA	2300	J	13
G-S-2-2	PCB-1254	1000	NA	1000	J	13
G-S-2-2	PCB-1260	150	NA	150	J	13
G-S-2-3	PCB-1248	1400	NA	1400	J	13
G-S-2-3	PCB-1254	580	NA	580	J	13
G-S-2-3	PCB-1260	36	NA	36	J	13
G-S-3-1	PCB-1248	5200	NA	5200	J	13
G-S-3-1	PCB-1254	2200	NA	2200	J	13
G-S-3-1	PCB-1260	200	NA	200	J	13
G-S-3-2	PCB-1248	700	NA	700	J	13
G-S-3-2	PCB-1254	260	NA	260	J	13
G-S-3-2	PCB-1260	85	NA	85	J	13
G-S-3-3	PCB-1248	1000	NA	1000	J	13
G-S-3-3	PCB-1254	1200	NA	1200	J	13
G-S-3-3	PCB-1260	110	NA	110	J	13
G-S-3-4	PCB-1248	130	NA	130	J	13
G-S-3-4	PCB-1254	190	NA	190	J	13
G-S-3-4	PCB-1260	52	NA	52	J	13
G-S-4-1	PCB-1248	3600	NA	3600	J	13
G-S-4-1	PCB-1254	1500	NA	1500	J	13
G-S-4-1	PCB-1260	140	NA	140	J	13
G-S-4-2	PCB-1248	1600	NA	1600	J	13
G-S-4-2	PCB-1254	860	NA	860	J	13
G-S-4-2	PCB-1260	83	NA	83	J	13
G-S-4-3	PCB-1248	1500	NA	1500	J	13
G-S-4-3	PCB-1254	720	NA	720	J	13
G-S-4-3	PCB-1260	60	NA	60	J	13
E-N-1-1	PCB-1248	390	NA	390	J	13
E-N-1-1	PCB-1254	440	NA	440	J	13

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
E-N-1-1	PCB-1260	51	NA	51	J	13
E-N-2-1	PCB-1248	1800	NA	1800	J	13
E-N-2-1	PCB-1254	890	NA	890	J	13
E-N-2-1	PCB-1260	130	NA	130	J	13
E-S-3-2	PCB-1248	890	NA	890	J	13
E-S-3-2	PCB-1254	360	NA	360	J	13
E-S-3-2	PCB-1260	130	NA	130	J	13
E-S-4-2	PCB-1248	770	NA	770	J	13
E-S-4-2	PCB-1254	1400	NA	1400	J	13
E-S-4-2	PCB-1260	140	NA	140	J	13
E-S-5-2	PCB-1248	3600	NA	3600	J	13
E-S-5-2	PCB-1254	2000	NA	2000	J	13
E-S-5-2	PCB-1260	230	NA	230	J	13
B-E-1	PCB-1248	2300	NA	2300	J	13
B-E-1	PCB-1254	630	NA	630	J	13
B-E-1	PCB-1260	170	NA	170	J	13
B-E-2	PCB-1248	5200	NA	5200	J	13
B-E-2	PCB-1254	1800	NA	1800	J	13
B-E-2	PCB-1260	510	NA	510	J	13
B-E-3	PCB-1248	660	NA	660	J	13
B-E-3	PCB-1254	590	NA	590	J	13
B-E-3	PCB-1260	230	NA	230	J	13
B-E-5	PCB-1248	220	NA	220	J	13
B-E-5	PCB-1254	280	NA	280	J	13
B-E-5	PCB-1260	130	NA	130	J	13
B-S-4	PCB-1248	900	NA	900	J	13
B-S-4	PCB-1254	1400	NA	1400	J	13
DUP-1	PCB-1248	1900	NA	1900	J	13
DUP-1	PCB-1254	1100	NA	1100	J	13
DUP-1	PCB-1260	240	NA	240	J	13
DUP-2	PCB-1248	1000	NA	1000	J	13
DUP-2	PCB-1254	350	NA	350	J	13
DUP-2	PCB-1260	69	NA	69	J	13
E-N-2-3	PCB-1248	3200	NA	3200	J	13

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
E-N-2-3	PCB-1254	1300	NA	1300	J	13
E-N-2-3	PCB-1260	390	NA	390	J	13
E-N-3-1	PCB-1248	2000	NA	2000	J	13
E-N-3-1	PCB-1254	730	NA	730	J	13
E-N-3-1	PCB-1260	150	NA	150	J	13
E-N-3-2	PCB-1248	2900	NA	2900	J	13
E-N-3-2	PCB-1254	970	NA	970	J	13
E-N-3-2	PCB-1260	200	NA	200	J	13
E-N-3-3	PCB-1248	1200	NA	1200	J	13
E-N-3-3	PCB-1254	530	NA	530	J	13
E-N-3-3	PCB-1260	170	NA	170	J	13
E-N-3-4	PCB-1248	320	NA	320	J	13
E-N-3-4	PCB-1254	490	NA	490	J	13
E-N-4-1	PCB-1248	560	NA	560	J	13
E-N-4-1	PCB-1254	220	NA	220	J	13
E-N-4-1	PCB-1260	68	NA	68	J	13
E-N-4-2	PCB-1248	390	NA	390	J	13
E-N-4-2	PCB-1254	160	NA	160	J	13
E-N-4-2	PCB-1260	45	NA	45	J	13
E-N-4-3	PCB-1248	170	NA	170	J	13
E-N-4-3	PCB-1254	150	NA	150	J	13
E-N-4-3	PCB-1260	57	NA	57	J	13
E-N-5-1	PCB-1248	1200	NA	1200	J	13
E-N-5-1	PCB-1254	1700	NA	1700	J	13
E-N-5-1	PCB-1260	280	NA	280	J	13
S-N-3-1	PCB-1248	320	NA	320	J	13
S-N-3-1	PCB-1254	200	NA	200	J	13
S-N-3-1	PCB-1260	91	NA	91	J	13
S-N-4-2	PCB-1248	460	NA	460	J	13
S-N-4-2	PCB-1254	310	NA	310	J	13
S-N-4-2	PCB-1260	130	NA	130	J	13
S-N-5-1	PCB-1248	110	NA	110	J	13
S-N-5-1	PCB-1254	59	NA	59	J	13
S-N-5-1	PCB-1260	25	NA	25	J	13

µg/kg-microgram per kilogram

Former Sperry Remington Site-North

29 November 2018

Page 16

NA-not applicable

Memorandum

Date: 29 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-80306-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of seventeen solid samples, including two samples for matrix spike/matrix spike duplicate (MS/MSD) analyses and three field duplicate samples, collected July 27, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Metals by EPA Methods 3050B/6010C
- Mercury by EPA Method 7471B
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review, January 2017 (EPA 540-R-2017-001), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-80306-1	W1-2
180-80306-2	W2-3
180-80306-2 MS	W2-3 MS
180-80306-2 MSD	W2-3 MSD
180-80306-3	W3-1
180-80306-4	W3-2
180-80306-5	W4-2
180-80306-6	W6-1
180-80306-6 MS	W6-1 MS
180-80306-6 MSD	W6-1 MSD
180-80306-7	W7-1
180-80306-8	W7-2

Laboratory ID	Client ID
180-80306-9	W8-1
180-80306-10	W9-2
180-80306-11	W10-1
180-80306-12	W10-2
180-80306-13	W11-1
180-80306-14	W11-2
180-80306-15	W12-1
180-80306-16	W12-2
180-80306-17	W6-3
180-80306-18	DUP-1
180-80306-19	DUP-2
180-80306-20	DUP-3

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issues were noted with the chain of custody (COC) form:

- Incorrect error corrections were observed on the COC, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.
- No collection times were documented on the COC for the field duplicate samples. The laboratory assigned collection times of 00:00.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times

- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 **Overall Assessment**

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- Two PCB 1248 peak %Ds were outside the method specified acceptance criteria on gas chromatography (GC) column CLP1 in a CCV in batch 253212 (CCV 180-253212/4). Since the PCB 1248 concentrations in the associated samples were reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.
- The PCB 1016 %Ds in CCVs in batch 253212 (CCVIS 180-253212/26 and CCVIS 180-253212/48) were outside the method specified acceptance criteria on GC column CLP1. Since the bias was high and PCB 1016 was not detected in the associated samples, no qualifications were applied to the data.
- One PCB 1248 peak %D was outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 253474 (CCV 180-253474/4). Since the PCB 1248 concentrations in the associated samples were reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.
- One or two PCB 1016 peaks had a %D that was outside the method specified acceptance criteria on GC column CLP-1 in a CCVs in batch 253474 (CCVIS 180-253474/5 and CCVIS 180-253474/26). Since the biases were high and PCB 1016 was not detected in the associated samples, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
W1-2	PCB-1248	1100	NA	1100	J	13
W1-2	PCB-1254	460	NA	460	J	13
W1-2	PCB-1260	120	NA	120	J	13
W2-3	PCB-1248	720	NA	720	J	13
W2-3	PCB-1254	290	NA	290	J	13
W2-3	PCB-1260	83	NA	83	J	13
W3-1	PCB-1248	150	NA	150	J	13
W3-1	PCB-1254	48	NA	48	J	13
W3-1	PCB-1260	7.9	J	7.9	J	13
W3-2	PCB-1248	990	NA	990	J	13
W3-2	PCB-1254	230	NA	230	J	13
W3-2	PCB-1260	60	NA	60	J	13
W4-2	PCB-1248	1100	NA	1100	J	13
W4-2	PCB-1254	440	NA	440	J	13
W4-2	PCB-1260	140	NA	140	J	13
W6-1	PCB-1248	140	NA	140	J	13
W6-1	PCB-1254	76	NA	76	J	13
W6-1	PCB-1260	23	NA	23	J	13
W7-1	PCB-1248	100	NA	100	J	13
W7-1	PCB-1254	70	NA	70	J	13
W7-1	PCB-1260	10	J	10	J	13
W7-2	PCB-1248	380	NA	380	J	13
W7-2	PCB-1254	180	NA	180	J	13
W7-2	PCB-1260	52	NA	52	J	13
W8-1	PCB-1248	2300	NA	2300	J	13
W8-1	PCB-1254	1200	NA	1200	J	13
W8-1	PCB-1260	210	NA	210	J	13
W9-2	PCB-1248	1200	NA	1200	J	13
W9-2	PCB-1254	580	NA	580	J	13
W9-2	PCB-1260	170	NA	170	J	13
W10-1	PCB-1248	790	NA	790	J	13
W10-1	PCB-1254	650	NA	650	J	13
W10-1	PCB-1260	260	NA	260	J	13
W10-2	PCB-1248	180	NA	180	J	13

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
W10-2	PCB-1254	85	NA	85	J	13
W10-2	PCB-1260	27	NA	27	J	13
W11-1	PCB-1248	620	NA	620	J	13
W11-1	PCB-1254	690	NA	690	J	13
W11-1	PCB-1260	280	NA	280	J	13
W11-2	PCB-1248	540	NA	540	J	13
W11-2	PCB-1254	570	NA	570	J	13
W11-2	PCB-1260	150	NA	150	J	13
W12-1	PCB-1248	510	NA	510	J	13
W12-1	PCB-1254	240	NA	240	J	13
W12-1	PCB-1260	63	NA	63	J	13
W12-2	PCB-1248	270	NA	270	J	13
W12-2	PCB-1254	410	NA	410	J	13
W12-2	PCB-1260	160	NA	160	J	13
W6-3	PCB-1248	390	NA	390	J	13
W6-3	PCB-1254	170	NA	170	J	13
W6-3	PCB-1260	36	NA	36	J	13
DUP-1	PCB-1248	1100	NA	1100	J	13
DUP-1	PCB-1254	520	NA	520	J	13
DUP-1	PCB-1260	130	NA	130	J	13
DUP-2	PCB-1248	630	NA	630	J	13
DUP-2	PCB-1254	550	NA	550	J	13
DUP-2	PCB-1260	210	NA	210	J	13
DUP-3	PCB-1248	350	NA	350	J	13
DUP-3	PCB-1254	500	NA	500	J	13
DUP-3	PCB-1260	200	NA	200	J	13

µg/kg-microgram per kilogram

NA-not applicable

J-the result is less than the reporting limit (RL) but greater than the method detection limit (MDL) and the concentration is an approximate value

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 253196 and 253333). PCBs were not detected in the method blanks above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate

Two sample set specific MS/MSD pairs were reported, using samples W2-3 and W6-1. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported, with the following exception.

The tetrachloro-m-xylene recovery on GC column CLP in sample W10-2 was high and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Field Duplicate

Three field duplicates, DUP1, DUP-2 and DUP-3, were collected with the sample set. However, the original samples could not be determined; therefore, field duplicate assessments were not performed.

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilution analyzed.

The RLs and MDLs for the following analytes did not meet the RL and MDL criteria in QAPP Table 1.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

2.0 METALS

The samples were analyzed for metals by EPA methods 3050B/6010C (Mercury evaluated separately in Section 3.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate

- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

2.1 Overall Assessment

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

2.2 Holding Times

The holding time for metals analysis of solid samples is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 252645). The metals were not detected in the method blank above the MDLs, with the following exceptions.

Aluminum, iron and manganese were detected in the method blank at estimated concentrations greater than the MDLs and less than the RLs. Since these metals were detected above the RLs in the associated samples, no qualifications were applied to the data, based on professional and technical judgment.

2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

2.6 Laboratory Duplicate

A laboratory duplicate was not reported with the sample set.

2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

2.8 Field Duplicate

Three field duplicates, DUP1, DUP-2 and DUP-3, were collected with the sample set. However, the original samples could not be determined; therefore, field duplicate assessments were not performed.

2.9 Sensitivity

The samples were reported to the MDLs. No elevated non-detect results were reported.

The RLs and MDLs met the RL and MDL criteria in QAPP Table 1.

2.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

3.0 MERCURY

The samples were analyzed for mercury by EPA method 7471B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity

✓ Electronic Data Deliverable Review

3.1 Overall Assessment

The mercury data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

3.2 Holding Times

The holding time for the mercury analysis of solid samples is 28 days from sample collection to analysis. The holding time was met for the sample analyses.

3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 254073). Mercury was not detected in the method blank above the MDL.

3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery result was within the laboratory specified acceptance criteria.

3.6 Laboratory Duplicate

A laboratory duplicate was not reported.

3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

3.8 Field Duplicate

Three field duplicates, DUP1, DUP-2 and DUP-3, were collected with the sample set. However, the original samples could not be determined; therefore, field duplicate assessments were not performed.

3.9 Sensitivity

The samples were reported to the MDL. Elevated non-detect results were not reported.

The RL and MDL met the RL and MDL criteria in QAPP Table 1.

3.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 29 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-80306-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of three solid samples collected August 2, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Volatile Organic Compounds (VOCs) by EPA Methods 5035/8260C
- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Metals by EPA Methods 3050B/6010C
- Mercury by EPA Method 7471B
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review, January 2017 (EPA 540-R-2017-001), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-80410-1	0S1A 08022018
180-80410-2	0S1B 08022018

Laboratory ID	Client ID
180-80410-3	0S1C 08022018

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 VOLATILE ORGANIC COMPOUNDS

The samples were analyzed for VOCs by EPA methods 5030C/8260C and 5035/8260C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Trip Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The VOC data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for these analyses, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) in the continuing calibration verification (CCV) standards:

- Chloromethane, dichlorodifluoromethane and vinyl chloride in the CCV in batch 252802 had %Ds that were high and outside the method specified acceptance criteria, with low biases. Since the %Ds of chloromethane and vinyl chloride were within the validation guidance acceptance criteria and based on professional and technical judgment, no qualifications were applied to the chloromethane and vinyl chloride data. However, the nondetect dichlorodifluoromethane results in the associated samples were UJ qualified as estimated less than the MDL.
- 1,4-Dioxane, acetone and trichlorofluoromethane in the CCV in batch 252802 had %Ds that were high and outside the method specified acceptance criteria, with high biases. Since 1,4-dioxane and trichlorofluoromethane were not detected in the associated samples, no qualifications were applied to the 1,4-dioxane and trichlorofluoromethane data. However, the acetone concentrations in the associated samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
OS1A 08022018	Acetone	14	J	14	J	9
OS1A 08022018	Dichlorodifluoromethane	3.4	U	3.4	UJ	9
OS1B 08022018	Acetone	78	NA	78	J	9
OS1B 08022018	Dichlorodifluoromethane	3.2	U	3.2	UJ	9

µg/kg-milligrams per kilogram

J-the result is less than the reporting limit (RL) but greater than the method detection limit (MDL) and the concentration is an approximate value

U- not detected at the MDL

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the VOC analysis of a preserved solid sample collected as a terracore are 48 hours until laboratory receipt and 14 days from sample collection to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 252802). VOCs were not detected in the method blank above the method detection limits (MDLs).

1.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria, with the following exception.

The LCS recovery of 1,4-dioxane was high and outside the laboratory specified acceptance criteria. Since 1,4-dioxane was not detected in the associated samples, no qualifications were applied to the data.

1.6 Surrogates

Acceptable surrogate recoveries were reported.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Trip Blank

Trip blanks were not shipped with the sample set.

1.9 Field Duplicate

Field duplicates were not collected with the sample set.

1.10 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were not reported.

The RLs and MDLs met the RL and MDL criteria in QAPP Table 1.

1.11 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

2.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

2.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the %Ds for the CCVs:

- One PCB 1248 peak %D was outside the method specified acceptance criteria on gas chromatography (GC) column CLP1 in a CCV in batch 253475 (CCV 180-253475/4). Since PCB 1248 was reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.

- The PCB 1016 %D in a CCV in batch 253475 (CCVIS 180-253475/5) was outside the method specified acceptance criteria on GC column CLP1. Since the bias was high and PCB 1016 was not detected in the associated samples, no qualifications were applied to the data.
- One PCB 1260 peak %D was outside the method specified acceptance criteria on gas chromatography (GC) column CLP1 in a CCV in batch 253475 (CCV 180-253475/5). Since the peak was not used for quantitation of the associated sample, no qualifications were applied to the data.
- Two PCB 1260 peaks had %Ds that were outside the method specified acceptance criteria on GC column CLP-2 in a CCVs in batch 253763 (CCVIS 180-253763/5). Since PCB 1260 was reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier	Reason Code
0S1B 08022018	PCB-1254	59000	NA	59000	J	13
0S1B 08022018	PCB-1260	4400	NA	4400	J	13
0S1C 08022018	PCB-1248	760	NA	760	J	13
0S1C 08022018	PCB-1254	220	NA	220	J	13
0S1C 08022018	PCB-1260	42	NA	42	J	13

µg/kg-milligrams per kilogram

NA-not applicable

2.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 253320 and 253337). PCBs were not detected in the method blanks above the MDLs.

2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

2.6 Surrogates

Acceptable surrogate recoveries were reported, with the following exceptions.

The tetrachloro-m-xylene recovery on GC column CLP in sample W10-2 was high and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

2.8 Field Duplicate

Field duplicates were not collected with the sample set.

2.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilution analyzed.

The RLs and MDLs for the following analytes did not meet the RL and MDL criteria in QAPP Table 1.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

2.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

3.0 METALS

The samples were analyzed for metals by EPA methods 3050B/6010C (Mercury evaluated separately in Section 3.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ⊗ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity

✓ Electronic Data Deliverable Review

3.1 Overall Assessment

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

3.2 Holding Times

The holding time for metals analysis of solid samples is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 253073). The metals were not detected in the method blank above the MDLs, with the following exception.

Chromium was detected in the method blank at an estimated concentration greater than the MDL and less than the RL. Since chromium was detected above the RL in the associated samples, no qualifications were applied to the data, based on professional and technical judgment.

3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

3.6 Laboratory Duplicate

A laboratory duplicate was not reported with the sample set.

3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

3.8 Field Duplicate

Field duplicates were not collected with the sample set.

3.9 Sensitivity

The samples were reported to the MDLs. No elevated non-detect results were reported.

The RLs and MDLs met the RL and MDL criteria in QAPP Table 1.

3.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

4.0 MERCURY

The samples were analyzed for mercury by EPA method 7471B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

4.1 Overall Assessment

The mercury data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of

valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

4.2 Holding Times

The holding time for the mercury analysis of solid samples is 28 days from sample collection to analysis. The holding time was met for the sample analyses.

4.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 254074). Mercury was not detected in the method blank above the MDL.

4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery result was within the laboratory specified acceptance criteria.

4.6 Laboratory Duplicate

A laboratory duplicate was not reported.

4.7 Equipment Blank

Equipment blanks were not collected with the sample set.

4.8 Field Duplicate

Field duplicates were not collected with the sample set.

4.9 Sensitivity

The samples were reported to the MDL. Elevated non-detect results were not reported.

The RL and MDL met the RL and MDL criteria in QAPP Table 1.

4.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 21 December 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-80462-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of twenty solid samples, including one sample for matrix spike/matrix spike duplicate (MS/MSD) analyses and two field duplicate samples, collected August 3, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Metals by EPA Methods 3050B/6010C
- Mercury by EPA Method 7471B
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review, January 2017 (EPA 540-R-2017-001), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-80462-1	SSHS-B1282-SUB-0-2
180-80462-1 MS	SSHS-B1282-SUB-0-2 MS
180-80462-1 MSD	SSHS-B1282-SUB-0-2 MSD
180-80462-2	SSHS-B1260-SUB-0-2
180-80462-3	E-2-2
180-80462-4	E-3-1
180-80462-5	E-3-2
180-80462-6	SSHS-B1261-SUB-0-2
180-80462-7	E-4-2
180-80462-8	SSHS-B1320-SUB-2-4
180-80462-9	E-S-7-1
180-80462-10	E-N-8-2

Laboratory ID	Client ID
180-80462-11	E-S-9-1
180-80462-12	E-S-9-2
180-80462-13	SSHS-B1346-SUB-4-6
180-80462-14	E-S-9-4
180-80462-15	E-S-1-1
180-80462-16	E-S-1-2
180-80462-17	E-S-1-3
180-80462-18	E-S-1-4
180-80462-19	E-S-8-1
180-80462-20	E-S-8-2
180-80462-21	DUP-1 08032018
180-80462-22	DUP-2 08032018

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issues were noted with the chain of custody (COC) form:

- Incorrect error corrections were observed on the COC, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.
- No collection times were documented on the COC for the field duplicate samples. The laboratory assigned collection times of 00:00.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank

- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- Two PCB 1254 peaks %D were outside the method specified acceptance criteria on gas chromatography (GC) column CLP2 in a CCV in batch 253755 (CCV 180-253755/1). Since PCB 1254 concentrations in the associated samples were reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.
- Three PCB 1248 peak %Ds on GC column CLP1 and two PCB 1248 peaks on GC column CLP2 were outside the method specified acceptance criteria in a CCV in batch 253755 (CCV 180-253755/4). Since PCB 1254 concentrations in the associated samples were reported from the three PCB 1248 peaks from GC column CLP2 which had acceptable %Ds, no qualifications were applied to the data.
- Two PCB 1016 peak %Ds were outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 253755 (CCV 180-253755/5). Since the bias was high and PCB 1016 was not detected in the associated samples, no qualifications were applied to the data.
- Two PCB 1254 peak %Ds were outside the method specified acceptance criteria on GC column CLP2 in a CCV in batch 253877 (CCV 180-253877/1). Since PCB 1254 concentrations in the associated samples were reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.

- The PCB 1016 %Ds were outside the method specified acceptance criteria on both GC columns in a CCV in batch 253877 (CCV 180-253877/26). Since the bias was high and PCB 1016 was not detected in the associated samples, no qualifications were applied to the data.
- One PCB 1260 peak %D was outside the method specified acceptance criteria on GC column CLP2 in a CCV in batch 253877 (CCV 180-253877/26). Since the PCB 1260 concentrations in the associated samples were reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.
- One PCB 1248 peak %D was outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254047 (CCV 180-254047/4). Since PCB 1248 concentrations in the associated samples were reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

In addition, one PCB concentration was flagged with p, indicating that the relative percent difference (RPD) between the primary and confirmation GC columns was >40%; the lower value was reported. Therefore, based on professional and technical judgment, the concentration of PCB 1260 in this sample was J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1282-SUB-0-2	PCB-1248	830	NA	830	J	13
SSHS-B1282-SUB-0-2	PCB-1254	610	NA	610	J	13
SSHS-B1282-SUB-0-2	PCB-1260	120	NA	120	J	13
SSHS-B1260-SUB-0-2	PCB-1248	33	NA	33	J	13
SSHS-B1260-SUB-0-2	PCB-1254	56	NA	56	J	13
SSHS-B1260-SUB-0-2	PCB-1260	18	J	18	J	13
E-2-2	PCB-1248	200	NA	200	J	13
E-2-2	PCB-1254	250	NA	250	J	13
E-2-2	PCB-1260	64	NA	64	J	13
E-3-1	PCB-1248	65	NA	65	J	13
E-3-1	PCB-1254	99	NA	99	J	13
E-3-1	PCB-1260	27	NA	27	J	13

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
E-3-2	PCB-1248	150	NA	150	J	13
E-3-2	PCB-1254	120	NA	120	J	13
E-3-2	PCB-1260	27	NA	27	J	13
SSHS-B1261-SUB-0-2	PCB-1248	1900	NA	1900	J	13
SSHS-B1261-SUB-0-2	PCB-1254	850	NA	850	J	13
SSHS-B1261-SUB-0-2	PCB-1260	180	NA	180	J	13
E-4-2	PCB-1248	36000	NA	36000	J	13
E-4-2	PCB-1254	8300	NA	8300	J	13
E-4-2	PCB-1260	1600	NA	1600	J	13
SSHS-B1320-SUB-2-4	PCB-1248	18000	NA	18000	J	13
SSHS-B1320-SUB-2-4	PCB-1254	2400	NA	2400	J	13
SSHS-B1320-SUB-2-4	PCB-1260	600	NA	600	J	13
E-S-7-1	PCB-1248	2300	NA	2300	J	13
E-S-7-1	PCB-1254	1500	NA	1500	J	13
E-S-7-1	PCB-1260	430	NA	430	J	13
E-N-8-2	PCB-1248	14000	NA	14000	J	13
E-N-8-2	PCB-1254	4500	NA	4500	J	13
E-N-8-2	PCB-1260	760	NA	760	J	13
E-S-9-1	PCB-1248	4800	NA	4800	J	13
E-S-9-1	PCB-1254	2000	NA	2000	J	13
E-S-9-1	PCB-1260	340	p	340	J	13
E-S-9-2	PCB-1248	3000	NA	3000	J	13
E-S-9-2	PCB-1254	1000	NA	1000	J	13
E-S-9-2	PCB-1260	200	NA	200	J	13
SSHS-B1346-SUB-4-6	PCB-1248	1300	NA	1300	J	13
SSHS-B1346-SUB-4-6	PCB-1254	530	NA	530	J	13
SSHS-B1346-SUB-4-6	PCB-1260	130	NA	130	J	13
E-S-9-4	PCB-1248	9100	NA	9100	J	13
E-S-9-4	PCB-1254	3000	NA	3000	J	13
E-S-9-4	PCB-1260	640	NA	640	J	13
E-S-1-1	PCB-1248	200000	NA	200000	J	13
E-S-1-1	PCB-1254	51000	NA	51000	J	13
E-S-1-1	PCB-1260	7200	NA	7200	J	13
E-S-1-2	PCB-1248	590	NA	590	J	13
E-S-1-2	PCB-1254	400	NA	400	J	13
E-S-1-2	PCB-1260	130	NA	130	J	13
E-S-1-3	PCB-1248	130	NA	130	J	13
E-S-1-3	PCB-1254	170	NA	170	J	13
E-S-1-3	PCB-1260	82	NA	82	J	13
E-S-1-4	PCB-1248	240	NA	240	J	13

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
E-S-1-4	PCB-1254	110	NA	110	J	13
E-S-1-4	PCB-1260	34	NA	34	J	13
E-S-8-1	PCB-1248	13000	NA	13000	J	13
E-S-8-1	PCB-1254	3800	NA	3800	J	13
E-S-8-1	PCB-1260	610	NA	610	J	13
E-S-8-2	PCB-1248	9900	NA	9900	J	13
E-S-8-2	PCB-1254	2800	NA	2800	J	13
E-S-8-2	PCB-1260	470	NA	470	J	13
DUP-1 08032018	PCB-1248	2600	NA	2600	J	13
DUP-1 08032018	PCB-1254	710	NA	710	J	13
DUP-1 08032018	PCB-1260	130	NA	130	J	13
DUP-2 08032018	PCB-1248	630	NA	630	J	13
DUP-2 08032018	PCB-1254	260	NA	260	J	13
DUP-2 08032018	PCB-1260	54	NA	54	J	13

µg/kg-milligrams per kilogram

J-the result is less than the reporting limit (RL) but greater than the method detection limit (MDL) and the concentration is an approximate value

p-laboratory flag indicating the RPDs between the primary and confirmation GC column was >40%; the lower value was reported

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 253679 and 253825). PCBs were not detected in the method blanks above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MS/MSD pairs were reported, using samples SSHS-B1282-SUB-0-2 and E-N-8-2. The recovery and RPD results were within the laboratory specified acceptance criteria, with the following exceptions.

The recoveries of PCB-1016 in the MS/MSD pair using sample E-N-8-2 were high and outside the laboratory specified acceptance criteria. However, based on the contribution from PCB 1248 from the sample and professional and technical judgment, no qualifications were applied to the data.

1.5 **Laboratory Control Sample (LCS)**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 **Surrogates**

Acceptable surrogate recoveries were reported, with the following exception.

The tetrachloro-m-xylene recovery on GC column CLP in sample W10-2 was high and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

1.7 **Equipment Blank**

Equipment blanks were not collected with the sample set.

1.8 **Field Duplicate**

Two field duplicate samples, DUP-1 08032018 and DUP-2 08032018, were collected with the sample sets. Acceptable precision [RPD <50% for results greater than five times the RL] was demonstrated between the field duplicates and the original samples, SSHS-B1282-SUB-0-2 and SSHS-B1261-SUB-0-2 indicated in the table below, with the following exceptions.

The RPDs of PCB 1248 in field duplicate pair SSHS-B1282-SUB-0-2/DUP-1 08032018 and PCB-1248, PCB-1254 and PCB-1260 in field duplicate pair SSHS-B1261-SUB-0-2/DUP-2 08032018 were greater than 50%. Therefore, the PCB 1248 concentrations in field duplicate pair SSHS-B1282-SUB-0-2/DUP-1 08032018 and PCB-1248, PCB-1254 and PCB-1260 concentrations in field duplicate pair SSHS-B1261-SUB-0-2/DUP-2 08032018 were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	RPD	Validation Result (µg/kg)	Validation Qualifier	Reason Code
SSHS-B1282-SUB-0-2	PCB-1248	830	NA	103	830	J	7
DUP-1 08032018	PCB-1248	2600	NA		2600	J	7

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	RPD	Validation Result (µg/kg)	Validation Qualifier	Reason Code
SSHS-B1261-SUB-0-2	PCB-1248	1900	NA	100	1900	J	7
DUP-2 08032018	PCB-1248	630	NA		630	J	7
SSHS-B1261-SUB-0-2	PCB-1254	850	NA	106	850	J	7
DUP-2 08032018	PCB-1254	260	NA		260	J	7
SSHS-B1261-SUB-0-2	PCB-1260	180	NA	108	180	J	7
DUP-2 08032018	PCB-1260	54	NA		54	J	7

µg/kg-milligrams per kilogram

NA-not applicable

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilutions analyzed.

The RLs and MDLs for the following analytes did not meet the RL and MDL criteria in QAPP Table 1.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

2.0 METALS

The samples were analyzed for metals by EPA methods 3050B/6010C.
(Mercury evaluated separately in Section 3.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

2.1 Overall Assessment

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

2.2 Holding Times

The holding time for metals analysis of solid samples is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 253070). The metals were not detected in the method blank above the MDLs.

2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair was reported, using samples SSHS-B1282-SUB-0-2. The recovery and RPD results were within the laboratory specified acceptance criteria with the following exceptions.

The recoveries of aluminum, calcium, copper, iron, lead and manganese were flagged with 4, to indicate the sample concentrations were greater than four times the spike concentrations; therefore, the recovery limits were not applicable. Therefore, no qualifications were applied to the aluminum, copper, iron, lead and manganese data.

The MS recovery of cadmium and MSD recovery of zinc were low and outside the laboratory specified acceptance criteria. Therefore, the nondetect cadmium result was UJ qualified as estimated less than the MDL and the zinc concentration was J- qualified as estimated with low biases in sample SSHS-B1282-SUB-0-2.

Sample	Analyte	Laboratory Result (mg/kg)	Laboratory Flag	Validation Result (mg/kg)	Validation Qualifier	Reason Code
SSHS-B1282-SUB-0-2	Cadmium	0.043	U,F1	0.043	UJ	4
SSHS-B1282-SUB-0-2	Zinc	180	F1	180	J-	4

mg/kg-milligrams per kilogram

U- not detected at the MDL

F1-laboratory flag indicating the MS and/or MSD recovery is outside acceptance limits

2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

2.6 Laboratory Duplicate

A laboratory duplicate was not reported with the sample set.

2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

2.8 Field Duplicate

Two field duplicate samples, DUP-1 08032018 and DUP-2 08032018, were collected with the sample set. Acceptable precision [RPD <50% for results greater than five times the RL] was demonstrated between the field duplicates and the original samples, SSHS-B1282-SUB-0-2 and SSHS-B1261-SUB-0-2 with the following exceptions indicated in the table below.

The RPDs of calcium and copper in field duplicate pair SSHS-B1282-SUB-0-2/DUP-1 08032018 and arsenic and lead in field duplicate pair SSHS-B1261-SUB-0-2/DUP-2 08032018 were greater than 50%. Therefore, the calcium and copper concentrations in field duplicate pair SSHS-B1282-SUB-0-2/DUP-1 08032018 and arsenic and lead concentrations in field duplicate pair SSHS-B1261-SUB-0-2/DUP-2 08032018 were J qualified as estimated.

Sample	Analyte	Laboratory Result (mg/kg)	Laboratory Flag	RPD	Validation Result (mg/kg)	Validation Qualifier	Reason Code
SSHS-B1282-SUB-0-2	Calcium	23000	F1	56	23000	J	7
DUP-1 08032018	Calcium	13000	NA		13000	J	7
SSHS-B1282-SUB-0-2	Copper	270	NA	51	270	J	7
DUP-1 08032018	Copper	160	NA		160	J	7
SSHS-B1261-SUB-0-2	Arsenic	6.4	NA	53	6.4	J	7
DUP-2 08032018	Arsenic	11	NA		11	J	7
SSHS-B1261-SUB-0-2	Lead	16	NA	69	16	J	7
DUP-2 08032018	Lead	33	NA		33	J	7

mg/kg-milligrams per kilogram

F1-laboratory flag indicating the MS and/or MSD recovery is outside acceptance limits

NA-not applicable

2.9 Sensitivity

The samples were reported to the MDLs. No elevated non-detect results were reported.

The RLs and MDLs met the RL and MDL criteria in QAPP Table 1.

2.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

3.0 MERCURY

The samples were analyzed for mercury by EPA method 7471B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

3.1 Overall Assessment

The mercury data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

3.2 Holding Times

The holding time for the mercury analysis of solid samples is 28 days from sample collection to analysis. The holding time was met for the sample analyses.

3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 254438). Mercury was not detected in the method blank above the MDL.

3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair was reported, using samples SSHS-B1282-SUB-0-2. The recovery and RPD results were within the laboratory specified acceptance criteria.

3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery result was within the laboratory specified acceptance criteria.

3.6 Laboratory Duplicate

A laboratory duplicate was not reported.

3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

3.8 Field Duplicate

Two field duplicate samples, DUP-1 08032018 and DUP-2 08032018, were collected with the sample sets. Acceptable precision [RPD <50% for results greater than five times the RL] was demonstrated between the field duplicates and the original samples, SSHS-B1282-SUB-0-2 and SSHS-B1261-SUB-0-2.

3.9 Sensitivity

The samples were reported to the MDL. No elevated non-detect results were reported.

The RL and MDL met the RL and MDL criteria in QAPP Table 1.

3.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 21 December 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-80512-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of five solid samples, including one sample for matrix spike/matrix spike duplicate (MS/MSD) analyses and one field duplicate samples, collected August 6, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Metals by EPA Methods 3050B/6010C
- Mercury by EPA Method 7471B
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review, January 2017 (EPA 540-R-2017-001), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-80512-1	E-5-1
180-80512-2	E-6-1
180-80512-3	E-7-1

Laboratory ID	Client ID
180-80512-4	N-E-0
180-80512-5	N-E-1
180-80512-6	DUP-1

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issue was noted with the chain of custody (COC) form:

- No collection times were documented on the COCs for the field duplicate sample. The laboratory assigned collection times of 00:00.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid

analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- One PCB 1248 peak %D was outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254050 (CCV 180-254050/4). Since the peak was not used for sample quantitation, no qualifications were applied to the data.
- One PCB 1016 peak %D was outside the method specified acceptance criteria on both GC columns in a CCV in batch 254050 (CCV 180-254050/5). Since the bias was high and PCB 1016 was not detected in the associated samples, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
N-E-0	PCB-1248	160	NA	160	J	13
N-E-0	PCB-1254	110	NA	110	J	13
N-E-0	PCB-1260	32	NA	32	J	13
N-E-1	PCB-1248	340	NA	340	J	13
N-E-1	PCB-1254	180	NA	180	J	13
N-E-1	PCB-1260	48	NA	48	J	13

µg/kg-microgram per kilogram

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 253823). PCBs were not detected in the method blank above the method detection limits (MDLs).

1.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

1.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Field Duplicate

One field duplicate sample, DUP-1, was collected with the sample set but was not reported for PCBs.

1.9 Sensitivity

The samples were reported to the MDLs. No elevated non-detect results were reported.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

2.0 METALS

The samples were analyzed for metals by EPA methods 3050B/6010C (Mercury evaluated separately in Section 3.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

2.1 Overall Assessment

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

2.2 Holding Times

The holding time for metals analysis of solid samples is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 253279). The metals were not detected in the method blank above the MDLs.

2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair was reported, using sample E-6-1. The recovery and RPD results were within the laboratory specified acceptance criteria, with the following exceptions.

The recoveries of aluminum, copper, iron, lead and manganese were flagged with 4, to indicate the sample concentrations were greater than four times the spike concentrations; therefore, the recovery limits were not applicable. Therefore, no qualifications were applied to the aluminum, copper, iron, lead and manganese data.

One or both the MS/MSD recoveries of antimony, cadmium, calcium, chromium, nickel and zinc were low and the RPD of chromium and nickel were high, all outside the laboratory specified acceptance criteria. Therefore, the nondetect cadmium result was UJ qualified as estimated less than the MDL and antimony, calcium and zinc concentrations was J- qualified as estimated with low biases, and the chromium and nickel concentrations were J qualified as estimated in sample E-6-1.

Sample	Analyte	Laboratory Result (mg/kg)	Laboratory Flag	Validation Result (mg/kg)	Validation Qualifier	Reason Code
E-6-1	Antimony	3.9	F1	3.9	J-	4
E-6-1	Cadmium	0.041	U,F1	0.041	UJ	4
E-6-1	Calcium	16000	F1	16000	J-	4
E-6-1	Chromium	38	F1,F2	38	J	4
E-6-1	Nickel	140	F1,F2	140	J	4
E-6-1	Zinc	210	F1	210	J-	4

mg/kg-milligrams per kilogram

U-not detected at or above the MDL

F1-laboratory flag indicating MS and/or MSD recovery was outside acceptance limits

F2-laboratory flag indicating MS/MSD RPD was outside acceptance limits

2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

2.6 Laboratory Duplicate

A laboratory duplicate was not reported with the sample set.

2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

2.8 Field Duplicate

One field duplicate sample, DUP-1, was collected with the sample set. Acceptable precision [RPD <50% for results greater than five times the RL] was demonstrated between the field duplicate and the original sample, E-5-1, with the following exceptions.

The RPDs of antimony, lead and zinc were greater than 50%. Therefore, the antimony, lead and zinc concentration in the field duplicate pair were J qualified as estimated.

Sample	Analyte	Laboratory Result (mg/kg)	Laboratory Flag	RPD	Validation Result (mg/kg)	Validation Qualifier	Reason Code
E-5-1	Antimony	8.9	NA	112	8.9	J	7
DUP-1	Antimony	2.5	NA		2.5	J	7

Sample	Analyte	Laboratory Result (mg/kg)	Laboratory Flag	RPD	Validation Result (mg/kg)	Validation Qualifier	Reason Code
E-5-1	Lead	240	NA	87	240	J	7
DUP-1	Lead	610	NA		610	J	7
E-5-1	Zinc	280	NA	55	280	J	7
DUP-1	Zinc	160	NA		160	J	7

mg/kg-milligrams per kilogram
NA-not applicable

2.9 Sensitivity

The samples were reported to the MDLs. No elevated non-detect results were reported.

The RLs and MDLs met the RL and MDL criteria in QAPP Table 1.

2.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

3.0 MERCURY

The samples were analyzed for mercury by EPA method 7471B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity

✓ Electronic Data Deliverable Review

3.1 Overall Assessment

The mercury data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

3.2 Holding Times

The holding time for the mercury analysis of solid samples is 28 days from sample collection to analysis. The holding time was met for the sample analyses.

3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 254441). Mercury was not detected in the method blank above the MDL.

3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair was reported, using sample E-6-1. The recovery and RPD results were within the laboratory specified acceptance criteria, with the following exception.

The MSD recovery was high and outside the laboratory specified acceptance criteria. Therefore, the mercury concentration in sample was J+ qualified as estimated with high bias.

Sample	Analyte	Laboratory Result (mg/kg)	Laboratory Flag	Validation Result (mg/kg)	Validation Qualifier	Reason Code
E-6-1	Mercury	0.078	F1	0.078	J+	4

mg/kg-milligrams per kilogram

U-not detected at or above the MDL

F1-laboratory flag indicating MS and/or MSD recovery was outside acceptance limits

3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery result was within the laboratory specified acceptance criteria.

3.6 Laboratory Duplicate

A laboratory duplicate was not reported.

3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

3.8 Field Duplicate

One field duplicate sample, DUP-1, was collected with the sample set. Acceptable precision [RPD <50% for results greater than five times the RL] was demonstrated between the field duplicate and the original sample, E-5-1.

3.9 Sensitivity

The samples were reported to the MDL. No elevated non-detect results were reported.

The RL and MDL met the RL and MDL criteria in QAPP Table 1.

3.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 30 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-80546-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of two solid samples, collected August 7, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-80546-1	PW-1

Laboratory ID	Client ID
180-80546-2	PE-1

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- Two PCB 1254 peak %Ds were outside the method specified acceptance criteria on gas chromatography (GC) column CLP1 in a CCV in batch 254176 (CCV 180-254176/1).

Since PCB 1254 was reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.

- One PCB 1248 peak %D was outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254176 (CCV 180-254176/4). Since the peak was not used for sample quantitation, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
PW-1	PCB-1248	610	NA	610	J	13
PW-1	PCB-1254	210	NA	210	J	13
PW-1	PCB-1260	43	NA	43	J	13
PE-1	PCB-1248	170	NA	170	J	13
PE-1	PCB-1254	47	NA	47	J	13
PE-1	PCB-1260	11	J	11	J	13

µg/kg-microgram per kilogram

J-the result is less than the reporting limit (RL) but greater than the method detection limit (MDL) and the concentration is an approximate value

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 253838). PCBs were not detected in the method blank above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were not reported.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Field Duplicate

Field duplicates were not collected with the sample set.

1.9 Sensitivity

The samples were reported to the MDLs. No elevated non-detect results were reported.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 30 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-80713-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of nine solid samples including one sample for matrix spike/matrix spike duplicate (MS/MSD) analysis, collected August 9, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-80713-1	WL-01
180-80713-2	WL-02
180-80713-3	WL-03
180-80713-3 MS	WL-03 MS
180-80713-3 MSD	WL-03 MSD
180-80713-4	WL-04

Laboratory ID	Client ID
180-80713-5	P-2
180-80713-6	P-3
180-80713-7	P-4
180-80713-8	CS-01
180-80713-9	CS-02

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issues were noted with the chain of custody (COC) forms:

- Incorrect error corrections were observed on the COC, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid

analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- Two PCB 1254 peak %Ds were outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254176 (CCV 180-254176/1). Since PCB 1254 was reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.
- One PCB 1248 peak %D was outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254176 (CCV 180-254176/4). Since this peak was not used for sample quantitation, no qualifications were applied to the data.
- One PCB 1016 peak %D was outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254176 (CCV 180-254176/28). Since the bias was high and PCB 1016 was not detected in the associated samples, no qualifications were applied to the data.
- Two PCB 1254 peak %Ds were outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254345 (CCV 180-254345/1). Since these peaks were not used for sample quantitation, no qualifications were applied to the data.
- PCB 1016 %Ds were outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254345 (CCV 180-254345/5). Since the bias was high and PCB 1016 was not detected in the associated samples, no qualifications were applied to the data.
- One PCB 1260 peak %D was outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254345 (CCV 180-254345/5). Since this peak was not used for sample quantitation, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
WL-01	PCB-1248	1200	NA	1200	J	13
WL-01	PCB-1254	270	NA	270	J	13
WL-01	PCB-1260	72	NA	72	J	13
WL-02	PCB-1248	150	NA	150	J	13
WL-02	PCB-1254	38	NA	38	J	13
WL-03	PCB-1248	660	NA	660	J	13
WL-03	PCB-1254	200	NA	200	J	13
WL-03	PCB-1260	56	NA	56	J	13
WL-04	PCB-1248	150	NA	150	J	13
WL-04	PCB-1254	42	NA	42	J	13
WL-04	PCB-1260	12	J	12	J	13
P-2	PCB-1248	150	NA	150	J	13
P-2	PCB-1254	40	NA	40	J	13
P-2	PCB-1260	8.7	J	8.7	J	13
P-3	PCB-1248	320	NA	320	J	13
P-3	PCB-1254	88	NA	88	J	13
P-3	PCB-1260	32	NA	32	J	13
P-4	PCB-1248	88	NA	88	J	13
P-4	PCB-1254	37	NA	37	J	13
P-4	PCB-1260	9.4	J	9.4	J	13
CS-01	PCB-1248	4000	NA	4000	J	13
CS-01	PCB-1254	980	NA	980	J	13
CS-01	PCB-1260	340	NA	340	J	13
CS-02	PCB-1248	10000	NA	10000	J	13
CS-02	PCB-1254	2800	NA	2800	J	13
CS-02	PCB-1260	910	NA	910	J	13

µg/kg-microgram per kilogram

J-the result is less than the reporting limit (RL) but greater than the method detection limit (MDL) and the concentration is an approximate value

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 253991). PCBs were not detected in the method blank above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate

One sample set specific MS/MSD pair was reported, using sample WL-03. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Field Duplicate

Field duplicates were not collected with the sample set.

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilution analyzed.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 30 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-80802-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of three solid samples and one trip blank collected August 10, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Volatile Organic Compounds (VOCs) by EPA Methods 5035/8260C
- Semivolatile Organic Compounds (SVOCs) by EPA Methods 3541/8270D
- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data are usable for meeting project objectives.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-80802-1	SD-01
180-80802-2	SD-02

Laboratory ID	Client ID
180-80802-3	SSHS-B1501
180-80802-4	TRIP BLANK

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 VOLATILE ORGANIC COMPOUNDS

The samples were analyzed for VOCs by EPA methods 5030C/8260C and 5035/8260C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Trip Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The VOC data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for these analyses, for this sample set is 100%.

The narrative indicated following issue with the percent differences (%Ds) in continuing calibration verification (CCV) standards:

- Acetone in the CCV in batch 253609 had a %D that was high and outside the method specified acceptance criteria, with high bias. Since acetone was not detected in the associated sample, no qualifications were applied to the data.
- Dichlorodifluoromethane and methyl acetate in the CCV in batch 253609 had %Ds that were high and outside the method specified acceptance criteria, with low biases. Since the %Ds of dichlorodifluoromethane and methyl acetate were within the validation guidance acceptance criteria and based on professional and technical judgment, no qualifications were applied to the data.
- 1,2,3-Trichlorobenzene and 1,2-dibromo-3-chloropropane in the CCV in batch 253882 had %Ds that were high and outside the method specified acceptance criteria, with low biases. Since the %Ds of 1,2,3-trichlorobenzene and 1,2-dibromo-3-chloropropane were within the validation guidance acceptance criteria and based on professional and technical judgment, no qualifications were applied to the data.
- 2-Butanone, bromomethane, and chloroethane in the CCV in batch 253882 had %Ds that were high and outside the method specified acceptance criteria, with high biases. Since the %Ds of 2-butanone and chloroethane were within the validation guidance acceptance criteria, bromomethane was not detected in the associated sample, and based on professional and technical judgment, no qualifications were applied to the data.

1.2 Holding Times

The holding times for the VOC analysis of a preserved solid sample collected as a terracore are 48 hours until laboratory receipt and 14 days from sample collection to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batch 253609 and 253882). VOCs were not detected in the method blanks above the method detection limits (MDLs).

1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were not reported.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Trip Blank

One trip blank was shipped with the sample set, TRIP BLANK. VOCs were not detected in the trip blank above the MDLs.

1.9 Field Duplicate

Field duplicates were not collected with the sample set.

1.10 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were not reported.

The reporting limits (RLs) and MDLs met the RL and MDL criteria in QAPP Table 1.

1.11 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

2.0 SEMIVOLATILE ORGANIC COMPOUNDS

The samples were analyzed for SVOCs by EPA methods 3541/8270D.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

2.1 Overall Assessment

The SVOC data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for these analyses, for this sample set is 100%.

The narrative indicated the following issue with the %Ds in one CCV standard:

- 2-Nitroaniline and 4-nitrophenol in the CCV in batch 254117 had a %D that were high and outside the method specified acceptance criteria, with high biases. Since 2-nitroaniline and 4-nitrophenol were not detected in the associated sample, no qualifications were applied to the data.

2.2 Holding Times

The holding times for SVOC analysis of solid samples are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 254009). SVOCs were not detected in the method blank above the MDLs.

2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair was reported, using sample SD-02.

Based on the level the MS/MSD pair was diluted and professional and technical judgment, no qualifications were applied based on the MS/MSD results.

2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

2.6 Surrogates

The surrogates were not recovered (0% recovery) in sample SD-02 and the MS/MSD pair using sample SD-02. However, based on the level the samples and surrogates were diluted and professional and technical judgment, no qualifications were applied based on the surrogate recoveries.

2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

2.8 Field Duplicate

Field duplicates were not collected with the sample set.

2.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were reported due to the dilution analyzed. The RLs and MDLs met the RL and MDL criteria in QAPP Table 1.

2.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

3.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

3.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the %Ds for the CCVs:

- Two PCB 1254 peak %Ds were outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254176 (CCV 180-254176/1). Since PCB 1254 was reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.

- One PCB 1248 peak %D was outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254176 (CCV 180-254176/4). Since this peak was not used for sample quantitation, no qualifications were applied to the data.
- One PCB 1016 peak %D was outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254176 (CCV 180-254176/28). Since the bias was high and PCB 1016 was not detected in the associated samples, no qualifications were applied to the data.
- Two PCB 1254 peak %Ds were outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254345 (CCV 180-254345/1). Since these peaks were not used for sample quantitation, no qualifications were applied to the data.
- PCB 1016 %Ds were outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254345 (CCV 180-254345/5). Since the bias was high and PCB 1016 was not detected in the associated samples, no qualifications were applied to the data.
- One PCB 1260 peak %D was outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 254345 (CCV 180-254345/5). Since this peak was not used for sample quantitation, no qualifications were applied to the data.

3.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 253991). PCBs were not detected in the method blank above the MDLs.

3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

3.6 Surrogates

Acceptable surrogate recoveries were reported, with the following exceptions.

The tetrachloro-m-xylene recovery on GC column CLP in sample W10-2 was high and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

3.8 Field Duplicate

Field duplicates were not collected with the sample set.

3.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were not reported.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram
NR-not reported

3.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 21 December 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-81229-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of five solid samples and one field duplicate sample, collected August 23, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Toxicity Characteristic Leaching Procedure (TCLP) Lead by EPA Methods 3050B/6010C
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Inorganic Methods Data Review, January 2017 (EPA 540-R-2017-001), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-81229-1	TSCAPAD-01-20180823
180-81229-2	TSCAPAD-02-20180823
180-81229-3	ULC-01-20180823

Laboratory ID	Client ID
180-81229-4	MSA-01-20180823
180-81229-5	CP-01-20180823
180-81229-6	DUP-01-20180823

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issues were noted with the chain of custody (COC) forms:

- No collection times were documented on the COCs for the field duplicate sample. The laboratory assigned collection times of 00:00.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- Two PCB 1248 peak %Ds were outside the method specified acceptance criteria on GC column CLP1 in a CCV in batch 255305 (CCV 180-255305/4). Since PCB 1248 was reported from the other GC column, which had acceptable %Ds, no qualifications were applied to the data.
- One PCB 1016 peak %D was outside the method specified acceptance criteria on both GC columns in a CCV in batch 255305 (CCV 180-255305/5). Since the bias was high and PCB 1016 was not detected in the associated samples, no qualifications were applied to the data.
- One PCB 1260 peak %D was outside the method specified acceptance criteria on both GC columns in a CCV in batch 255305 (CCV 180-255305/5). Since this peak was not used for sample quantitation, no qualifications were applied to the data.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
TSCAPAD-01-20180823	PCB-1248	730	NA	730	J	13
TSCAPAD-01-20180823	PCB-1254	260	NA	260	J	13
TSCAPAD-01-20180823	PCB-1260	45	NA	45	J	13
TSCAPAD-02-20180823	PCB-1248	180	NA	180	J	13
TSCAPAD-02-20180823	PCB-1254	90	NA	90	J	13
TSCAPAD-02-20180823	PCB-1260	21	NA	21	J	13
ULC-01-20180823	PCB-1248	9400	NA	9400	J	13
ULC-01-20180823	PCB-1254	3400	NA	3400	J	13
ULC-01-20180823	PCB-1260	630	NA	630	J	13
MSA-01-20180823	PCB-1248	5400	NA	5400	J	13
MSA-01-20180823	PCB-1254	2200	NA	2200	J	13
MSA-01-20180823	PCB-1260	460	NA	460	J	13
CP-01-20180823	PCB-1248	1000	NA	1000	J	13
CP-01-20180823	PCB-1254	370	NA	370	J	13

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
CP-01-20180823	PCB-1260	74	NA	74	J	13
DUP-01-20180823	PCB-1248	11000	NA	11000	J	13
DUP-01-20180823	PCB-1254	3000	NA	3000	J	13
DUP-01-20180823	PCB-1260	660	NA	660	J	13

µg/kg-microgram per kilogram

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 255160). PCBs were not detected in the method blank above the method detection limits (MDLs).

1.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Field Duplicate

One field duplicate sample, DUP-01-20180823, was collected with the sample set. Acceptable precision [RPD <50% for results greater than five times the RL] was demonstrated between the field duplicate and the original sample, ULC-01-20180823.

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilutions analyzed.

The reporting limits (RLs) and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

2.0 **TCLP LEAD**

The samples were analyzed for TCLP by EPA methods 1311/3010A/6010C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

2.1 Overall Assessment

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for this analysis, for this sample set is 100%.

Method(s) 6010C: The serial dilution percent difference of sample SSHS-B1254-SUB-12-14 (180-81229-22) was above the control limits for iron.

The narrative noted that the reporting limit standard for analysis batch 253703 had a recovery for arsenic that was high and outside the laboratory specified acceptance criteria, 132%, limits 70-130%. Since the associated sample results were greater than the RL and based on professional and technical judgment, no qualifications were applied to the data.

2.2 Holding Times

The holding time for metals analysis of solid samples is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks (batches 255413 and 255464) and one leachate blank (batch 255247) were reported. The metals were not detected in the method and leachate blanks above the MDL.

2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS and one LCS/LCS duplicate (LCSD) pair were reported. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria.

2.6 Laboratory Duplicate

A laboratory duplicate was not reported with the sample set.

2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

2.8 Field Duplicate

One field duplicate sample, DUP-01-20180823, was collected with the sample set. Acceptable precision [RPD <50% for results greater than five times the RL] was demonstrated between the field duplicate and the original sample, ULC-01-20180823.

2.9 Sensitivity

The samples were reported to the MDL. No elevated non-detect results were reported.

RL and MDL criteria was not listed for TCLP lead in QAPP Table 1.

2.10 Electronic Data Deliverable Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 30 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 180-81404-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of three solid samples, collected August 29, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Pittsburgh, Pennsylvania. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
180-81404-1	UTP-01

Laboratory ID	Client ID
180-81404-2	UTP-02

Laboratory ID	Client ID
180-81404-3	UTP-03

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
UTP-01	PCB-1248	64000	NA	64000	J	13
UTP-01	PCB-1254	25000	NA	25000	J	13
UTP-01	PCB-1260	2500	NA	2500	J	13
UTP-02	PCB-1248	22000	NA	22000	J	13
UTP-02	PCB-1254	11000	NA	11000	J	13
UTP-02	PCB-1260	1000	NA	1000	J	13
UTP-03	PCB-1248	390	NA	390	J	13
UTP-03	PCB-1254	180	NA	180	J	13
UTP-03	PCB-1260	20	NA	20	J	13

µg/kg-microgram per kilogram

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 **Holding Times**

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 **Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 256125). PCBs were not detected in the method blank above the method detection limits (MDLs).

1.4 **Matrix Spike/Matrix Spike Duplicate (MS/MSD)**

MS/MSD pairs were not reported.

1.5 **Laboratory Control Sample (LCS)**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 **Surrogates**

Acceptable surrogate recoveries were reported.

1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

1.8 Field Duplicate

Field duplicates were not collected with the sample set.

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilutions analyzed.

The reporting limits (RLs) and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	5.4
Aroclor-1221	0.833	0.539	17	11
Aroclor-1232	0.833	0.494	17	9.9
Aroclor-1242	0.833	0.499	17	10
Aroclor-1248	0.833	0.659	17	13
Aroclor-1254	0.833	0.569	17	11
Aroclor-1260	0.833	0.237	17	4.7
Aroclor-1262	0.833	0.585	17	12
Aroclor-1268	0.833	0.405	17	8.1
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 27 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 200-44046-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of six solid samples and one equipment blank, collected June 24-25, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Burlington, Vermont. The samples were analyzed for the following tests:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3510C/8082A and 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives.

The remaining qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
200-44046-1	SSHS-B1193-SUB-0-2
200-44046-2	SSHS-B1070-SUB-0-2
200-44046-3	SSHS-B1073-SUB-2-4
200-44046-4	SSHS-B1068-SUB-0.2

Laboratory ID	Client ID
200-44046-5	SSHS-B1189-SUB-4-6
200-44046-6	SSHS-B1227-SUB-2-4
200-44046-7	EB-2

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issue was noted with the chain of custody (COC) forms:

- Incorrect error corrections were observed on the COC, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3510C/8082A and 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ⊗ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid

analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- The PCB 1260 %D in a CCV in batch 131402 (CCV 200-131402/29) was outside the method specified acceptance criteria on gas chromatography (GC) column CLP2. Since the results for PCB 1260 in the associated samples were reported from the other GC column, which had an acceptable %D, no qualifications were applied to the data.
- Chromatographic interference was present for decachlorobiphenyl, a component of Aroclor 1248, that adversely impacted the identification and quantitation in CCVs in batch 131325 and 131402 (CCV 200-131325/22 and CCV 200-131402/8). Since these were QC samples, no qualifications were applied to the data, based on professional and technical judgment.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1193-SUB-0-2	PCB-1248	440	NA	440	J	13
SSHS-B1193-SUB-0-2	PCB-1254	190	NA	190	J	13
SSHS-B1193-SUB-0-2	PCB-1260	24	J	24	J	13
SSHS-B1070-SUB-0-2	PCB-1248	1400	NA	1400	J	13
SSHS-B1070-SUB-0-2	PCB-1254	590	NA	590	J	13
SSHS-B1070-SUB-0-2	PCB-1260	100	J	100	J	13
SSHS-B1073-SUB-2-4	PCB-1248	610	NA	610	J	13
SSHS-B1073-SUB-2-4	PCB-1254	330	NA	330	J	13
SSHS-B1073-SUB-2-4	PCB-1260	55	J	55	J	13
SSHS-B1068-SUB-0.2	PCB-1248	65000	NA	65000	J	13
SSHS-B1068-SUB-0.2	PCB-1254	22000	NA	22000	J	13
SSHS-B1068-SUB-0.2	PCB-1260	2900	J	2900	J	13
SSHS-B1189-SUB-4-6	PCB-1248	610	NA	610	J	13
SSHS-B1189-SUB-4-6	PCB-1254	1200	NA	1200	J	13
SSHS-B1189-SUB-4-6	PCB-1260	150	J	150	J	13

µg/kg-microgram per kilogram

J-the result is less than the RL but greater than the method detection limit (MDL) and the concentration is an approximate value

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times for the PCB analysis of waters are 7 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 131241 and 131267). PCBs were not detected in the method blanks above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

One sample set specific MS/MSD pair was reported, using sample SSHS-B1194-SUB-0-2. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria, with the following exceptions.

The PCB 1016 recoveries were high and outside the laboratory specified acceptance criteria in the MS/MSD pair. Since PCB 1016 was not detected in this sample, no qualifications were applied to the data.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCS/LCS duplicate (LCSD) pairs were reported. The recovery and RPD results were within the laboratory specified acceptance criteria, with the following exceptions.

The PCB 1016 and PCB 1260 recoveries were low and outside the laboratory specified acceptance criteria in the LCSD in batch 131267. Therefore, the nondetect PCB results were UJ qualified as estimated less than the MDLs and the PCB concentrations were J qualified as estimated in the associated samples.

Former Sperry Remington Site-North

27 November 2018

Page 5

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier	Reason Code
SSHS-B1068-SUB-0.2	PCB-1016	1700	U	1700	UJ	5
SSHS-B1068-SUB-0.2	PCB-1221	1700	U	1700	UJ	5
SSHS-B1068-SUB-0.2	PCB-1232	1700	U	1700	UJ	5
SSHS-B1068-SUB-0.2	PCB-1242	1700	U	1700	UJ	5
SSHS-B1068-SUB-0.2	PCB-1248	65000	NA	65000	J	5
SSHS-B1068-SUB-0.2	PCB-1254	22000	NA	22000	J	5
SSHS-B1068-SUB-0.2	PCB-1260	2900	J	2900	J	5
SSHS-B1068-SUB-0.2	PCB-1262	1700	U	1700	UJ	5
SSHS-B1068-SUB-0.2	PCB-1268	1700	U	1700	UJ	5
SSHS-B1070-SUB-0.2	PCB-1016	29	U	29	UJ	5
SSHS-B1070-SUB-0.2	PCB-1221	29	U	29	UJ	5
SSHS-B1070-SUB-0.2	PCB-1232	29	U	29	UJ	5
SSHS-B1070-SUB-0.2	PCB-1242	29	U	29	UJ	5
SSHS-B1070-SUB-0.2	PCB-1248	1400	NA	1400	J	5
SSHS-B1070-SUB-0.2	PCB-1254	590	NA	590	J	5
SSHS-B1070-SUB-0.2	PCB-1260	100	J	100	J	5
SSHS-B1070-SUB-0.2	PCB-1262	29	U	29	UJ	5
SSHS-B1070-SUB-0.2	PCB-1268	29	U	29	UJ	5
SSHS-B1073-SUB-2.4	PCB-1016	13	U	13	UJ	5
SSHS-B1073-SUB-2.4	PCB-1221	13	U	13	UJ	5
SSHS-B1073-SUB-2.4	PCB-1232	13	U	13	UJ	5
SSHS-B1073-SUB-2.4	PCB-1242	13	U	13	UJ	5
SSHS-B1073-SUB-2.4	PCB-1248	610	NA	610	J	5
SSHS-B1073-SUB-2.4	PCB-1254	330	NA	330	J	5
SSHS-B1073-SUB-2.4	PCB-1260	55	J	55	J	5
SSHS-B1073-SUB-2.4	PCB-1262	13	U	13	UJ	5
SSHS-B1073-SUB-2.4	PCB-1268	13	U	13	UJ	5
SSHS-B1189-SUB-4.6	PCB-1016	30	U	30	UJ	5
SSHS-B1189-SUB-4.6	PCB-1221	30	U	30	UJ	5
SSHS-B1189-SUB-4.6	PCB-1232	30	U	30	UJ	5
SSHS-B1189-SUB-4.6	PCB-1242	30	U	30	UJ	5
SSHS-B1189-SUB-4.6	PCB-1248	610	NA	610	J	5
SSHS-B1189-SUB-4.6	PCB-1254	1200	NA	1200	J	5
SSHS-B1189-SUB-4.6	PCB-1260	150	J	150	J	5
SSHS-B1189-SUB-4.6	PCB-1262	30	U	30	UJ	5
SSHS-B1189-SUB-4.6	PCB-1268	30	U	30	UJ	5
SSHS-B1193-SUB-0.2	PCB-1016	12	U	12	UJ	5
SSHS-B1193-SUB-0.2	PCB-1221	12	U	12	UJ	5
SSHS-B1193-SUB-0.2	PCB-1232	12	U	12	UJ	5
SSHS-B1193-SUB-0.2	PCB-1242	12	U	12	UJ	5

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier	Reason Code
SSHS-B1193-SUB-0-2	PCB-1248	440	NA	440	J	5
SSHS-B1193-SUB-0-2	PCB-1254	190	NA	190	J	5
SSHS-B1193-SUB-0-2	PCB-1260	24	J	24	J	5
SSHS-B1193-SUB-0-2	PCB-1262	12	U	12	UJ	5
SSHS-B1193-SUB-0-2	PCB-1268	12	U	12	UJ	5
SSHS-B1227-SUB-2-4	PCB-1016	3.2	U	3.2	UJ	5
SSHS-B1227-SUB-2-4	PCB-1221	3.2	U	3.2	UJ	5
SSHS-B1227-SUB-2-4	PCB-1232	3.2	U	3.2	UJ	5
SSHS-B1227-SUB-2-4	PCB-1242	3.2	U	3.2	UJ	5
SSHS-B1227-SUB-2-4	PCB-1248	52	NA	52	J	5
SSHS-B1227-SUB-2-4	PCB-1254	3.2	U	3.2	UJ	5
SSHS-B1227-SUB-2-4	PCB-1260	3.2	U	3.2	UJ	5
SSHS-B1227-SUB-2-4	PCB-1262	3.2	U	3.2	UJ	5
SSHS-B1227-SUB-2-4	PCB-1268	3.2	U	3.2	UJ	5

µg/kg-microgram per kilogram

J-the result is less than the RL but greater than the method detection limit (MDL) and the concentration is an approximate value

U-not detected at or above the MDL

NA-not applicable

1.6 Surrogates

Acceptable surrogate recoveries were reported, with the following exceptions.

The decachlorobiphenyl recoveries on both GC columns in sample SSHS-B1227-SUB-2-4 were low and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

The decachlorobiphenyl recovery on GC column CLP2 in sample SSHS-B1068-SUB-0.2 was high and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

1.7 Equipment Blank

An equipment blank was collected with the sample set, EB-2. PCBs were not detected in the equipment blank above the MDLs.

1.8 Field Duplicate

Field duplicates were not collected with the sample set.

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilutions analyzed.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	2.8
Aroclor-1221	0.833	0.539	17	2.8
Aroclor-1232	0.833	0.494	17	2.8
Aroclor-1242	0.833	0.499	17	2.8
Aroclor-1248	0.833	0.659	17	2.8
Aroclor-1254	0.833	0.569	17	2.8
Aroclor-1260	0.833	0.237	17	2.8
Aroclor-1262	0.833	0.585	17	2.8
Aroclor-1268	0.833	0.405	17	2.8
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 20 December 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 200-44046-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of four solid samples, one field duplicate sample and one equipment blank, collected June 26, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Burlington, Vermont. The samples were analyzed for the following test:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3510C/8082A and 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
200-44065-1	SSHS-B1195-SUB-0-2
200-44065-2	SSHS-B1069-SUB-0-2
200-44065-3	SSHS-B1192-SUB-0-2

Laboratory ID	Client ID
200-44065-4	SSHS-B1067-SUB-0-2
200-44065-5	FD-3
200-44065-6	EB-3

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The following issues were noted with the chain of custody (COC) form:

- Incorrect error corrections were observed on the COC, instead of the proper procedure of a single strike through, correction, and initials and date of person making the corrections.
- Sample dates were not listed for samples SSHS-B1069-SUB-0-2, SSHS-B1192-SUB-0-2, SSHS-B1067-SUB-0-2 and FD-3. The samples were logged on with the sample date 06/26/18.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3510C/8082A and 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issue with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- Chromatographic interference was present for decachlorobiphenyl, a component of Aroclor 1248, that adversely impacted the identification and quantitation in CCVs in batch 131325 and 131402 (CCV 200-131325/22 and CCV 200-131402/8). Since these were QC samples, no qualifications were applied to the data, based on professional and technical judgment.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1195-SUB-0-2	PCB-1248	26000	NA	26000	J	13
SSHS-B1195-SUB-0-2	PCB-1254	9500	NA	9500	J	13
SSHS-B1195-SUB-0-2	PCB-1260	1700	J	1700	J	13
SSHS-B1069-SUB-0-2	PCB-1248	18	NA	18	J	13
SSHS-B1069-SUB-0-2	PCB-1254	8.6	J	8.6	J	13
SSHS-B1192-SUB-0-2	PCB-1248	2600	NA	2600	J	13
SSHS-B1192-SUB-0-2	PCB-1254	960	NA	960	J	13
SSHS-B1192-SUB-0-2	PCB-1260	160	J	160	J	13
SSHS-B1067-SUB-0-2	PCB-1248	650	NA	650	J	13
SSHS-B1067-SUB-0-2	PCB-1254	380	NA	380	J	13
SSHS-B1067-SUB-0-2	PCB-1260	78	J	78	J	13
FD-3	PCB-1248	610	NA	610	J	13
FD-3	PCB-1254	350	NA	350	J	13
FD-3	PCB-1260	72	J	72	J	13

µg/kg-microgram per kilogram

J-the result is less than the reporting limit (RL) but greater than the method detection limit (MDL) and the concentration is an approximate value

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times for the PCB analysis of water are 7 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 131241 and 131301). PCBs were not detected in the method blanks above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS and one LCS/LCS duplicate (LCSD) pair were reported. The recovery and RPD results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported, with the following exceptions.

The decachlorobiphenyl recovery on GC column CLP2 in sample SSHS-B1195-SUB-0-2 was high and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

The decachlorobiphenyl recoveries on both GC columns in sample EB-3 were low and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

1.7 Equipment Blank

An equipment blank was collected with the sample set, EB-3. PCBs were not detected in the equipment blank above the MDLs.

1.8 Field Duplicate

One field duplicate, FD-3, was collected with the sample set. Acceptable precision [RPD <50% for results greater than five times the RL] was demonstrated between the field duplicate and the original sample SSHS-B1067-SUB-0-2.

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilutions analyzed.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	2.8
Aroclor-1221	0.833	0.539	17	2.8
Aroclor-1232	0.833	0.494	17	2.8
Aroclor-1242	0.833	0.499	17	2.8
Aroclor-1248	0.833	0.659	17	2.8
Aroclor-1254	0.833	0.569	17	2.8
Aroclor-1260	0.833	0.237	17	2.8
Aroclor-1262	0.833	0.585	17	2.8
Aroclor-1268	0.833	0.405	17	2.8
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram
NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference

Memorandum

Date: 28 November 2018
To: Aron Krasnopoler
From: Kristoffer Henderson
CC: J. Caprio
Subject: **Stage 2A Data Validation - Level II Data Deliverable, TestAmerica
Job ID 200-44116-1**

SITE: Former Sperry Remington Site-North

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of four solid samples including one sample for matrix spike/matrix spike duplicate (MS/MSD) pair analyses and two equipment blanks, collected June 26-27, 2018, as part of the Former Sperry Remington Site-North project. The analyses were performed at TestAmerica Laboratories, Inc., Burlington, Vermont. The samples were analyzed for the following test:

- Polychlorinated Biphenyls (PCBs) by EPA Methods 3510C/8082A and 3541/8082A
- Total Solids by Standard Method 2540G

EXECUTIVE SUMMARY

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualifications.

The data were validated using the Quality Assurance Project Plan (QAPP)/Field Sampling Plan (FSP), Former Sperry Remington Site– North Portion, Agency Review Draft, September 2018, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2017 (EPA 540-R-2017-002), the pertinent methods referenced by the laboratory report and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
200-44116-1	EB-4
200-44116-2	SSHS-B1065-SUB-0-2
200-44116-2 MS	SSHS-B1065-SUB-0-2 MS
200-44116-2 MSD	SSHS-B1065-SUB-0-2 MSD

Laboratory ID	Client ID
200-44116-3	SSHS-B1188-SUB-0-2
200-44116-4	SSHS-B1066-SUB-0-2
200-44116-5	SSHS-B1212-SUB-4-6
200-44116-6	EB-5

The samples were received at the laboratory within the criteria of $\leq 6^{\circ}\text{C}$. No sample preservation issues were noted by the laboratory.

The solids data, used to report the samples on a dry weight basis, were not validated.

1.0 POLYCHLORINATED BIPHENYLS

The samples were analyzed for PCBs by EPA Methods 3510C/8082A and 3541/8082A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised over the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate
- ⊗ Sensitivity
- ✓ Electronic Data Deliverable Review

1.1 Overall Assessment

The PCB data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for this sample set is 100%.

The narrative indicated the following issues with the percent differences (%Ds) for the continuing calibration verifications (CCVs):

- Chromatographic interference was present for decachlorobiphenyl, a component of Aroclor 1248, that adversely impacted the identification and quantitation in CCVs in batch 131402 and 131506 (CCV 200-131402/8 and CCV 200-131506/9). Since these were QC samples, no qualifications were applied to the data, based on professional and technical judgment.

The samples contain mixtures of PCBs 1248, 1254 and 1260. There are peaks in 1248 and 1254 that are in both of these PCBs and peaks in 1254 and 1260 that are in both of these PCBs; therefore, there is contribution between PCBs when more than one PCB is detected in a sample. Therefore, based on professional and technical judgment, the concentrations of PCBs 1248, 1254 and 1260 in these samples were J qualified as estimated.

Sample	Analyte	Laboratory Result (µg/kg)	Laboratory Flag	Validation Result (µg/kg)	Validation Qualifier*	Reason Code**
SSHS-B1065-SUB-0-2	PCB-1248	110	NA	110	J	13
SSHS-B1065-SUB-0-2	PCB-1254	70	NA	70	J	13
SSHS-B1065-SUB-0-2	PCB-1260	40	NA	40	J	13
SSHS-B1188-SUB-0-2	PCB-1248	79	NA	79	J	13
SSHS-B1188-SUB-0-2	PCB-1254	50	NA	50	J	13
SSHS-B1188-SUB-0-2	PCB-1260	15	J	15	J	13
SSHS-B1066-SUB-0-2	PCB-1248	4500	NA	4500	J	13
SSHS-B1066-SUB-0-2	PCB-1254	2400	NA	2400	J	13
SSHS-B1066-SUB-0-2	PCB-1260	510	J	510	J	13

µg/kg-microgram per kilogram

J-the result is less than the reporting limit (RL) but greater than the method detection limit (MDL) and the concentration is an approximate value

NA-not applicable

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.2 Holding Times

The holding times for the PCB analysis of solids are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times for the PCB analysis of water are 7 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 131351 and 131405). PCBs were not detected in the method blanks above the MDLs.

1.4 Matrix Spike/Matrix Spike Duplicate

One MS/MSD pair was reported using sample SSHS-B1065-SUB-0-2. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria.

1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS and one LCS/LCS duplicate (LCSD) pair were reported. The recovery and RPD results were within the laboratory specified acceptance criteria.

1.6 Surrogates

Acceptable surrogate recoveries were reported, with the following exceptions.

The decachlorobiphenyl recovery on gas chromatography (GC) column CLP2 in sample SSHS-B1212-SUB-4-6 was high and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

The decachlorobiphenyl recoveries on both GC columns in samples EB-4, SSHS-B1188-SUB-0-2 and EB-5 were low and outside the laboratory specified acceptance criteria. Since the other surrogate had acceptable recoveries and based on professional and technical judgment, no qualifications were applied to the data.

1.7 Equipment Blank

Two equipment blanks were collected with the sample set, EB-4 and EB-5. PCBs were not detected in the equipment blanks above the MDLs.

1.8 Field Duplicate

Field duplicates were not collected with the sample set.

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilutions analyzed.

The RLs and MDLs did not meet the RL and MDL criteria in QAPP Table 1 for the following analytes.

Analyte	QAPP Specified RL (µg/kg)	QAPP Specified MDL (µg/kg)	Laboratory RL (µg/kg)	Laboratory MDL (µg/kg)
Aroclor-1016	0.833	0.271	17	2.8
Aroclor-1221	0.833	0.539	17	2.8
Aroclor-1232	0.833	0.494	17	2.8
Aroclor-1242	0.833	0.499	17	2.8
Aroclor-1248	0.833	0.659	17	2.8
Aroclor-1254	0.833	0.569	17	2.8
Aroclor-1260	0.833	0.237	17	2.8
Aroclor-1262	0.833	0.585	17	2.8
Aroclor-1268	0.833	0.405	17	2.8
Polychlorinated Biphenyls, Total	0.833	0.183	NR	NR

µg/kg-microgram per kilogram

NR-not reported

1.10 Electronic Data Deliverable (EDD) Review

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The sample receipt time was included in the sample IDs in the EDD and was not included in the laboratory report. No other discrepancies were identified between the level II report and the EDD.

* * * * *

ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS
AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team

DATA QUALIFIER DEFINITIONS

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit. Upon application of the U qualifier to a reported result, the definition changes to “not detected at or above the reported result”.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team

Valid Value	Description
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS recovery outside limits
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

RPD-relative percent difference