# SDG NARRATIVE

**LAB NAME: Alliance Technical Group, LLC**
**CASE: 51804**
**SDG: XA100**
**CONTRACT: 68HERH20D0011**
**LAB CODE: ACE**
**LAB ORDER ID: P4476**
**MODIFICATION REF. NUMBER: NA**

| Sample ID | EPA Sample ID | Test | pH |
|---|---|---|---|
| P4476-01 | XA100 | | |
| P4476-01DL | XA100DL | Arolclor | |
| P4476-02 | XA101 | | |
| P4476-02DL | XA101DL | SVOA_SIM | |
| P4476-02DL2 | XA101DL2 | SVOA_SIM | |
| P4476-03 | XA102 | | |
| P4476-03DL | XA102DL | PEST | |
| P4476-03DL2 | XA102DL2 | PEST | |
| P4476-04 | XA103 | | |
| P4476-04DL | XA103DL | SVOA | |
| P4476-05 | XA104 | | |
| P4476-06 | XA105 | | |
| P4476-07 | XA106 | | |
| P4476-07DL | XA106DL | SVOA_SIM | |
| P4476-07DL2 | XA106DL2 | SVOA_SIM | |
| P4476-08 | XA107 | | |
| P4476-08DL | XA107DL | PEST | |
| P4476-08DL2 | XA107DL2 | PEST | |
| P4476-09 | XA108 | | |
| P4476-09DL | XA108DL | SVOA | |
| P4476-10 | XA109 | | |
| P4476-11 | XA110 | | |

05 Soil samples were delivered to the laboratory intact on 10/22/2024.
06 Water samples were delivered to the laboratory intact on 10/22/2024.

Test requested on the Chain of Custody was Trace Volatile Organic, Trace Volatile Organic-SIM, Volatile Organic, Semi volatile Organic, Semi volatile Organic-SIM, Pesticide, and Aroclor by Method SFAM01.1.

The temperature of the samples was measured using an I R Gun. The samples temperature was 15.2 degree Celsius for the samples received on 10/22/2024.

**Trace Volatiles:**

The analysis performed on instrument MSVOA_V were done using GC column DB-624UI 20m 0.18mm 1.0 um. Cat#121-1324UI.

The analysis of VOC-SFAM was based on method SFAM01.1_Trace.

The Surrogate recoveries met the acceptable criteria.
The Internal Standards Areas met the acceptable requirements.
Instrument Performance Check met requirements.
The Retention Times met requirements.
The Tuning criteria met requirements.
The initial Calibration criteria met requirements.
The Continuing criteria met requirements.
The Blank analysis did not indicate the presence of lab contamination.

See **Manual Integration report** for the manual integration information at the end of the case narrative.

**Calculation:**

**Low/Med Water Level Calculation**

$$\text{Concentration in ug/L} = \frac{(Ax)\,(Is)\,(DF)}{(Ais)\,(RRF)\,(Vo)}$$

Where,
Ax = Area of the characteristic ion (EICP) for the compound to be measured.
Ais = Area of the characteristic ion (EICP) for the internal standard.
Amount of internal standard added in ng.
RRF = Mean Relative Response Factor from the initial calibration standard.
Vo = Total volume of water purged, in mL.
DF = Dilution Factor

Example calculation of **XA109** for **Vinyl chloride**:

Ax= 249996
Is = 125
RRF= 0.491
DF= 1
Ais= 318553

Vo. = 25

$$\text{Concentration in ug/L} = \frac{(249996)\,(125)\,(1)}{(318553)(0.491)(25)}$$

Reported Result = 7.99 ug/L

Final Reported Result = 8.0 ug/L

Relative Response Factor = **Dichlorodifluoromethane**: RUN **VV101624** for **0.5** ppb

$$\text{RRF} = \frac{\text{Area of compound}}{\text{Area of Internal Standard}} \times \frac{\text{Conc. of Internal Standard}}{\text{Conc. of Compound}}$$

$$\text{RRF} = \frac{15204}{286964} \times \frac{5.0}{0.5}$$

RRF= 0.530

**Trace Volatiles SIM:**

The analysis performed on instrument MSVOA_U were done using GC column DB-624UI 20m 0.18mm 1.0 um. Cat#121-1324UI.

The analysis of VOC-SIM was based on method SFAM01.1_VOCSIM .

The Surrogate recoveries met the acceptable criteria.
The Retention Times met requirements.
The Internal Standards Areas met the acceptable requirements.
Instrument Performance Check met requirements.
The Tuning criteria met requirements.
The Initial Calibration met requirements.
The Continuing Calibration met the requirements.
The Blank analysis did not indicate the presence of lab contamination.

See **Manual Integration report** for the manual integration information at the end of the case narrative.

**Calculation:**

$$\text{Concentration in ug/L} = \frac{(Ax)\,(Is)\,(DF)}{(Ais)\,(RRF)\,(Vo)}$$

Where,

Ax = Area of the characteristic ion (EICP) for the compound to be measured.
Ais = Area of the characteristic ion (EICP) for the internal standard.
Is = Amount of internal standard added in ng.
RRF = Mean Relative Response Factor from the initial calibration standard.
Vo = Total volume of water purged, in mL.
DF = Dilution Factor.

Example Calculation for sample **XA110** for **1,2-Dibromoethane**:

Ax = 8514
Is = 12.5
RRF= 0.185
DF = 1
Ais = 35912
Vo. = 25

$$\text{Concentration in ug/L} = \frac{(8514)\ (12.5)\ (1)}{(35912)\ (0.185)\ (25)}$$

$$= 0.640 \text{ ug/L}$$

Reported Result = 0.64 ug/L

Relative Response Factor = **Vinyl chloride**: RUN **VU102224** for **0.05** ppb

$$\text{RRF} = \frac{\text{Area of compound}}{\text{Area of Internal Standard}} \text{ X } \frac{\text{Conc. of Internal Standard}}{\text{Conc. of Compound}}$$

$$\text{RRF} = \frac{1385}{27950} \text{ X } \frac{0.5}{0.05}$$

RRF= 0.496

**Low Volatiles:**

The analysis performed on instrument MSVOA_W were done using GC column RXI-624SIL MS 30m 0.18mm 1.4 um. Cat#13868.

The analysis of VOC-SFAM was based on method SFAM01.1_LOW.

The Surrogate recoveries met the acceptable criteria.
The Internal Standards Areas met the acceptable requirements.
Instrument Performance Check met requirements.
The Retention Times were met for all samples.
The Tuning criteria met requirements.

The Initial Calibration met the requirements.
The Continuing Calibration met the requirements.
The blank analysis did not indicate the presence of lab contamination.

**Manual Integration report f**or the manual integration information at the end of the case narrative.

**Calculation:**

**Low/Med Level Soil/Sediment Calculation**

Concentration in ug/Kg dry Weight basis) = $\frac{(Ax)(Is)(Df)}{(Ais)(RRF)(Ws)(D)}$

Where,
Ax = Area for the compound to be measured
Ais = Area for the specific internal standard
Is = Amount of internal standard added in Nano grams (ng)
RRF = Relative response factor of the calibration standard.
Df = Dilution factor
Ws= Weight of sample

$$D= \frac{100 \quad - \quad \%moisture}{100}$$

Example Calculation for sample: **XA104** for **1,1-Dichloroethene**:

Ax= 164200
Is= 250
RRF= 0.335
DF=1
Ais= 296210
Ws= 5.00
D= 1

Concentration in ug/KG = $\frac{(164200)\ (250)\ (1)}{(296210)\ (0.335)\ (5.00)\ (1)}$

= 82.74 ug//Kg

Final Reported Results = 83 ug/Kg

Relative Response Factor = **Dichlorodifluoromethane**: RUN **VW100924** for **2.5** ppb

$$RRF= \frac{\text{Area of compound}}{\text{Area of Internal Standard}} \quad X \quad \frac{\text{Conc. of Internal Standard}}{\text{Conc. of Compound}}$$

$$RRF = \frac{11869}{356470} \times \frac{25}{2.5}$$

RRF= 0.333

**Semivolatiles:**

The samples were analyzed on instrument BNA_M using GC Column ZB-GR Semi Volatiles Guardian which is 30 meters, 0.25 mm ID, 0.5 um df, Catalog # 7HG-G027-17-GGA.

The samples were analyzed on instrument BNA_P using GC Column ZB-GR Semi Volatiles Guardian which is 30 meters, 0.25 mm ID, 0.5 um df, Catalog # 7HG-G027-17-GGA.

Semis volatile Organic for water sample was extracted by Method SFAM01.1 on 10/24/2024 for soil sample was extracted by Method SFAM01.1 on 10/23/2024, The analysis of SVO-SFAM was based on method SFAM01.1_SVOC.

The Holding Times were met for all analysis.
The Surrogate recoveries met the acceptable criteria.
The Internal Standards Areas met the acceptable requirements.
The Retention Times were acceptable for all samples.
The Blank Spike for {PB164352BS} recoveries met the requirements for all compounds.
The Blank Spike for {PB164417BS} recoveries met the requirements for all compounds.
The Blank analysis did not indicate the presence of lab contamination.
The Tuning criteria met the requirements.
The Initial Calibration met the requirements.
The Continuous Calibration met the requirements.

Samples XA103, XA108 were diluted due to high concentrations.

**Concentration of Water Sample:**

$$\text{Concentration ug/L} = \frac{(Ax)\,(Is)\,(Vt)\,(DF)\,(GPC)}{(Ais)\,(\overline{RRF})\,(Vo)\,(Vi)}$$

Where,
Ax = Area of the characteristic ion for the compound to be measured.
Ais = Area of the characteristic ion for the internal standard.
Is = Amount of internal standard injected in ng.
Vo = Volume of water extracted in mL.
Vi = Volume of extract injected in uL.
Vt = Volume of the concentrated extract in uL
RRF = Mean Relative Response Factor determined from the initial calibration standard.
GPC = $\underline{Vin}$ = GPC factor (If no GPC is performed, GPC=1)

Vout = Volume of extract collected after GPC cleanup.

**Concentration of SOIL Sample:**

Concentration ug/Kg,

$$\text{(dry weight basis)} = \frac{(Ax)\,(Is)\,(Vt)\,(DF)\,(GPC)}{(Ais)\,(RRF)\,(Vi)\,(Wt)\,(D)}$$

Where,
Ax = Area of the characteristic ion for the compound to be measured.
Ais = Area of the characteristic ion for the internal standard.
Is = Amount of internal standard injected in ng.
Vi = Volume of extract injected in microliters (uL)
Vt = Volume of concentrated extract in microliters (uL)
Wt = Weight of the original sample extracted in g
Df = Dilution factor
RRF = Mean Relative Response Factor determined from the initial calibration standard.
GPC = Vin = GPC factor (If no GPC is performed, GPC=1)
Vout = Volume of extract collected after GPC cleanup.

$$D = \frac{100 - \%\text{moisture}}{100}$$

**Example calculation of XA103 for Phenol:**

Ax = 726165
Ais = 97938
Is = 20
Vi = 1
Vt = 500
Wt = 30.1
Df = 1
RRF = 1.752
GPC = 2
D= 1

Concentration

$$\text{(dry weight basis) ug/Kg} = \frac{(726165)\,(20)\,(500)\,(1)\,(2)}{(97938)\,(1.752)\,(1)\,(30.1)\,(1)}$$

= 2800 ug/Kg

RRF Calculation of standard 20 ppb for Naphthalene with P instrument for method 10/07/2024.

RRF= Area of compound / X Conc. of Internal Standard /
Area of Internal Standard Conc. of Compound

= 326983/315808 X 20/20

= 1.035 (Reported RRF)

**Semivolatiles SIM:**

The samples were analyzed on instrument BNA_N using GC Column ZB-GR Semi Volatiles Guardian which is 30 meters, 0.25 mm ID, 0.5 um df, Catalog # 7HG-G027-17-GGA.

Semis volatile Organic sample for Water sample was extracted by Method SFAM01.1 on 10/24/2024 and for Soil sample was extracted by Method SFAM01.1 on 10/23/2024. The analysis of SVOC-SIM-SFAM was based on method SFAM01.1_SVOC.

The Holding Times were met for all analysis.
The Surrogate recoveries met the acceptable criteria.
The Internal Standards Areas met the acceptable requirements.
The Retention Times were acceptable for all samples.
The Blank Spike for {PB164351BS} recoveries met the requirements for all compounds.
The Blank Spike for {PB164418BS} recoveries met the requirements for all compounds.
The Blank analysis did not indicate the presence of lab contamination.
The Tuning criteria met requirements.
The Initial Calibration met requirements.
The Continuous Calibration met requirements.

Samples XA101, XA101DL, XA106 and XA106DL were diluted due to high concentrations.

See **Manual Integration report** for the manual integration information at the end of the case narrative.

**Concentration of Water Sample:**

$$\text{Concentration ug/L} = \frac{(Ax)\ (Is)\ (Vt)\ (DF)\ (GPC)}{(Ais)\ (\overline{RRF})\ (Vo)\ (Vi)}$$

Where,

Ax = Area of the characteristic ion for the compound to be measured.
Ais = Area of the characteristic ion for the internal standard.

Is = Amount of internal standard injected in ng.
Vo = Volume of water extracted in mL.
Vi = Volume of extract injected in uL.
Vt = Volume of the concentrated extract in uL
RRF = Mean Relative Response Factor determined from the initial calibration standard.
GPC = $\frac{\text{Vin}}{\text{Vout}}$ = GPC factor (If no GPC is performed, GPC=1)

**Concentration of SOIL Sample:**

Concentration ug/Kg,

$$\text{(dry weight basis)} = \frac{(\text{Ax})\ (\text{Is})\ (\text{Vt})\ (\text{DF})\ (\text{GPC})}{(\text{Ais})\ (\text{R}\overline{\text{R}}\text{F})\ \ (\text{Vi})\ (\text{Wt})\ (\text{D})}$$

Where,

Ax = Area of the characteristic ion for the compound to be measured.
Ais = Area of the characteristic ion for the internal standard.
Is = Amount of internal standard injected in ng.
Vi = Volume of extract injected in microliters (uL)
Vt = Volume of concentrated extract in microliters (uL)
Wt = Weight of the original sample extracted in g
Df = Dilution factor
RRF = Mean Relative Response Factor determined from the initial calibration standard.
GPC = $\frac{\text{Vin}}{\text{Vout}}$ = GPC factor (If no GPC is performed, GPC=1)
Vout = Volume of extract collected after GPC cleanup.
D= $\frac{100\ -\ \%\text{moisture}}{100}$

**Example calculation of XA101 for Pyrene:**

Ax = 200418
Ais = 19397
Is = 0.4
Vi = 1
Vt = 500
Wt = 30.1
Df = 1
RRF = 2.020
GPC = 2
D= 1

Concentration

$$\text{(dry weight basis) ug/Kg} = \frac{(200418)\ (0.4)\ \ (500)\ (1)\ \ (2)}{(19397)\ (2.020)\ (1)\ (30.1)\ (1)}$$

$$= 68\ \text{ ug/Kg}$$

RRF Calculation of standard 0.4 ppb for **Naphthalene** with N instrument for method 10/31/2024.

$$\text{RRF} = \frac{\text{Area of compound /}}{\text{Area of Internal Standard}} \quad \text{X} \quad \frac{\text{Conc. of Internal Standard /}}{\text{Conc. of Compound}}$$

= 23510/21819 X 0.4/0.4

= 1.078 (Reported RRF)

**Pesticides:**

The analyses for Pesticides were performed on instrument ECD_D. The front column is ZB-Multi-Residue-2 which is 30 meters, 0.32 mm ID, 0.2 um df. The rear column ZB-Multi-Residue-1 which is 30 meters, 0.32 mm ID, 0.50 um df.

The sample was analyzed on a single injection dual column system. To distinguish the second column analysis from the first column a -2 suffix was added to the file id on the form 1. These refer to forms were both columns are reported. Form 1s for the IBLK and PLCS are referenced as IBLK(1)/IBLK(2) and PLCS01(1) / PLCS01(2) respectively.

Pesticide sample was extracted by method SFAM01.1 on 10/23/2024 and analyzed on 10/28/2024. The sample was extracted and analyzed within contractual holding time.

The soil sample was subjected to Florisil and GPC Cleanup.

The Surrogate recoveries met the acceptable criteria except for
XA102DL2[Tetrachloro-m-xylene(1)-0%, Tetrachloro-m-xylene(2)-0%, Decachlorobiphenyl(1)-0%, Decachlorobiphenyl(1) - 0%],
XA107DL2[Tetrachloro-m-xylene(1)-0%, Tetrachloro-m-xylene(2)-0%, Decachlorobiphenyl(1)-0%, Decachlorobiphenyl(1) - 0%],
The SOW allows one surrogate to fail to meet the criteria per column. ((Please See Section 11.3.6 of Exhibit D Pesticide Analysis).

The Blank analysis did not indicate the presence of lab contamination.
Blank and Laboratory Control Sample met the requirements.
Retention Times met the requirements.

Florisil check met the requirements.
Resolution Check met the requirements.
The Retention Times were acceptable for all samples.
The Initial Calibration met the requirements.
The Individual Mix A met the requirements.
The Individual Mix B met the requirements.
The PEM met the requirement.

Samples XA102, XA102DL, XA107 and XA107DL were diluted due to high concentration.

Samples XA102, XA102DL, XA102DL2, XA107, XA107DL and XA107DL2 failed to meet the %D for the results between the two columns Criteria.

See **Manual Integration report** for the manual integration information at the end of the case narrative.

**Calculation for the Concentration in Water Samples**

$$\text{Concentration ug/L} = \frac{(Ax)\ (Vt)\ (DF)\ (GPC)}{(CF)\ (Vo)\ (Vi)}$$

Where,
Ax = Response (peak area or height) of the compound to be measured.
CF = Mean Calibration Factor from the initial calibration (area/ng).
Vo = Volume of water extracted in mL.
Vi = Volume of extract injected in uL.
Vt = Volume of the concentrated extract in uL

$$GPC = \frac{Vin}{Vout} = \text{GPC factor (If no GPC is performed, GPC=1)}$$

Vin = Volume of extract loaded onto GPC column.

Vout = Volume of extract collected after GPC cleanup.

**Calculation for the Concentration in Soil Samples**

$$\text{Concentration ug/Kg (Dry weight basis)} = \frac{(Ax)\ (Vt)\ (DF)\ (GPC)}{(CF)\ (Vi)\ (Ws)\ (D)}$$

Where,
Ax = Response (peak area or height) of the compound to be measured.
CF = Mean Calibration Factor from the initial calibration (area/ng).
Vt = Volume of the concentrated extract in uL

Vi = Volume of extract injected (uL). (If a single injection is made onto two columns, use ½ the volume in the syringe as the volume injected onto each column).
Ws = Weight of sample extracted (g).
D = % dry weight or $\frac{100 - \%\text{Moisture}}{100}$
GPC = $\frac{\text{Vin}}{\text{Vout}}$ = GPC factor (If no GPC is performed, GPC=1)

DF = Dilution Factor

**Example of Dieldrin calculation**

Calibration Factor Calculation Dieldrin in the second column

$$\text{Calibration factor (CF)} = \frac{\text{peak area}}{\text{Mass injected in ng}}$$

$$= \frac{127989053}{10\text{ng}}$$

$$= 12798900$$

Mean Calibration Factor = average of 5 point calibration factor

$$= 12337500$$

Sample **XA102**
Ax = 5406643881
CF = 12337500
Ws =30.1
Vi = 1.0
Vt = 5000
DF = 1.0
GPC = 2.0
D = 1.0

$$\text{Concentration ug/Kg (Dry weight basis)} = \frac{(\text{Ax})\ (\text{Vt})\ (\text{DF})\ (\text{GPC})}{(\text{CF})\ (\text{Vi})\ (\text{Ws})\ (\text{D})}$$

$$= \frac{(5406643881)\ (5000)\ (1.0)\ (2.0)}{(12337500)(1.0)(30.1)(1.0)}$$

$$= 145.59$$

Reported Results = 150 ug/kg

**Aroclors:**

The analyses were performed on instrument GC ECD_Q. The front column is ZB-MR1 which is 30 meters, 0.32 mm ID, 0.5 um df, Catalogue # 7HM-G016-17. The rear column is ZB-MR2 which is 30 meters, 0.32 mm ID, 0.25 µm; Catalogue # 7HM-G017-11.

The sample was analyzed on a single injection dual column system. To distinguish the second column analysis from the first column a -2 suffix was added to the file id on the form 1. These refer to forms were both columns are reported. Form 1s for the IBLK and ALCS are referenced as IBLK(1)/IBLK(2) and ALCS01(1)/ALCS01(2) respectively.

Aroclor sample was extracted by Method SFAM01.1 on 10/23/2024 analyzed on 05/24 and 10/24/2024, All the samples were subjected to a Sulfuric acid cleanup. The sample was extracted and analyzed within contractual holding time.

The Surrogate recoveries met the acceptable criteria.
The Laboratory Control Sample met requirements.
The Blank analysis did not indicate the presence of lab contamination.
The Initial Calibration met the requirements.
The Continuing Calibrations met the requirements.
The Retention Times were acceptable for all samples.

Samples XA100 was diluted due to high concentrations

See Manual Integration report for the manual integration information at the end of the Case narrative.

**Calculation for Concentration in Water Samples:**

$$\text{Concentration ug/L} = \frac{(Ax)\,(Vt)\,(DF)\,(GPC)}{(CF)\,(Vo)\,(Vi)}$$

Where,
Ax = Response (peak area or height) of the compound to be measured.
CF = Mean Calibration Factor from the initial calibration (area/ng).
Vo = Volume of water extracted in mL.
Vi = Volume of extract injected in uL.
Vt = Volume of the concentrated extract in uL
$GPC = \frac{Vin}{Vout}$ = GPC factor (If no GPC is performed, GPC=1)
Vin = Volume of extract loaded onto GPC column.
Vout = Volume of extract collected after GPC cleanup.
DF = Dilution Factor.

**Calculation for Concentration in Soil samples:**

$$\text{Concentration ug/Kg (Dry weight basis)} = \frac{(Ax)\ (Vt)\ (DF)\ (GPC)}{(CF)\ (Vi)\ (Ws)\ (D)}$$

Where,
Ax = Response (peak area or height) of the compound to be measured.
CF = Mean Calibration Factor from the initial calibration (area/ng).
Vt = Volume of the concentrated extract in uL
Vi = Volume of extract injected (uL). (If a single injection is made onto two columns, use ½ the volume in the syringe as the volume injected onto each column).
Ws = Weight of sample extracted (g).
D = % dry weight or $\frac{100 - \%\text{Moisture}}{100}$
GPC = $\frac{Vin}{Vout}$ = GPC factor (If no GPC is performed, GPC=1)
DF = Dilution Factor

**Example of AR1232 calculation for Peak 1**

Calibration factor Peak 1 100ppb ISTD= $\frac{\text{peak area}}{\text{Mass injected ng}}$
Column1

$$= \frac{27688535}{0.100}$$

= 276885350 calibration factor for Peak 1 100ppb

Average of 5 peaks = 244747360

Sample **XA100**
Ax = 452571882
CF = 244747360
Vt = 10000
Vi = 1.0
Ws = 30.1
D = 1.0
GPC = 1.0
DF = 1.0

$$\text{Concentration ug/Kg (Dry weight basis)} = \frac{(Ax)\ (Vt)\ (DF)\ (GPC)}{(CF)\ (Vi)\ (Ws)\ (D)}$$

$$= \frac{(452571882)\ (10000)\ (1.0)\ (1.0)}{(244747360)\ (1.0)\ (30.1)\ (1.0)}$$

Peak 1 = 614.33

Average of 5 peaks = 669.80

Reported results = 670 ug/kg

I certify that the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. The laboratory manager or his designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Signature ________________________ Name: Nimisha Pandya.

Date: ___________________________ Title: Document Control Officer.