Addendum No. 3
to the Bidding Documents

Shuttle Meadow Pump Station Rehabilitation
Plainville, Connecticut

Issued November 28, 2023

Under the provisions of Article 7 of Section 00200, Instructions to Bidders, Bidders are informed that the Bidding Documents for the above-mentioned Project are modified, corrected, and/or supplemented as follows. Addendum No. 3 becomes part of the Bidding Documents and Contract Documents.

Acknowledge receipt of this addendum by inserting its number on Page 00410-3, Article 5.2 of the Bid form. Failure to acknowledge receipt of the Addendum may subject the Bidder to disqualification.

Project Manual Changes

Item 3-1 Section 00300 – Geotechnical Data

Add the attached Table 1 Soil Summary, Table 2 Groundwater Summary, Analytical Report GCM45897, Analytical Report GCM75456, and Analytical Report GCM45903.

Item 3-2 Section 00410 – Bid Form

Delete Section 00410 – Bid Form and **replace** it with the attached Section 00410.

Clarification: *The Bid Form has been modified as follows:*

- Item 2 – Flygt Pumps, Control Panel, VFDs, and Instrumentation has been updated from $289,575 to $312,720 to reflect changes based on the specification changes incorporated in this Addendum.
- Item 4 – Polluted or Excess Contaminated Soil Excavation and Disposal, has been modified to only include Disposal of Excess Contaminated Soil.
- Item 8 – Pump Spare Parts has been updated from $100,142 to $102,175 to reflect changes based on the specification changes incorporated in this Addendum.
- Item 9 – Utility Allowance, has been increased from $20,000 to $100,000.
- Item 11 – Disposal of Excess Polluted Soil, has been added as a separate item from Item 4.
- Item 12 – Traffic Police, has been added.

Item 3-3 Section 01290 – Application and Certificate for Payment

Delete Section 01290 – Application and Certificate for Payment in its entirety and **replace** it with the attached Section 01290.

Clarification: *Section 01290 has been modified to correspond with the changes to the Bid Form.*

Item 3-4 Section 02518 – Valves and Hydrants

Delete Paragraph 2.4.G in its entirety.

Clarification: *Check valve limit switches are not required.*

Item 3-5 Section 11312 – Submersible Wastewater Pumping Equipment

Delete Section 11312 – Submersible Wastewater Pumping Equipment in its entirety and **replace** it with the attached Section 11312.

Item 3-6 Section 13420 – Instrumentation

Delete this Section in its entirety.

Clarification: *Instrumentation has been added to Section 11312; Section 13420 is not required.*

Drawing Changes

Item 3-7 Drawing M-101

Delete Drawing M-101 in its entirety and **replace** it with the attached marked-up Drawing M-101.

Clarification: *Drawing M-101 has been revised to 1) replace the float switches with a multritrode level probe and 2) add a flow meter within the valve vault.*

Item 3-8 Drawing E-100

Delete Drawing E-100 in its entirety and **replace** it with the attached Drawing E-100.

Clarification: *Drawing E-100 has been revised to 1) replace the float switches with a multritrode level probe and 2) add a flow meter within the valve vault.*

Item 3-9 Drawing E-101

Delete Drawing E-101 in its entirety and **replace** it with the attached Drawing E-101.

Clarification: *Drawing E-101 has been revised to 1) add an FIT, and 2) add detail to the mixer power and controls language.*

Item 3-10 Drawing E-501

Delete Drawing E-501 in its entirety and **replace** it with the attached Drawing E-501.

Clarification: *Drawing E-501 has been revised to support the changes associated with E-100 and E-101 and to replace the missing Transformer Connection/Ground Detail.*

Item 3-11 Drawing E-602

Delete Drawing E-602 in its entirety and **replace** it with the attached Drawing E-602.

Clarification: *Drawing E-602 has been revised to reflect 1) changes from float switches to a Multitrode level probe; 2) adding a flow meter; 3) modifying the VFD wiring in conjunction with edits to Section 11312; and 4) clarifying details associated with the fiber optic connection.*

Bidding Period Questions & Responses

The following responses/clarifications are based on questions raised during the bidding period.

1. **Question:** Due to the characterization (not meeting backfill gradation/specification) of the existing soil there is no appropriate reuse application. Please confirm that all existing soil can be in-situ tested, categorized, live-loaded, and disposed of accordingly without intermediate stockpiling as specified? This procedure would include the natural, contaminated, and polluted soil disposal.

   Answer: The Contractor may elect to conduct in-situ soil characterization sampling to help facilitate live-loading and reduce stockpiling and soil handling. The Contractor is responsible for costs associated with any drilling, test pit excavation, or other means for collecting the necessary samples. The Engineer will observe the sampling activities and select soils for laboratory analysis.

2. **Question:** Polluted and contaminated soils have different disposal criteria and costs, can these be made separate unit price items on the bid form?

   Answer: The Bid Form has been revised accordingly. Refer to Items 3-2 and 3-3 above.

3. **Question:** Can you please provide the prior soil testing information so we may price accordingly? Based on prior test results, what are the contaminants of the

contaminated soil? Also what are the levels of the contaminants? What are the pollutants of the polluted soil? Also what are the levels of the pollutants? What level of hazardous material is the contaminated and polluted materials? Is this a HAZWOPER site? Based on the prior testing results, are there going to be a minimal level of HAZMAT Training/Licensing required to handle the material onsite?

Answer: See Item 3-1 above. Tables 1 and 2 as well as analytical lab reports GCM45897, GCM75456, and GCM45903 have all been attached to this addendum. These tables are referenced in Section 02110 as being included in Section 00300. Health and safety expectations for this project are defined in Section 01350. The Contractor is responsible for determining what level of training is required for their workers.

4. **Question:** Is the bidder correct to understand the following are cost elements to be included in bid item No. 4: the cost to prepare and submit the strategic excavation plan; the cost to prepare and submit a specific health and safety plan for removal and disposal of regulated earthen material; the cost of soil sampling; the cost of laboratory testing; the cost of a QEP/LEP for oversight and management; the cost of excavating and loading the regulated soils; the cost of transporting the regulated soils; the receiving facility cost (i.e., tipping fees); the cost of decontaminating equipment and trucks prior to exiting the site; the use of HAZWOPER 40 trained personnel; the cost of backfill, provided and installed, to replace regulated soil removed; confirmation that the regulated soils are above the water table.

   Answer: Refer to the attached revised Section 01290 for a detailed description of bid items, including Items 4 and 11. These unit price bid items are intended as payment for all excavation, backfill, compaction, removal and proper off-site disposal of the polluted or contaminated material, and all labor, equipment and materials required for or incident to the work. Note that as a unit price, the cost paid will be based on actual measured quantities of disposed materials. Scope that is not based on the quantity of excess polluted or contaminated soil should be included in the lump sum Item 1. Engineer will collect waste disposal characterization samples for laboratory analysis.

5. **Question:** Due to the limited available working area at the job site periodic road closings and traffic relocations will be required to offload material and equipment. Clarify the following:

   a. Can an allowance be established for police/traffic control?

      Answer: An allowance of $6,000 has been set for police details. See Item 3-2 above.

   b. Confirm there will be a permanent sidewalk shutdown allowed in front of the pump station due to pedestrian safety concerns.

      Answer: Yes, a shutdown of the sidewalk adjacent to the active construction site is acceptable for the duration of active work onsite.

c. Our preliminary shoring and dewatering designs indicate a requirement to install sheeting to a depth of approximately 50' from the existing grade. The equipment required to be offload and install sheets of this length will not be able to safely maneuver onsite with the existing overhead utilities in their current location. Please confirm the relocation of the existing overhead utilities is anticipated in the project scope and covered in Bid Item No. 9.

Answer: The Utility Allowance covered in Bid Item No. 9 has been increased from $20,000 to $100,000 to cover the potential relocation of existing overhead utilities. Please refer to the attached survey showing an unnumbered utility pole that was not picked up during the survey. The Contractor's shoring and dewatering designs shall be submitted and approved prior to incurring costs for relocating the overhead utilities. The Contractor is responsible for coordinating with the utility companies as required.

d. Please confirm that the Town's property, southeast of the LoC between the road and floodway boundary identified on C-101, can be utilized by the Contractor for crane/equipment access, offloading, and storage of materials. This would extend the Limits of Construction shown on Drawing D-101.

Answer: The Contractor will be allowed the use of a 75' long by 30' wide rectangular area immediately south of the limits of disturbance shown on the plans for the purposes of storage and staging. The staging area will be placed such that the longest side is parallel to Shuttle Meadow Road as close to the right of way line as possible to maximize horizontal separation from nearby wetlands. The Contractor shall engage a Land Surveyor registered in the State of Connecticut to stake out the limits of this area for the Town's review prior to undertaking any work in the area. The area shall be cleared and grubbed, with approximately 10 trees over 8" dbh to be removed. Once cleared, a row of silt fence backed by a straw wattle shall be placed on the southerly and westerly outside limits of the staging area. The topsoil shall be removed, and the cleared staging area shall be regraded as needed. The staging area shall be surfaced with a minimum of 6 inches of crushed stone, meeting CTDOT gradation No. 3. The staging area shall also be enclosed with a temporary 6' high chain link construction fence, with gate opening to the north, toward the existing limits of construction.

Upon completion of the project, or exhaustion of storage needs, whichever comes first, all stored materials and equipment shall be removed, and the crushed stone shall be removed along with the temporary fencing. The underlying soil shall be scarified and treated with 4 inches of topsoil and native grass seed. Ten deciduous trees 2 to 2-1/2" caliper shall be planted evenly throughout the site. Once vegetation is established, the sediment and erosion controls may be removed.

The Town will be requesting a modification to its existing inland wetlands permit to incorporate the storage area. The Contractor should assume

that a financial guarantee will be required by the Contractor to ensure restoration.

6. **Question:** Section 00300 Geotechnical Data includes one gradation sampled at 1' to 3' depth (above the water table). The boring indicates that samples were taken at numerous intervals and depths. Can additional gradation/characterization of the soils in deeper locations be provided for the purpose of analyzing dewatering methodologies?

   Answer: The data included in Section 00300, in addition to Item 3-1 and the attachments to this addendum, are all the data available at this time regarding the existing soil gradation.

7. **Question:** Item 8 of the suggested sequence of work on Drawing C-101 notes potentially using a vac truck to manage flow in the existing wet well to make piping connections to the new pump station. Please confirm the material can be disposed of for no charge at the Town's Wastewater Treatment Facility.

   Answer: The Plainville Water Pollution Control Facility will accept loads originating from the Shuttle Meadow Pump Station free of charge. However, coordination with the Town is required to ensure the loads are coming from Shuttle Meadow PS and not elsewhere. The capacity of the trucks, and a count of how many trucks discharge at the WPCF, will be required so the Town can monitor flow rates.

8. **Question:** The new pump station discharge/SFM connection to the existing force main denotes an MJ WYE and a concrete thrust block on Drawing C-101. Due to the limited room and proximity to the waterway, can we alternatively connect up-line of the 8" Bypass Tee and 10" plug valve installed in Contract 2000-25 (not shown on C-101) where the current FM leaves the "can" PS with the new 8" SFM line via a tee/wye/bend? This method will prevent having to shut down and drain the entire FM. Additionally, the connection location currently shown will be very difficult to install at the anticipated depth, adjacent to the river.

   Answer: As shown on Drawing D-101, the design intent is to demolish the existing 10" plug valve and 8" bypass tee at this time to eliminate the potential for future issues with these unnecessary valves. The Contractor may connect to the existing forcemain immediately downstream of the existing 8" bypass connection.

END OF ADDENDUM NO. 3

J:\P\P0659 Plainville, CT\023_Shuttle Meadow WW PS\Bidding\Addendum 3\Addendum 3.docx

Tighe&Bond

TABLE 1
Summary of Soil Analytical Results
Shuttle Meadow Pump Station Rehabilitation
66 Shuttle Meadow Road
Plainville, Connecticut
Last Updated: 11/21/2023 (I. Adomeit)

Sample Name	**CTDEEP RSR Criteria**						**B-1**	**B-1**	**B-2**	**B-2**
Sample Depth							1 - 3 ft	12 - 14 ft	1 - 3 ft	7 - 9 ft
Sample Date							9/29/2022	9/29/2022	9/29/2022	9/29/2022
Lab Sample ID	RES	I/C	GA	GB	GWPC	GWPC	CM45897	CM45898	CM45899	CM45900
Lab Report ID	DEC	DEC	PMC	PMC		x10	GCM45897	GCM45897	GCM45897	GCM45897
CTETPH 8015D (mg/Kg)	500	2,500	500	2,500	NA	NA	<260	<60	<270	<270
Metals 6010D (mg/Kg)										
Arsenic	10	10	NA	NA	NA	NA	1.03	<0.77	1.65	1.12
Barium	4,700	140,000	NA	NA	NA	NA	24.1	13.8	28.2	37.1
Cadmium	34	1,000	NA	NA	NA	NA	1.31	0.84	1.78	4.13
Chromium (Total)	NE	NE	NA	NA	NA	NA	9.15	5.67	9.88	18.8
Lead	400	1,000	NA	NA	NA	NA	11.9	6.03	19.2	24.8
Mercury (7471B)	20	610	NA	NA	NA	NA	<0.03	<0.03	0.03	0.12
Selenium	340	10,000	NA	NA	NA	NA	<1.5	<1.5	<1.3	<1.4
Silver	340	10,000	NA	NA	NA	NA	<0.38	<0.39	0.55	3.77
PCBs 8082A (mg/Kg)										
PCBs (Total)	1	10	NE	NE	NA	NA	ND	-	ND	-
Pesticides 8081B (mg/Kg)										
DDD, 4,4-	NE	NE	NE	NE	NA	NA	<0.0014	-	0.011	-
DDE, 4,4-	NE	NE	NE	NE	NA	NA	<0.0014	-	0.0085	-
DDT, 4,4-	NE	NE	NE	NE	NA	NA	0.0093	-	0.034	-
DDT (Total)	*1.8*	*17*	*0.003*	*0.02*	NA	NA	*0.0093*	-	*0.0535*	-
SPLP Pesticides 8081B (µg/L)	NA	NA	NA	NA	Varies	Varies	BRL	-	BRL	-
VOCs 8260C (mg/Kg)	Varies	Varies	Varies	Varies	NA	NA	-	-	BRL	-
SVOCs 8270D (mg/Kg)										
Acenaphthene	*1,000*	*2,500*	*8.4*	*84*	NA	NA	<0.25	<0.27	0.4	<0.25
Acenaphthylene	1,000	2,500	8.4	84	NA	NA	0.25	<0.27	2.7	1.3
Anthracene	1,000	2,500	40	400	NA	NA	<0.25	<0.27	3	0.69
Benzo(a)anthracene	1	7.8	1	1	NA	NA	<0.25	<0.27	5.7	1.4
Benzo(a)pyrene	1	1	1	1	NA	NA	0.29	<0.27	**4.7**	**1.9**
Benzo(b)fluoranthene	1	7.8	1	1	NA	NA	<0.25	<0.27	4.1	1.1
Benzo(g,h,i)perylene	*8.4*	*78*	*1*	*1*	NA	NA	<0.25	<0.27	*2.4*	*1.2*
Benzo(k)fluoranthene	8.4	78	1	1	NA	NA	<0.25	<0.27	3.8	1.3
Carbazole	*31*	*290*	*0.2*	*1*	NA	NA	<0.2	<0.2	*0.87*	<0.2
Chrysene	*84*	*780*	*1*	*1*	NA	NA	0.28	<0.27	*6.1*	*1.9*
Dibenz(a,h)anthracene	*1*	*1*	*1*	*1*	NA	NA	<0.25	<0.27	0.76	0.27
Dibenzofuran	*68*	*1,000*	*0.2*	*1.4*	NA	NA	<0.2	<0.2	*0.74*	<0.2
Fluoranthene	1,000	2,500	5.6	56	NA	NA	0.37	<0.27	17	2.1
Fluorene	1,000	2,500	5.6	56	NA	NA	<0.25	<0.27	1.7	<0.25
Indeno(1,2,3-cd)pyrene	*1*	*7.8*	*1*	*1*	NA	NA	<0.25	<0.27	*3*	*1.1*
Methylnaphthalene, 2-	*270*	*1,000*	*0.56*	*5.6*	NA	NA	<0.25	<0.27	0.52	<0.25
Phenanthrene	1,000	2,500	4	40	NA	NA	<0.25	<0.27	18	2
Pyrene	1,000	2,500	4	40	NA	NA	0.47	<0.27	16	3.1
SPLP PAHs 8270D (SIM) (µg/L)										
Phenanthrene	NA	NA	NA	NA	200	2,000	-	-	0.08	<0.06

CTDEEP RSRs - Connecticut Department of Energy and Environmental Protection Remediation Standard Regulations (February 16, 2021) and *CTDEEP Additional Polluting Substances (September 20, 2018)*
CT ETPH - Connecticut Department of Public Health Extractable Total Petroleum Hydrocarbons
NE - Not established; NA - Not Applicable; BRL - Below Reporting Limits
<xx indicates compound was not reported above laboratory limits.
"-" - Sample not analyzed
Only parameters reported above reporting limits are summarized above
Mass results presented in milligrams per kilogram (mg/kg), are equivalent to parts per million (ppm)
SPLP results presented in micrograms per liter (µg/L), are equivalent to parts per billion (ppb)
PCBs - Polychlorinated Biphenyls
SVOCs - Semi-Volatile Organic Compounds
VOCs - Volatile Organic Compounds
PAHs - Polycyclic Aromatic Hydrocarbons
SPLP - Synthetic Precipitation Leaching Procedure
RES DEC - Residential Direct Exposure Criteria
I/C DEC - Industrial/Commercial Direct Exposure Criteria
GA PMC - Pollutant Mobility Criteria in a GA groundwater area
GB PMC - Pollutant Mobility Criteria in a GB groundwater area
GWPC - Groundwater Protection Criteria
Boxed values indicate exceedances of RES DEC
Bold values indicate exceedances of I/C DEC
Light gray shaded values indicate exceedance of GA PMC
Dark gray shaded values indicate exceedance of GB PMC

TABLE 2
Summary of Groundwater Analytical Results
Shuttle Meadow Pump Station Rehabilitation
66 Shuttle Meadow Road
Plainville, Connecticut
Last Updated: 11/21/2023 (I. Adomeit)

Sample Name	**CTDEEP RSR Criteria**		**B-1-GW**	**MW-1**
Sample Date			9/29/2022	11/2/2022
Lab Sample ID	GWPC	SWPC	CM45903	CM75456
Lab Report ID			GCM45903	GCM75456
CTETPH 8015D (µg/L)	250	*250*	<71	-
Metals 6010D (µg/L)				
Antimony	6	86,000	<5	<5
Arsenic	50	4	22	<4
Barium	1,000	*2,200*	1,860	18
Beryllium	4	4	3	<1
Cadmium	5	6	2	<1
Chromium (Total)	50	NE	19	<1
Copper	1,300	48	47	<5
Lead	15	13	28	<2
Mercury (7470A)	2	0.4	<0.2	<0.2
Nickel	100	880	45	<1
Selenium	50	50	<10	<10
Silver	36	12	<1	<1
Thallium (6020B)	5	63	<0.5	<0.5
Vanadium	50	*270*	53	<2
Zinc	5,000	123	81	<4
PAHs 8270D (SIM) (µg/L)				
Methylnaphthalene, 2-	*28*	*62*	0.59	-
Naphthalene	280	*210*	0.64	-
Phenanthrene	200	*14*	0.22	-
VOCs 8260C (µg/L)	Varies	Varies	BRL	-

CTDEEP RSRs - Connecticut Department of Energy and Environmental Protection Remediation Standard Regulations (February 16, 2021) and *CTDEEP Additional Polluting Substances (September 20, 2018)*
CT ETPH - Connecticut Department of Public Health Extractable Total Petroleum Hydrocarbons
NE - Not established
NA - Not Applicable
<xx indicates compound was not reported above laboratory limits.
"-" - Sample not analyzed
Only VOC and PAH parameters reported above reporting limits are summarized above
Gray shaded values indicate exceedance of SWPC
Blue values indicates exceedance of GWPC
Results presented in micrograms per liter (µg/L)
PAHs - Polycyclic Aromatic Hydrocarbons
VOCs - Volatile Organic Compounds

PHOENIX
Environmental Laboratories, Inc.

Monday, October 24, 2022

Attn: Harley Langford
Tighe & Bond
213 Court St, Suite 1100
Middletown, CT 06457

Project ID: SHUTTLE MEADOW PS
SDG ID: GCM45897
Sample ID#s: CM45897 - CM45900

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

Enclosed are revised Analysis Report pages. Please replace and discard the original pages. If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

SDG Comments

October 24, 2022

SDG I.D.: GCM45897

Sample ID CM45897, CM45899 and CM45900
The SPLP analysis for pesticides and/or PAH's was requested past the analytical holding time.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

October 24, 2022

SDG I.D.: GCM45897

Project ID: SHUTTLE MEADOW PS

Client Id	Lab Id	Matrix
B-1 (1-3)	CM45897	SOIL
B-1 (12-14)	CM45898	SOIL
B-2 (1-3)	CM45899	SOIL
B-2 (7-9)	CM45900	SOIL

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 24, 2022

FOR: Attn: Harley Langford
Tighe & Bond
213 Court St, Suite 1100
Middletown, CT 06457

Sample Information		Custody Information		Date	Time
Matrix:	SOIL	Collected by:		09/29/22	8:40
Location Code:	TIGHE-DAS	Received by:	CP	09/30/22	11:50
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	25-0659-023A				

Laboratory Data

SDG ID: GCM45897
Phoenix ID: CM45897

Project ID: SHUTTLE MEADOW PS
Client ID: B-1 (1-3)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.38	0.38	mg/Kg	1	10/06/22	TH	SW6010D
Arsenic	1.03	0.76	mg/Kg	1	10/06/22	TH	SW6010D
Barium	24.1	0.38	mg/Kg	1	10/06/22	TH	SW6010D
Cadmium	1.31	0.38	mg/Kg	1	10/06/22	TH	SW6010D
Chromium	9.15	0.38	mg/Kg	1	10/06/22	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/10/22	IE	SW7471B
Lead	11.9	0.38	mg/Kg	1	10/06/22	TH	SW6010D
Selenium	< 1.5	1.5	mg/Kg	1	10/06/22	TH	SW6010D
Percent Solid	93		%		09/30/22	al	SW846-%Solid
Soil Extraction for PCB	Completed				09/30/22	O/Y	SW3545A
Soil Extraction for Pesticide	Completed				09/30/22	O/Y	SW3545A
Mercury Digestion	Completed				10/07/22	KL/KL	SW7471B
Extraction of ETPH	Completed				10/04/22	Z/MO	SW3546
Soil Extraction for SVOA	Completed				10/04/22	H/U	SW3546
SPLP Extraction for Organics	Completed				10/19/22	AB	SW1312
SPLP Pesticides Ext.	Completed				10/20/22	P	SW3510C
Total Metals Digest	Completed				09/30/22	M/AG	SW3050B
TPH by GC (Extractable Products)							
Ext. Petroleum H.C. (C9-C36)	ND	260	mg/Kg	5	10/05/22	JRB	CTETPH 8015D
Identification	ND		mg/Kg	5	10/05/22	JRB	CTETPH 8015D
QA/QC Surrogates							
% COD (surr)	83		%	5	10/05/22	JRB	50 - 150 %
% Terphenyl (surr)	75		%	5	10/05/22	JRB	50 - 150 %
Polychlorinated Biphenyls							
PCB-1016	ND	360	ug/Kg	10	10/03/22	SC	SW8082A

Project ID: SHUTTLE MEADOW PS
Client ID: B-1 (1-3)

Phoenix I.D.: CM45897

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
PCB-1221	ND	360	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1232	ND	360	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1242	ND	360	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1248	ND	360	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1254	ND	360	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1260	ND	360	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1262	ND	360	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1268	ND	360	ug/Kg	10	10/03/22	SC	SW8082A
QA/QC Surrogates							
% DCBP	82		%	10	10/03/22	SC	30 - 150 %
% DCBP (Confirmation)	69		%	10	10/03/22	SC	30 - 150 %
% TCMX	82		%	10	10/03/22	SC	30 - 150 %
% TCMX (Confirmation)	81		%	10	10/03/22	SC	30 - 150 %
Pesticides							
4,4' -DDD	ND	1.4	ug/Kg	2	10/04/22	AW	SW8081B
4,4' -DDE	ND	1.4	ug/Kg	2	10/04/22	AW	SW8081B
4,4' -DDT	9.3	7.1	ug/Kg	2	10/04/22	AW	SW8081B
a-BHC	ND	1.4	ug/Kg	2	10/04/22	AW	SW8081B
Alachlor	ND	7.1	ug/Kg	2	10/04/22	AW	SW8081B
Aldrin	ND	1.4	ug/Kg	2	10/04/22	AW	SW8081B
b-BHC	ND	1.4	ug/Kg	2	10/04/22	AW	SW8081B
Chlordane	ND	36	ug/Kg	2	10/04/22	AW	SW8081B
d-BHC	ND	1.4	ug/Kg	2	10/04/22	AW	SW8081B
Dieldrin	ND	3.6	ug/Kg	2	10/04/22	AW	SW8081B
Endosulfan I	ND	7.1	ug/Kg	2	10/04/22	AW	SW8081B
Endosulfan II	ND	7.1	ug/Kg	2	10/04/22	AW	SW8081B
Endosulfan sulfate	ND	7.1	ug/Kg	2	10/04/22	AW	SW8081B
Endrin	ND	7.1	ug/Kg	2	10/04/22	AW	SW8081B
Endrin aldehyde	ND	7.1	ug/Kg	2	10/04/22	AW	SW8081B
Endrin ketone	ND	7.1	ug/Kg	2	10/04/22	AW	SW8081B
g-BHC	ND	1.4	ug/Kg	2	10/04/22	AW	SW8081B
Heptachlor	ND	7.1	ug/Kg	2	10/04/22	AW	SW8081B
Heptachlor epoxide	ND	7.1	ug/Kg	2	10/04/22	AW	SW8081B
Methoxychlor	ND	36	ug/Kg	2	10/04/22	AW	SW8081B
Toxaphene	ND	140	ug/Kg	2	10/04/22	AW	SW8081B
QA/QC Surrogates							
% DCBP	77		%	2	10/04/22	AW	30 - 150 %
% DCBP (Confirmation)	70		%	2	10/04/22	AW	30 - 150 %
% TCMX	68		%	2	10/04/22	AW	30 - 150 %
% TCMX (Confirmation)	69		%	2	10/04/22	AW	30 - 150 %
SPLP Pesticides							
4,4' -DDD	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
4,4' -DDE	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
4,4' -DDT	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
a-BHC	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
Alachlor	ND	0.010	ug/L	1	10/22/22	AW	SW8081B
Aldrin	ND	0.003	ug/L	1	10/22/22	AW	SW8081B
b-BHC	ND	0.005	ug/L	1	10/22/22	AW	SW8081B

Project ID: SHUTTLE MEADOW PS
Client ID: B-1 (1-3)

Phoenix I.D.: CM45897

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference	
Chlordane	ND	0.050	ug/L	1	10/22/22	AW	SW8081B	
d-BHC	ND	0.005	ug/L	1	10/22/22	AW	SW8081B	
Dieldrin	ND	0.002	ug/L	1	10/22/22	AW	SW8081B	
Endosulfan I	ND	0.005	ug/L	1	10/22/22	AW	SW8081B	
Endosulfan II	ND	0.005	ug/L	1	10/22/22	AW	SW8081B	
Endosulfan sulfate	ND	0.005	ug/L	1	10/22/22	AW	SW8081B	
Endrin	ND	0.005	ug/L	1	10/22/22	AW	SW8081B	
Endrin aldehyde	ND	0.005	ug/L	1	10/22/22	AW	SW8081B	
Endrin Ketone	ND	0.005	ug/L	1	10/22/22	AW	SW8081B	
g-BHC	ND	0.005	ug/L	1	10/22/22	AW	SW8081B	
Heptachlor	ND	0.005	ug/L	1	10/22/22	AW	SW8081B	
Heptachlor epoxide	ND	0.005	ug/L	1	10/22/22	AW	SW8081B	
Methoxychlor	ND	0.005	ug/L	1	10/22/22	AW	SW8081B	
Toxaphene	ND	0.20	ug/L	1	10/22/22	AW	SW8081B	
QA/QC Surrogates								
%DCBP (Surrogate Rec)	44		%	1	10/22/22	AW	30 - 150 %	
%DCBP (Surrogate Rec) (Confirmation)	21		%	1	10/22/22	AW	30 - 150 %	3
%TCMX (Surrogate Rec)	58		%	1	10/22/22	AW	30 - 150 %	
%TCMX (Surrogate Rec) (Confirmation)	36		%	1	10/22/22	AW	30 - 150 %	
Semivolatiles								
1,2,4,5-Tetrachlorobenzene	ND	100	ug/Kg	1	10/05/22	WB	SW8270D	
1,2,4-Trichlorobenzene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
1,2-Dichlorobenzene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
1,2-Diphenylhydrazine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D	
1,3-Dichlorobenzene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
1,4-Dichlorobenzene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
2,2'-Oxybis(1-Chloropropane)	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
2,4,5-Trichlorophenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
2,4,6-Trichlorophenol	ND	200	ug/Kg	1	10/05/22	WB	SW8270D	
2,4-Dichlorophenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
2,4-Dimethylphenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
2,4-Dinitrophenol	ND	300	ug/Kg	1	10/05/22	WB	SW8270D	
2,4-Dinitrotoluene	ND	200	ug/Kg	1	10/05/22	WB	SW8270D	
2,6-Dinitrotoluene	ND	200	ug/Kg	1	10/05/22	WB	SW8270D	
2-Chloronaphthalene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
2-Chlorophenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
2-Methylnaphthalene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
2-Methylphenol (o-cresol)	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
2-Nitroaniline	ND	300	ug/Kg	1	10/05/22	WB	SW8270D	
2-Nitrophenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
3&4-Methylphenol (m&p-cresol)	ND	350	ug/Kg	1	10/05/22	WB	SW8270D	
3,3'-Dichlorobenzidine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D	
3-Nitroaniline	ND	300	ug/Kg	1	10/05/22	WB	SW8270D	
4,6-Dinitro-2-methylphenol	ND	300	ug/Kg	1	10/05/22	WB	SW8270D	
4-Bromophenyl phenyl ether	ND	350	ug/Kg	1	10/05/22	WB	SW8270D	
4-Chloro-3-methylphenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
4-Chloroaniline	ND	200	ug/Kg	1	10/05/22	WB	SW8270D	
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	1	10/05/22	WB	SW8270D	
4-Nitroaniline	ND	300	ug/Kg	1	10/05/22	WB	SW8270D	

Project ID: SHUTTLE MEADOW PS
Client ID: B-1 (1-3)

Phoenix I.D.: CM45897

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
4-Nitrophenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Acenaphthene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Acenaphthylene	250	250	ug/Kg	1	10/05/22	WB	SW8270D
Acetophenone	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Aniline	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Anthracene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Benz(a)anthracene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Benzidine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Benzo(a)pyrene	290	250	ug/Kg	1	10/05/22	WB	SW8270D
Benzo(b)fluoranthene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Benzo(ghi)perylene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Benzo(k)fluoranthene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Benzoic acid	ND	700	ug/Kg	1	10/05/22	WB	SW8270D
Benzyl butyl phthalate	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Bis(2-chloroethyl)ether	ND	350	ug/Kg	1	10/05/22	WB	SW8270D
Bis(2-ethylhexyl)phthalate	ND	350	ug/Kg	1	10/05/22	WB	SW8270D
Carbazole	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Chrysene	280	250	ug/Kg	1	10/05/22	WB	SW8270D
Dibenz(a,h)anthracene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Dibenzofuran	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Diethyl phthalate	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Dimethylphthalate	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Di-n-butylphthalate	ND	350	ug/Kg	1	10/05/22	WB	SW8270D
Di-n-octylphthalate	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Fluoranthene	370	250	ug/Kg	1	10/05/22	WB	SW8270D
Fluorene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Hexachlorobenzene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Hexachlorobutadiene	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Hexachlorocyclopentadiene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Hexachloroethane	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Indeno(1,2,3-cd)pyrene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Isophorone	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Naphthalene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Nitrobenzene	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
N-Nitrosodimethylamine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
N-Nitrosodi-n-propylamine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
N-Nitrosodiphenylamine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Pentachloronitrobenzene	ND	140	ug/Kg	1	10/05/22	WB	SW8270D
Pentachlorophenol	ND	350	ug/Kg	1	10/05/22	WB	SW8270D
Phenanthrene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Phenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Pyrene	470	250	ug/Kg	1	10/05/22	WB	SW8270D
Pyridine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
QA/QC Surrogates							
% 2,4,6-Tribromophenol	75		%	1	10/05/22	WB	30 - 130 %
% 2-Fluorobiphenyl	57		%	1	10/05/22	WB	30 - 130 %
% 2-Fluorophenol	58		%	1	10/05/22	WB	30 - 130 %
% Nitrobenzene-d5	57		%	1	10/05/22	WB	30 - 130 %

Project ID: SHUTTLE MEADOW PS
Client ID: B-1 (1-3)

Phoenix I.D.: CM45897

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Phenol-d5	66		%	1	10/05/22	WB	30 - 130 %
% Terphenyl-d14	75		%	1	10/05/22	WB	30 - 130 %

3 = This parameter exceeds laboratory specified limits.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
October 24, 2022
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 24, 2022

FOR: Attn: Harley Langford
Tighe & Bond
213 Court St, Suite 1100
Middletown, CT 06457

Sample Information		Custody Information		Date	Time
Matrix:	SOIL	Collected by:		09/29/22	9:15
Location Code:	TIGHE-DAS	Received by:	CP	09/30/22	11:50
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	25-0659-023A				

Laboratory Data

SDG ID: GCM45897
Phoenix ID: CM45898

Project ID: SHUTTLE MEADOW PS
Client ID: B-1 (12-14)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.39	0.39	mg/Kg	1	10/11/22	TH	SW6010D
Arsenic	< 0.77	0.77	mg/Kg	1	10/11/22	TH	SW6010D
Barium	13.8	0.39	mg/Kg	1	10/11/22	TH	SW6010D
Cadmium	0.84	0.39	mg/Kg	1	10/11/22	TH	SW6010D
Chromium	5.67	0.39	mg/Kg	1	10/11/22	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/10/22	IE	SW7471B
Lead	6.03	0.39	mg/Kg	1	10/11/22	TH	SW6010D
Selenium	< 1.5	1.5	mg/Kg	1	10/11/22	TH	SW6010D
Percent Solid	83		%		09/30/22	al	SW846-%Solid
Mercury Digestion	Completed				10/07/22	KL/KL	SW7471B
Extraction of ETPH	Completed				10/04/22	Z/MO	SW3546
Soil Extraction for SVOA	Completed				10/04/22	H/U	SW3546
Total Metals Digest	Completed				09/30/22	M/AG	SW3050B
TPH by GC (Extractable Products)							
Ext. Petroleum H.C. (C9-C36)	ND	60	mg/Kg	1	10/06/22	JRB	CTETPH 8015D
Identification	ND		mg/Kg	1	10/06/22	JRB	CTETPH 8015D
QA/QC Surrogates							
% COD (surr)	99		%	1	10/06/22	JRB	50 - 150 %
% Terphenyl (surr)	91		%	1	10/06/22	JRB	50 - 150 %
Semivolatiles							
1,2,4,5-Tetrachlorobenzene	ND	100	ug/Kg	1	10/05/22	WB	SW8270D
1,2,4-Trichlorobenzene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
1,2-Dichlorobenzene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
1,2-Diphenylhydrazine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
1,3-Dichlorobenzene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D

Project ID: SHUTTLE MEADOW PS
Client ID: B-1 (12-14)

Phoenix I.D.: CM45898

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,4-Dichlorobenzene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
2,2'-Oxybis(1-Chloropropane)	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
2,4,5-Trichlorophenol	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
2,4,6-Trichlorophenol	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
2,4-Dichlorophenol	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
2,4-Dimethylphenol	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
2,4-Dinitrophenol	ND	300	ug/Kg	1	10/05/22	WB	SW8270D
2,4-Dinitrotoluene	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
2,6-Dinitrotoluene	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
2-Chloronaphthalene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
2-Chlorophenol	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
2-Methylnaphthalene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
2-Methylphenol (o-cresol)	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
2-Nitroaniline	ND	300	ug/Kg	1	10/05/22	WB	SW8270D
2-Nitrophenol	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	390	ug/Kg	1	10/05/22	WB	SW8270D
3,3'-Dichlorobenzidine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
3-Nitroaniline	ND	300	ug/Kg	1	10/05/22	WB	SW8270D
4,6-Dinitro-2-methylphenol	ND	300	ug/Kg	1	10/05/22	WB	SW8270D
4-Bromophenyl phenyl ether	ND	390	ug/Kg	1	10/05/22	WB	SW8270D
4-Chloro-3-methylphenol	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
4-Chloroaniline	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
4-Chlorophenyl phenyl ether	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
4-Nitroaniline	ND	300	ug/Kg	1	10/05/22	WB	SW8270D
4-Nitrophenol	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Acenaphthene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Acenaphthylene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Acetophenone	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Aniline	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Anthracene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Benz(a)anthracene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Benzidine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Benzo(a)pyrene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Benzo(b)fluoranthene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Benzo(ghi)perylene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Benzo(k)fluoranthene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Benzoic acid	ND	780	ug/Kg	1	10/05/22	WB	SW8270D
Benzyl butyl phthalate	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Bis(2-chloroethoxy)methane	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Bis(2-chloroethyl)ether	ND	390	ug/Kg	1	10/05/22	WB	SW8270D
Bis(2-ethylhexyl)phthalate	ND	390	ug/Kg	1	10/05/22	WB	SW8270D
Carbazole	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Chrysene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Dibenz(a,h)anthracene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Dibenzofuran	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Diethyl phthalate	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Dimethylphthalate	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Di-n-butylphthalate	ND	390	ug/Kg	1	10/05/22	WB	SW8270D
Di-n-octylphthalate	ND	270	ug/Kg	1	10/05/22	WB	SW8270D

Project ID: SHUTTLE MEADOW PS
Client ID: B-1 (12-14)

Phoenix I.D.: CM45898

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Fluoranthene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Fluorene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Hexachlorobenzene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Hexachlorobutadiene	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Hexachlorocyclopentadiene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Hexachloroethane	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Indeno(1,2,3-cd)pyrene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Isophorone	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Naphthalene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Nitrobenzene	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
N-Nitrosodimethylamine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
N-Nitrosodi-n-propylamine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
N-Nitrosodiphenylamine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Pentachloronitrobenzene	ND	140	ug/Kg	1	10/05/22	WB	SW8270D
Pentachlorophenol	ND	390	ug/Kg	1	10/05/22	WB	SW8270D
Phenanthrene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Phenol	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Pyrene	ND	270	ug/Kg	1	10/05/22	WB	SW8270D
Pyridine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
QA/QC Surrogates							
% 2,4,6-Tribromophenol	73		%	1	10/05/22	WB	30 - 130 %
% 2-Fluorobiphenyl	51		%	1	10/05/22	WB	30 - 130 %
% 2-Fluorophenol	51		%	1	10/05/22	WB	30 - 130 %
% Nitrobenzene-d5	51		%	1	10/05/22	WB	30 - 130 %
% Phenol-d5	54		%	1	10/05/22	WB	30 - 130 %
% Terphenyl-d14	69		%	1	10/05/22	WB	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
October 24, 2022
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 24, 2022

FOR: Attn: Harley Langford
Tighe & Bond
213 Court St, Suite 1100
Middletown, CT 06457

Sample Information		Custody Information		Date	Time
Matrix:	SOIL	Collected by:		09/29/22	11:40
Location Code:	TIGHE-DAS	Received by:	CP	09/30/22	11:50
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	25-0659-023A				

Laboratory Data

SDG ID: GCM45897
Phoenix ID: CM45899

Project ID: SHUTTLE MEADOW PS
Client ID: B-2 (1-3)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	0.55	0.33	mg/Kg	1	10/11/22	TH	SW6010D
Arsenic	1.65	0.66	mg/Kg	1	10/11/22	TH	SW6010D
Barium	28.2	0.33	mg/Kg	1	10/11/22	TH	SW6010D
Cadmium	1.78	0.33	mg/Kg	1	10/11/22	TH	SW6010D
Chromium	9.88	0.33	mg/Kg	1	10/11/22	TH	SW6010D
Mercury	0.03	0.03	mg/Kg	2	10/10/22	IE	SW7471B
Lead	19.2	0.33	mg/Kg	1	10/11/22	TH	SW6010D
Selenium	< 1.3	1.3	mg/Kg	1	10/11/22	TH	SW6010D
Percent Solid	93		%		09/30/22	al	SW846-%Solid
Soil Extraction for PCB	Completed				09/30/22	O/Y	SW3545A
Soil Extraction for Pesticide	Completed				09/30/22	O/Y	SW3545A
Field Extraction	Completed				09/29/22		SW5035A
Mercury Digestion	Completed				10/07/22	KL/KL	SW7471B
Extraction of ETPH	Completed				10/04/22	Z/MO	SW3546
Soil Extraction for SVOA	Completed				10/04/22	H/U	SW3546
SPLP Extraction for Organics	Completed				10/19/22	AB	SW1312
SPLP Semivolatiles (SIM) Ext.	Completed				10/20/22	X/MQ	SW3510C/SW3520C
SPLP Pesticides Ext.	Completed				10/20/22	P	SW3510C
Total Metals Digest	Completed				09/30/22	M/AG	SW3050B
TPH by GC (Extractable Products)							
Ext. Petroleum H.C. (C9-C36)	ND	270	mg/Kg	5	10/05/22	JRB	CTETPH 8015D
Identification	ND		mg/Kg	5	10/05/22	JRB	CTETPH 8015D
QA/QC Surrogates							
% COD (surr)	91		%	5	10/05/22	JRB	50 - 150 %
% Terphenyl (surr)	87		%	5	10/05/22	JRB	50 - 150 %

Ver 2

Project ID: SHUTTLE MEADOW PS
Client ID: B-2 (1-3)

Phoenix I.D.: CM45899

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Polychlorinated Biphenyls							
PCB-1016	ND	350	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1221	ND	350	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1232	ND	350	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1242	ND	350	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1248	ND	350	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1254	ND	350	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1260	ND	350	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1262	ND	350	ug/Kg	10	10/03/22	SC	SW8082A
PCB-1268	ND	350	ug/Kg	10	10/03/22	SC	SW8082A
QA/QC Surrogates							
% DCBP	73		%	10	10/03/22	SC	30 - 150 %
% DCBP (Confirmation)	65		%	10	10/03/22	SC	30 - 150 %
% TCMX	74		%	10	10/03/22	SC	30 - 150 %
% TCMX (Confirmation)	65		%	10	10/03/22	SC	30 - 150 %
Pesticides							
4,4' -DDD	11	1.4	ug/Kg	2	10/03/22	AW	SW8081B
4,4' -DDE	8.5	1.4	ug/Kg	2	10/03/22	AW	SW8081B
4,4' -DDT	34	7.1	ug/Kg	2	10/03/22	AW	SW8081B
a-BHC	ND	1.4	ug/Kg	2	10/03/22	AW	SW8081B
Alachlor	ND	7.1	ug/Kg	2	10/03/22	AW	SW8081B
Aldrin	ND	1.4	ug/Kg	2	10/03/22	AW	SW8081B
b-BHC	ND	1.4	ug/Kg	2	10/03/22	AW	SW8081B
Chlordane	ND	35	ug/Kg	2	10/03/22	AW	SW8081B
d-BHC	ND	1.4	ug/Kg	2	10/03/22	AW	SW8081B
Dieldrin	ND	3.5	ug/Kg	2	10/03/22	AW	SW8081B
Endosulfan I	ND	7.1	ug/Kg	2	10/03/22	AW	SW8081B
Endosulfan II	ND	7.1	ug/Kg	2	10/03/22	AW	SW8081B
Endosulfan sulfate	ND	7.1	ug/Kg	2	10/03/22	AW	SW8081B
Endrin	ND	7.1	ug/Kg	2	10/03/22	AW	SW8081B
Endrin aldehyde	ND	7.1	ug/Kg	2	10/03/22	AW	SW8081B
Endrin ketone	ND	7.1	ug/Kg	2	10/03/22	AW	SW8081B
g-BHC	ND	1.4	ug/Kg	2	10/03/22	AW	SW8081B
Heptachlor	ND	7.1	ug/Kg	2	10/03/22	AW	SW8081B
Heptachlor epoxide	ND	7.1	ug/Kg	2	10/03/22	AW	SW8081B
Methoxychlor	ND	35	ug/Kg	2	10/03/22	AW	SW8081B
Toxaphene	ND	140	ug/Kg	2	10/03/22	AW	SW8081B
QA/QC Surrogates							
% DCBP	61		%	2	10/03/22	AW	30 - 150 %
% DCBP (Confirmation)	66		%	2	10/03/22	AW	30 - 150 %
% TCMX	59		%	2	10/03/22	AW	30 - 150 %
% TCMX (Confirmation)	54		%	2	10/03/22	AW	30 - 150 %
SPLP Pesticides							
4,4' -DDD	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
4,4' -DDE	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
4,4' -DDT	ND	0.010	ug/L	1	10/22/22	AW	SW8081B
a-BHC	ND	0.005	ug/L	1	10/22/22	AW	SW8081B

Project ID: SHUTTLE MEADOW PS
Client ID: B-2 (1-3)

Phoenix I.D.: CM45899

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Alachlor	ND	0.010	ug/L	1	10/22/22	AW	SW8081B
Aldrin	ND	0.003	ug/L	1	10/22/22	AW	SW8081B
b-BHC	ND	0.010	ug/L	1	10/22/22	AW	SW8081B
Chlordane	ND	0.050	ug/L	1	10/22/22	AW	SW8081B
d-BHC	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
Dieldrin	ND	0.010	ug/L	1	10/22/22	AW	SW8081B
Endosulfan I	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
Endosulfan II	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
Endosulfan sulfate	ND	0.010	ug/L	1	10/22/22	AW	SW8081B
Endrin	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
Endrin aldehyde	ND	0.020	ug/L	1	10/22/22	AW	SW8081B
Endrin Ketone	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
g-BHC	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
Heptachlor	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
Heptachlor epoxide	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
Methoxychlor	ND	0.005	ug/L	1	10/22/22	AW	SW8081B
Toxaphene	ND	0.20	ug/L	1	10/22/22	AW	SW8081B
QA/QC Surrogates							
%DCBP (Surrogate Rec)	73		%	1	10/22/22	AW	30 - 150 %
%DCBP (Surrogate Rec) (Confirmation)	49		%	1	10/22/22	AW	30 - 150 %
%TCMX (Surrogate Rec)	109		%	1	10/22/22	AW	30 - 150 %
%TCMX (Surrogate Rec) (Confirmation)	76		%	1	10/22/22	AW	30 - 150 %
Volatiles							
1,1,1,2-Tetrachloroethane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,1,1-Trichloroethane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	3.1	ug/Kg	1	10/03/22	JLI	SW8260C
1,1,2-Trichloroethane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,1-Dichloroethane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,1-Dichloroethene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,1-Dichloropropene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,2,3-Trichloropropane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,2,4-Trimethylbenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	5.0	ug/Kg	1	10/03/22	JLI	SW8260C
1,2-Dibromoethane	ND	0.52	ug/Kg	1	10/03/22	JLI	SW8260C
1,2-Dichlorobenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,2-Dichloroethane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,2-Dichloropropane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,3,5-Trimethylbenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,3-Dichlorobenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,3-Dichloropropane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
1,4-Dichlorobenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
2,2-Dichloropropane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
2-Chlorotoluene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
2-Hexanone	ND	26	ug/Kg	1	10/03/22	JLI	SW8260C
2-Isopropyltoluene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
4-Chlorotoluene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
4-Methyl-2-pentanone	ND	26	ug/Kg	1	10/03/22	JLI	SW8260C

Project ID: SHUTTLE MEADOW PS
Client ID: B-2 (1-3)

Phoenix I.D.: CM45899

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Acetone	ND	260	ug/Kg	1	10/03/22	JLI	SW8260C
Acrylonitrile	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Benzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Bromobenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Bromochloromethane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Bromodichloromethane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Bromoform	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Bromomethane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Carbon Disulfide	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Carbon tetrachloride	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Chlorobenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Chloroethane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Chloroform	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Chloromethane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
cis-1,2-Dichloroethene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
cis-1,3-Dichloropropene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Dibromochloromethane	ND	3.1	ug/Kg	1	10/03/22	JLI	SW8260C
Dibromomethane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Dichlorodifluoromethane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Ethylbenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Hexachlorobutadiene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Isopropylbenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
m&p-Xylene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Methyl Ethyl Ketone	ND	31	ug/Kg	1	10/03/22	JLI	SW8260C
Methyl t-butyl ether (MTBE)	ND	10	ug/Kg	1	10/03/22	JLI	SW8260C
Methylene chloride	ND	10	ug/Kg	1	10/03/22	JLI	SW8260C
Naphthalene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
n-Butylbenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
n-Propylbenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
o-Xylene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
p-Isopropyltoluene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
sec-Butylbenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Styrene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
tert-Butylbenzene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Tetrachloroethene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Tetrahydrofuran (THF)	ND	10	ug/Kg	1	10/03/22	JLI	SW8260C
Toluene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Total Xylenes	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
trans-1,2-Dichloroethene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
trans-1,3-Dichloropropene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
trans-1,4-dichloro-2-butene	ND	10	ug/Kg	1	10/03/22	JLI	SW8260C
Trichloroethene	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Trichlorofluoromethane	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
Trichlorotrifluoroethane	ND	10	ug/Kg	1	10/03/22	JLI	SW8260C
Vinyl chloride	ND	5.2	ug/Kg	1	10/03/22	JLI	SW8260C
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	94		%	1	10/03/22	JLI	70 - 130 %
% Bromofluorobenzene	98		%	1	10/03/22	JLI	70 - 130 %
% Dibromofluoromethane	95		%	1	10/03/22	JLI	70 - 130 %

Project ID: SHUTTLE MEADOW PS
Client ID: B-2 (1-3)

Phoenix I.D.: CM45899

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Toluene-d8	99		%	1	10/03/22	JLI	70 - 130 %
Semivolatiles							
1,2,4,5-Tetrachlorobenzene	ND	100	ug/Kg	1	10/05/22	WB	SW8270D
1,2,4-Trichlorobenzene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
1,2-Dichlorobenzene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
1,2-Diphenylhydrazine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
1,3-Dichlorobenzene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
1,4-Dichlorobenzene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
2,2'-Oxybis(1-Chloropropane)	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
2,4,5-Trichlorophenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
2,4,6-Trichlorophenol	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
2,4-Dichlorophenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
2,4-Dimethylphenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
2,4-Dinitrophenol	ND	300	ug/Kg	1	10/05/22	WB	SW8270D
2,4-Dinitrotoluene	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
2,6-Dinitrotoluene	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
2-Chloronaphthalene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
2-Chlorophenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
2-Methylnaphthalene	520	250	ug/Kg	1	10/05/22	WB	SW8270D
2-Methylphenol (o-cresol)	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
2-Nitroaniline	ND	300	ug/Kg	1	10/05/22	WB	SW8270D
2-Nitrophenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	350	ug/Kg	1	10/05/22	WB	SW8270D
3,3'-Dichlorobenzidine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
3-Nitroaniline	ND	300	ug/Kg	1	10/05/22	WB	SW8270D
4,6-Dinitro-2-methylphenol	ND	300	ug/Kg	1	10/05/22	WB	SW8270D
4-Bromophenyl phenyl ether	ND	350	ug/Kg	1	10/05/22	WB	SW8270D
4-Chloro-3-methylphenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
4-Chloroaniline	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
4-Nitroaniline	ND	300	ug/Kg	1	10/05/22	WB	SW8270D
4-Nitrophenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Acenaphthene	400	250	ug/Kg	1	10/05/22	WB	SW8270D
Acenaphthylene	2700	250	ug/Kg	1	10/05/22	WB	SW8270D
Acetophenone	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Aniline	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Anthracene	3000	250	ug/Kg	1	10/05/22	WB	SW8270D
Benz(a)anthracene	5700	250	ug/Kg	1	10/05/22	WB	SW8270D
Benzidine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Benzo(a)pyrene	4700	250	ug/Kg	1	10/05/22	WB	SW8270D
Benzo(b)fluoranthene	4100	250	ug/Kg	1	10/05/22	WB	SW8270D
Benzo(ghi)perylene	2400	250	ug/Kg	1	10/05/22	WB	SW8270D
Benzo(k)fluoranthene	3800	250	ug/Kg	1	10/05/22	WB	SW8270D
Benzoic acid	ND	700	ug/Kg	1	10/05/22	WB	SW8270D
Benzyl butyl phthalate	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Bis(2-chloroethyl)ether	ND	350	ug/Kg	1	10/05/22	WB	SW8270D
Bis(2-ethylhexyl)phthalate	ND	350	ug/Kg	1	10/05/22	WB	SW8270D
Carbazole	870	350	ug/Kg	1	10/05/22	WB	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chrysene	6100	250	ug/Kg	1	10/05/22	WB	SW8270D
Dibenz(a,h)anthracene	760	250	ug/Kg	1	10/05/22	WB	SW8270D
Dibenzofuran	740	250	ug/Kg	1	10/05/22	WB	SW8270D
Diethyl phthalate	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Dimethylphthalate	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Di-n-butylphthalate	ND	350	ug/Kg	1	10/05/22	WB	SW8270D
Di-n-octylphthalate	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Fluoranthene	17000	2500	ug/Kg	10	10/05/22	WB	SW8270D
Fluorene	1700	250	ug/Kg	1	10/05/22	WB	SW8270D
Hexachlorobenzene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Hexachlorobutadiene	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Hexachlorocyclopentadiene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Hexachloroethane	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Indeno(1,2,3-cd)pyrene	3000	250	ug/Kg	1	10/05/22	WB	SW8270D
Isophorone	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Naphthalene	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Nitrobenzene	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
N-Nitrosodimethylamine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
N-Nitrosodi-n-propylamine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
N-Nitrosodiphenylamine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
Pentachloronitrobenzene	ND	140	ug/Kg	1	10/05/22	WB	SW8270D
Pentachlorophenol	ND	350	ug/Kg	1	10/05/22	WB	SW8270D
Phenanthrene	18000	2500	ug/Kg	10	10/05/22	WB	SW8270D
Phenol	ND	250	ug/Kg	1	10/05/22	WB	SW8270D
Pyrene	16000	2500	ug/Kg	10	10/05/22	WB	SW8270D
Pyridine	ND	200	ug/Kg	1	10/05/22	WB	SW8270D
QA/QC Surrogates							
% 2,4,6-Tribromophenol	53		%	1	10/05/22	WB	30 - 130 %
% 2-Fluorobiphenyl	38		%	1	10/05/22	WB	30 - 130 %
% 2-Fluorophenol	41		%	1	10/05/22	WB	30 - 130 %
% Nitrobenzene-d5	41		%	1	10/05/22	WB	30 - 130 %
% Phenol-d5	45		%	1	10/05/22	WB	30 - 130 %
% Terphenyl-d14	53		%	1	10/05/22	WB	30 - 130 %
% 2,4,6-Tribromophenol (10x)	Diluted Out		%	10	10/05/22	WB	30 - 130 %
% 2-Fluorobiphenyl (10x)	Diluted Out		%	10	10/05/22	WB	30 - 130 %
% 2-Fluorophenol (10x)	Diluted Out		%	10	10/05/22	WB	30 - 130 %
% Nitrobenzene-d5 (10x)	Diluted Out		%	10	10/05/22	WB	30 - 130 %
% Phenol-d5 (10x)	Diluted Out		%	10	10/05/22	WB	30 - 130 %
% Terphenyl-d14 (10x)	Diluted Out		%	10	10/05/22	WB	30 - 130 %

SPLP Semivolatiles by SIM

2-Methylnaphthalene	ND	0.56	ug/L	1	10/21/22	WB	SW8270D (SIM)
Acenaphthene	ND	0.56	ug/L	1	10/21/22	WB	SW8270D (SIM)
Acenaphthylene	ND	0.33	ug/L	1	10/21/22	WB	SW8270D (SIM)
Anthracene	ND	0.56	ug/L	1	10/21/22	WB	SW8270D (SIM)
Benz(a)anthracene	ND	0.06	ug/L	1	10/21/22	WB	SW8270D (SIM)
Benzo(a)pyrene	ND	0.22	ug/L	1	10/21/22	WB	SW8270D (SIM)
Benzo(b)fluoranthene	ND	0.08	ug/L	1	10/21/22	WB	SW8270D (SIM)
Benzo(ghi)perylene	ND	0.53	ug/L	1	10/21/22	WB	SW8270D (SIM)
Benzo(k)fluoranthene	ND	0.33	ug/L	1	10/21/22	WB	SW8270D (SIM)

Project ID: SHUTTLE MEADOW PS
Client ID: B-2 (1-3)

Phoenix I.D.: CM45899

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chrysene	ND	0.56	ug/L	1	10/21/22	WB	SW8270D (SIM)
Dibenz(a,h)anthracene	ND	0.11	ug/L	1	10/21/22	WB	SW8270D (SIM)
Fluoranthene	ND	0.56	ug/L	1	10/21/22	WB	SW8270D (SIM)
Fluorene	ND	0.56	ug/L	1	10/21/22	WB	SW8270D (SIM)
Indeno(1,2,3-cd)pyrene	ND	0.11	ug/L	1	10/21/22	WB	SW8270D (SIM)
Naphthalene	ND	0.56	ug/L	1	10/21/22	WB	SW8270D (SIM)
Phenanthrene	0.08	0.07	ug/L	1	10/21/22	WB	SW8270D (SIM)
Pyrene	ND	0.56	ug/L	1	10/21/22	WB	SW8270D (SIM)
QA/QC Surrogates							
% 2-Fluorobiphenyl	76		%	1	10/21/22	WB	30 - 130 %
% Nitrobenzene-d5	84		%	1	10/21/22	WB	30 - 130 %
% Terphenyl-d14	67		%	1	10/21/22	WB	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
October 24, 2022
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 24, 2022

FOR: Attn: Harley Langford
Tighe & Bond
213 Court St, Suite 1100
Middletown, CT 06457

Sample Information		Custody Information		Date	Time
Matrix:	SOIL	Collected by:		09/29/22	13:15
Location Code:	TIGHE-DAS	Received by:	CP	09/30/22	11:50
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	25-0659-023A				

Laboratory Data

SDG ID: GCM45897
Phoenix ID: CM45900

Project ID: SHUTTLE MEADOW PS
Client ID: B-2 (7-9)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	3.77	0.35	mg/Kg	1	10/11/22	TH	SW6010D
Arsenic	1.12	0.70	mg/Kg	1	10/11/22	TH	SW6010D
Barium	37.1	0.35	mg/Kg	1	10/11/22	TH	SW6010D
Cadmium	4.13	0.35	mg/Kg	1	10/11/22	TH	SW6010D
Chromium	18.8	0.35	mg/Kg	1	10/11/22	TH	SW6010D
Mercury	0.12	0.03	mg/Kg	2	10/10/22	IE	SW7471B
Lead	24.8	0.35	mg/Kg	1	10/11/22	TH	SW6010D
Selenium	< 1.4	1.4	mg/Kg	1	10/11/22	TH	SW6010D
Percent Solid	91		%		09/30/22	al	SW846-%Solid
Mercury Digestion	Completed				10/07/22	KL/KL	SW7471B
Extraction of ETPH	Completed				10/04/22	Z/MO	SW3546
Soil Extraction for SVOA	Completed				10/05/22	M/L/Y	SW3546
SPLP Extraction for Organics	Completed				10/19/22	AB	SW1312
SPLP Semivolatiles (SIM) Ext.	Completed				10/20/22	X/MQ	SW3510C/SW3520C
Total Metals Digest	Completed				09/30/22	M/AG	SW3050B
TPH by GC (Extractable Products)							
Ext. Petroleum H.C. (C9-C36)	ND	270	mg/Kg	5	10/05/22	JRB	CTETPH 8015D
Identification	ND		mg/Kg	5	10/05/22	JRB	CTETPH 8015D
QA/QC Surrogates							
% COD (surr)	122		%	5	10/05/22	JRB	50 - 150 %
% Terphenyl (surr)	73		%	5	10/05/22	JRB	50 - 150 %
Semivolatiles							
1,2,4,5-Tetrachlorobenzene	ND	100	ug/Kg	1	10/06/22	WB	SW8270D
1,2,4-Trichlorobenzene	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
1,2-Dichlorobenzene	ND	250	ug/Kg	1	10/06/22	WB	SW8270D

Project ID: SHUTTLE MEADOW PS
Client ID: B-2 (7-9)

Phoenix I.D.: CM45900

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
1,2-Diphenylhydrazine	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
1,3-Dichlorobenzene	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
1,4-Dichlorobenzene	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
2,2'-Oxybis(1-Chloropropane)	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
2,4,5-Trichlorophenol	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
2,4,6-Trichlorophenol	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
2,4-Dichlorophenol	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
2,4-Dimethylphenol	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
2,4-Dinitrophenol	ND	300	ug/Kg	1	10/06/22	WB	SW8270D
2,4-Dinitrotoluene	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
2,6-Dinitrotoluene	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
2-Chloronaphthalene	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
2-Chlorophenol	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
2-Methylnaphthalene	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
2-Methylphenol (o-cresol)	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
2-Nitroaniline	ND	300	ug/Kg	1	10/06/22	WB	SW8270D
2-Nitrophenol	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
3&4-Methylphenol (m&p-cresol)	ND	360	ug/Kg	1	10/06/22	WB	SW8270D
3,3'-Dichlorobenzidine	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
3-Nitroaniline	ND	300	ug/Kg	1	10/06/22	WB	SW8270D
4,6-Dinitro-2-methylphenol	ND	300	ug/Kg	1	10/06/22	WB	SW8270D
4-Bromophenyl phenyl ether	ND	360	ug/Kg	1	10/06/22	WB	SW8270D
4-Chloro-3-methylphenol	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
4-Chloroaniline	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
4-Nitroaniline	ND	300	ug/Kg	1	10/06/22	WB	SW8270D
4-Nitrophenol	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Acenaphthene	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Acenaphthylene	1300	250	ug/Kg	1	10/06/22	WB	SW8270D
Acetophenone	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Aniline	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
Anthracene	690	250	ug/Kg	1	10/06/22	WB	SW8270D
Benz(a)anthracene	1400	250	ug/Kg	1	10/06/22	WB	SW8270D
Benzidine	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
Benzo(a)pyrene	1900	250	ug/Kg	1	10/06/22	WB	SW8270D
Benzo(b)fluoranthene	1100	250	ug/Kg	1	10/06/22	WB	SW8270D
Benzo(ghi)perylene	1200	250	ug/Kg	1	10/06/22	WB	SW8270D
Benzo(k)fluoranthene	1300	250	ug/Kg	1	10/06/22	WB	SW8270D
Benzoic acid	ND	710	ug/Kg	1	10/06/22	WB	SW8270D
Benzyl butyl phthalate	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Bis(2-chloroethyl)ether	ND	360	ug/Kg	1	10/06/22	WB	SW8270D
Bis(2-ethylhexyl)phthalate	ND	360	ug/Kg	1	10/06/22	WB	SW8270D
Carbazole	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
Chrysene	1900	250	ug/Kg	1	10/06/22	WB	SW8270D
Dibenz(a,h)anthracene	270	250	ug/Kg	1	10/06/22	WB	SW8270D
Dibenzofuran	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
Diethyl phthalate	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Dimethylphthalate	ND	250	ug/Kg	1	10/06/22	WB	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Di-n-butylphthalate	ND	360	ug/Kg	1	10/06/22	WB	SW8270D
Di-n-octylphthalate	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Fluoranthene	2100	250	ug/Kg	1	10/06/22	WB	SW8270D
Fluorene	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Hexachlorobenzene	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Hexachlorobutadiene	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
Hexachlorocyclopentadiene	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Hexachloroethane	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Indeno(1,2,3-cd)pyrene	1100	250	ug/Kg	1	10/06/22	WB	SW8270D
Isophorone	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Naphthalene	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Nitrobenzene	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
N-Nitrosodimethylamine	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
N-Nitrosodi-n-propylamine	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
N-Nitrosodiphenylamine	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
Pentachloronitrobenzene	ND	140	ug/Kg	1	10/06/22	WB	SW8270D
Pentachlorophenol	ND	360	ug/Kg	1	10/06/22	WB	SW8270D
Phenanthrene	2000	250	ug/Kg	1	10/06/22	WB	SW8270D
Phenol	ND	250	ug/Kg	1	10/06/22	WB	SW8270D
Pyrene	3100	250	ug/Kg	1	10/06/22	WB	SW8270D
Pyridine	ND	200	ug/Kg	1	10/06/22	WB	SW8270D
QA/QC Surrogates							
% 2,4,6-Tribromophenol	87		%	1	10/06/22	WB	30 - 130 %
% 2-Fluorobiphenyl	75		%	1	10/06/22	WB	30 - 130 %
% 2-Fluorophenol	66		%	1	10/06/22	WB	30 - 130 %
% Nitrobenzene-d5	79		%	1	10/06/22	WB	30 - 130 %
% Phenol-d5	72		%	1	10/06/22	WB	30 - 130 %
% Terphenyl-d14	65		%	1	10/06/22	WB	30 - 130 %

SPLP Semivolatiles by SIM

2-Methylnaphthalene	ND	0.49	ug/L	1	10/21/22	WB	SW8270D (SIM)
Acenaphthene	ND	0.49	ug/L	1	10/21/22	WB	SW8270D (SIM)
Acenaphthylene	ND	0.29	ug/L	1	10/21/22	WB	SW8270D (SIM)
Anthracene	ND	0.49	ug/L	1	10/21/22	WB	SW8270D (SIM)
Benz(a)anthracene	ND	0.05	ug/L	1	10/21/22	WB	SW8270D (SIM)
Benzo(a)pyrene	ND	0.19	ug/L	1	10/21/22	WB	SW8270D (SIM)
Benzo(b)fluoranthene	ND	0.07	ug/L	1	10/21/22	WB	SW8270D (SIM)
Benzo(ghi)perylene	ND	0.47	ug/L	1	10/21/22	WB	SW8270D (SIM)
Benzo(k)fluoranthene	ND	0.29	ug/L	1	10/21/22	WB	SW8270D (SIM)
Chrysene	ND	0.49	ug/L	1	10/21/22	WB	SW8270D (SIM)
Dibenz(a,h)anthracene	ND	0.10	ug/L	1	10/21/22	WB	SW8270D (SIM)
Fluoranthene	ND	0.49	ug/L	1	10/21/22	WB	SW8270D (SIM)
Fluorene	ND	0.49	ug/L	1	10/21/22	WB	SW8270D (SIM)
Indeno(1,2,3-cd)pyrene	ND	0.10	ug/L	1	10/21/22	WB	SW8270D (SIM)
Naphthalene	ND	0.49	ug/L	1	10/21/22	WB	SW8270D (SIM)
Phenanthrene	ND	0.06	ug/L	1	10/21/22	WB	SW8270D (SIM)
Pyrene	ND	0.49	ug/L	1	10/21/22	WB	SW8270D (SIM)
QA/QC Surrogates							
% 2-Fluorobiphenyl	75		%	1	10/21/22	WB	30 - 130 %
% Nitrobenzene-d5	84		%	1	10/21/22	WB	30 - 130 %

Project ID: SHUTTLE MEADOW PS
Client ID: B-2 (7-9)

Phoenix I.D.: CM45900

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Terphenyl-d14	62		%	1	10/21/22	WB	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Per 1.4.6 of EPA method 8270D, 1,2-Diphenylhydrazine is unstable and readily converts to Azobenzene. Azobenzene is used for the calibration of 1,2-Diphenylhydrazine.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
October 24, 2022
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

October 24, 2022

QA/QC Data

SDG I.D.: GCM45897

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 645849 (mg/kg), QC Sample No: CM45857 2X (CM45897, CM45898, CM45899, CM45900)													
Mercury - Soil	BRL	0.03	0.04	0.04	NC	101	93.6	7.6	93.8	84.9	10.0	70 - 130	30
Comment:													
Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.													
QA/QC Batch 644735 (mg/kg), QC Sample No: CM45825 (CM45897)													
ICP Metals - Soil													
Arsenic	BRL	0.67	3.12	3.25	NC	97.6	91.5	6.5	101			75 - 125	35
Barium	BRL	0.33	58.3	51.2	13.0	103	96.8	6.2	104			75 - 125	35
Cadmium	BRL	0.33	1.23	1.32	NC	104	93.3	10.8	98.4			75 - 125	35
Chromium	BRL	0.33	19.3	14.6	27.7	109	97.3	11.3	101			75 - 125	35
Lead	BRL	0.33	32.7	28.2	14.8	94.7	89.7	5.4	105			75 - 125	35
Selenium	BRL	1.3	<1.4	<1.3	NC	101	95.0	6.1	103			75 - 125	35
Silver	BRL	0.33	<0.34	<0.33	NC	88.8	83.9	5.7	97.8			75 - 125	35
Comment:													
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.													
QA/QC Batch 644752 (mg/kg), QC Sample No: CM45900 (CM45898, CM45899, CM45900)													
ICP Metals - Soil													
Arsenic	BRL	0.67	1.12	1.24	NC	93.4	97.0	3.8	102			75 - 125	35
Barium	BRL	0.33	37.1	40.4	8.50	104	101	2.9	115			75 - 125	35
Cadmium	BRL	0.33	4.13	5.63	30.7	103	105	1.9	111			75 - 125	35
Chromium	BRL	0.33	18.8	16.6	12.4	98.8	99.3	0.5	103			75 - 125	35
Lead	BRL	0.33	24.8	19.8	22.4	90.6	95.8	5.6	100			75 - 125	35
Selenium	BRL	1.3	<1.4	<1.5	NC	93.2	94.6	1.5	99.8			75 - 125	35
Silver	BRL	0.33	3.77	1.81	NC	84.6	87.4	3.3	90.2			75 - 125	35
Comment:													
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.													

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

October 24, 2022

QA/QC Data

SDG I.D.: GCM45897

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
QA/QC Batch 645216 (mg/Kg), QC Sample No: CM45899 (CM45897, CM45898, CM45899, CM45900)											
TPH by GC (Extractable Products) - Soil											
Ext. Petroleum H.C. (C9-C36)	ND	50	97	99	2.0	86	87	1.2	60 - 120	30	
% COD (surr)	83	%	98	53	59.6	90	84	6.9	50 - 150	30	r
% Terphenyl (surr)	89	%	95	67	34.6	102	78	26.7	50 - 150	30	r
Comment:											
Additional surrogate criteria: LCS acceptance range is 60-120% MS acceptance range 50-150%. The ETPH/DRO LCS has been normalized based on the alkane calibration.											
QA/QC Batch 644739 (ug/Kg), QC Sample No: CM45876 2X (CM45897, CM45899)											
Polychlorinated Biphenyls - Soil											
PCB-1016	ND	33	75	75	0.0	53	53	0.0	40 - 140	30	
PCB-1221	ND	33							40 - 140	30	
PCB-1232	ND	33							40 - 140	30	
PCB-1242	ND	33							40 - 140	30	
PCB-1248	ND	33							40 - 140	30	
PCB-1254	ND	33							40 - 140	30	
PCB-1260	ND	33	89	82	8.2	46	57	21.4	40 - 140	30	
PCB-1262	ND	33							40 - 140	30	
PCB-1268	ND	33							40 - 140	30	
% DCBP (Surrogate Rec)	83	%	86	86	0.0	42	41	2.4	30 - 150	30	
% DCBP (Surrogate Rec) (Confirm	85	%	86	88	2.3	41	41	0.0	30 - 150	30	
% TCMX (Surrogate Rec)	70	%	72	73	1.4	47	43	8.9	30 - 150	30	
% TCMX (Surrogate Rec) (Confirm	72	%	73	74	1.4	47	48	2.1	30 - 150	30	
QA/QC Batch 647895 (ug/L), QC Sample No: CM37364 (CM45897, CM45899)											
Pesticides											
4,4' -DDD	ND	0.003	100	102	2.0				40 - 140	20	
4,4' -DDE	ND	0.003	87	93	6.7				40 - 140	20	
4,4' -DDT	ND	0.003	77	79	2.6				40 - 140	20	
a-BHC	ND	0.002	77	87	12.2				40 - 140	20	
Alachlor	ND	0.005	NA	NA	NC				40 - 140	20	
Aldrin	ND	0.002	77	85	9.9				40 - 140	20	
b-BHC	ND	0.002	96	151	44.5				40 - 140	20	l,r
Chlordane	ND	0.050	84	93	10.2				40 - 140	20	
d-BHC	ND	0.005	29	37	24.2				40 - 140	20	l,r
Dieldrin	ND	0.002	87	86	1.2				40 - 140	20	
Endosulfan I	ND	0.005	94	101	7.2				40 - 140	20	
Endosulfan II	ND	0.005	83	92	10.3				40 - 140	20	
Endosulfan sulfate	ND	0.005	72	70	2.8				40 - 140	20	
Endrin	ND	0.005	102	109	6.6				40 - 140	20	
Endrin aldehyde	ND	0.005	76	81	6.4				40 - 140	20	
Endrin ketone	ND	0.005	84	87	3.5				40 - 140	20	
g-BHC	ND	0.002	100	100	0.0				40 - 140	20	

QA/QC Data

SDG I.D.: GCM45897

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
Heptachlor	ND	0.005	90	99	9.5				40 - 140	20	
Heptachlor epoxide	ND	0.005	85	91	6.8				40 - 140	20	
Methoxychlor	ND	0.005	113	111	1.8				40 - 140	20	
Toxaphene	ND	0.20	NA	NA	NC				40 - 140	20	
% DCBP	68	%	74	72	2.7				30 - 150	20	
% DCBP (Confirmation)	110	%	118	106	10.7				30 - 150	20	
% TCMX	67	%	79	82	3.7				30 - 150	20	
% TCMX (Confirmation)	92	%	106	108	1.9				30 - 150	20	

Comment:

A LCS and LCS duplicate were performed instead of a MS and MSD. Alpha and gamma chlordane were spiked and analyzed instead of technical chlordane. Gamma chlordane recovery is reported as chlordane in the LCS and LCSD

QA/QC Batch 644743 (ug/Kg), QC Sample No: CM45876 2X (CM45897, CM45899)

Pesticides - Soil

4,4' -DDD	ND	1.7	76	83	8.8	80	89	10.7	40 - 140	30	
4,4' -DDE	ND	1.7	79	84	6.1	71	77	8.1	40 - 140	30	
4,4' -DDT	ND	1.7	77	82	6.3	79	83	4.9	40 - 140	30	
a-BHC	ND	1.0	84	79	6.1	64	70	9.0	40 - 140	30	
Alachlor	ND	3.3	NA	NA	NC	NA	NA	NC	40 - 140	30	
Aldrin	ND	1.0	86	87	1.2	68	75	9.8	40 - 140	30	
b-BHC	ND	1.0	81	83	2.4	77	80	3.8	40 - 140	30	
Chlordane	ND	33	78	82	5.0	66	71	7.3	40 - 140	30	
d-BHC	ND	3.3	64	66	3.1	57	56	1.8	40 - 140	30	
Dieldrin	ND	1.0	79	85	7.3	70	76	8.2	40 - 140	30	
Endosulfan I	ND	3.3	85	79	7.3	81	82	1.2	40 - 140	30	
Endosulfan II	ND	3.3	78	74	5.3	78	82	5.0	40 - 140	30	
Endosulfan sulfate	ND	3.3	82	89	8.2	70	73	4.2	40 - 140	30	
Endrin	ND	3.3	84	89	5.8	70	75	6.9	40 - 140	30	
Endrin aldehyde	ND	3.3	71	72	1.4	55	59	7.0	40 - 140	30	
Endrin ketone	ND	3.3	86	95	9.9	78	87	10.9	40 - 140	30	
g-BHC	ND	1.0	88	88	0.0	82	88	7.1	40 - 140	30	
Heptachlor	ND	3.3	87	87	0.0	70	76	8.2	40 - 140	30	
Heptachlor epoxide	ND	3.3	86	90	4.5	70	76	8.2	40 - 140	30	
Methoxychlor	ND	3.3	87	98	11.9	82	92	11.5	40 - 140	30	
Toxaphene	ND	130	NA	NA	NC	NA	NA	NC	40 - 140	30	
% DCBP	92	%	88	93	5.5	79	86	8.5	30 - 150	30	
% DCBP (Confirmation)	66	%	65	69	6.0	104	112	7.4	30 - 150	30	
% TCMX	74	%	80	75	6.5	70	73	4.2	30 - 150	30	
% TCMX (Confirmation)	62	%	68	64	6.1	83	89	7.0	30 - 150	30	

QA/QC Batch 645470 (ug/kg), QC Sample No: CM45261 (CM45900)

Semivolatiles - Soil

1,2,4,5-Tetrachlorobenzene	ND	230	69	63	9.1	70	60	15.4	40 - 140	30	
1,2,4-Trichlorobenzene	ND	230	64	51	22.6	65	55	16.7	40 - 140	30	
1,2-Dichlorobenzene	ND	180	59	40	38.4	60	49	20.2	40 - 140	30	r
1,2-Diphenylhydrazine	ND	230	73	75	2.7	77	69	11.0	40 - 140	30	
1,3-Dichlorobenzene	ND	230	56	34	48.9	57	45	23.5	40 - 140	30	l,r
1,4-Dichlorobenzene	ND	230	57	37	42.6	58	47	21.0	40 - 140	30	l,r
2,2'-Oxybis(1-Chloropropane)	ND	230	66	48	31.6	65	55	16.7	40 - 140	30	r
2,4,5-Trichlorophenol	ND	230	76	77	1.3	80	69	14.8	40 - 140	30	
2,4,6-Trichlorophenol	ND	130	78	78	0.0	80	68	16.2	30 - 130	30	
2,4-Dichlorophenol	ND	130	78	74	5.3	77	68	12.4	30 - 130	30	
2,4-Dimethylphenol	ND	230	77	73	5.3	58	53	9.0	30 - 130	30	
2,4-Dinitrophenol	ND	230	11	11	0.0	43	29	38.9	30 - 130	30	l,m,r

QA/QC Data

SDG I.D.: GCM45897

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
2,4-Dinitrotoluene	ND	130	82	84	2.4	84	72	15.4	30 - 130	30	
2,6-Dinitrotoluene	ND	130	76	78	2.6	78	68	13.7	40 - 140	30	
2-Chloronaphthalene	ND	230	71	68	4.3	76	66	14.1	40 - 140	30	
2-Chlorophenol	ND	230	72	56	25.0	71	61	15.2	30 - 130	30	
2-Methylnaphthalene	ND	230	71	65	8.8	73	62	16.3	40 - 140	30	
2-Methylphenol (o-cresol)	ND	230	74	66	11.4	69	61	12.3	40 - 140	30	
2-Nitroaniline	ND	330	108	112	3.6	103	88	15.7	40 - 140	30	
2-Nitrophenol	ND	230	75	62	19.0	76	59	25.2	40 - 140	30	
3&4-Methylphenol (m&p-cresol)	ND	230	79	72	9.3	74	69	7.0	30 - 130	30	
3,3'-Dichlorobenzidine	ND	130	77	75	2.6	67	63	6.2	40 - 140	30	
3-Nitroaniline	ND	330	87	86	1.2	82	69	17.2	40 - 140	30	
4,6-Dinitro-2-methylphenol	ND	230	14	18	25.0	56	44	24.0	30 - 130	30	l
4-Bromophenyl phenyl ether	ND	230	74	75	1.3	83	67	21.3	40 - 140	30	
4-Chloro-3-methylphenol	ND	230	85	83	2.4	83	74	11.5	30 - 130	30	
4-Chloroaniline	ND	230	79	73	7.9	73	70	4.2	40 - 140	30	
4-Chlorophenyl phenyl ether	ND	230	74	75	1.3	78	68	13.7	40 - 140	30	
4-Nitroaniline	ND	230	87	85	2.3	91	79	14.1	40 - 140	30	
4-Nitrophenol	ND	230	72	76	5.4	73	75	2.7	30 - 130	30	
Acenaphthene	ND	230	73	72	1.4	77	68	12.4	30 - 130	30	
Acenaphthylene	ND	130	70	70	0.0	72	64	11.8	40 - 140	30	
Acetophenone	ND	230	72	58	21.5	73	62	16.3	40 - 140	30	
Aniline	ND	330	64	47	30.6	56	47	17.5	40 - 140	30	r
Anthracene	ND	230	75	76	1.3	81	71	13.2	40 - 140	30	
Benz(a)anthracene	ND	230	75	77	2.6	81	69	16.0	40 - 140	30	
Benzidine	ND	330	79	61	25.7	<10	<10	NC	40 - 140	30	m
Benzo(a)pyrene	ND	130	81	85	4.8	87	75	14.8	40 - 140	30	
Benzo(b)fluoranthene	ND	160	77	80	3.8	79	68	15.0	40 - 140	30	
Benzo(ghi)perylene	ND	230	76	79	3.9	80	71	11.9	40 - 140	30	
Benzo(k)fluoranthene	ND	230	67	70	4.4	76	67	12.6	40 - 140	30	
Benzoic Acid	ND	670	<10	<10	NC	<10	<10	NC	30 - 130	30	l,m
Benzyl butyl phthalate	ND	230	89	92	3.3	96	82	15.7	40 - 140	30	
Bis(2-chloroethoxy)methane	ND	230	72	63	13.3	73	63	14.7	40 - 140	30	
Bis(2-chloroethyl)ether	ND	130	62	44	34.0	63	51	21.1	40 - 140	30	r
Bis(2-ethylhexyl)phthalate	ND	230	91	96	5.3	101	87	14.9	40 - 140	30	
Carbazole	ND	230	76	78	2.6	82	70	15.8	40 - 140	30	
Chrysene	ND	230	77	81	5.1	84	74	12.7	40 - 140	30	
Dibenz(a,h)anthracene	ND	130	74	78	5.3	82	69	17.2	40 - 140	30	
Dibenzofuran	ND	230	73	74	1.4	76	68	11.1	40 - 140	30	
Diethyl phthalate	ND	230	76	81	6.4	82	71	14.4	40 - 140	30	
Dimethylphthalate	ND	230	77	77	0.0	80	70	13.3	40 - 140	30	
Di-n-butylphthalate	ND	670	80	85	6.1	87	75	14.8	40 - 140	30	
Di-n-octylphthalate	ND	230	94	99	5.2	99	88	11.8	40 - 140	30	
Fluoranthene	ND	230	73	77	5.3	76	70	8.2	40 - 140	30	
Fluorene	ND	230	74	76	2.7	76	70	8.2	40 - 140	30	
Hexachlorobenzene	ND	130	78	80	2.5	87	74	16.1	40 - 140	30	
Hexachlorobutadiene	ND	230	67	50	29.1	70	58	18.8	40 - 140	30	
Hexachlorocyclopentadiene	ND	230	57	45	23.5	62	43	36.2	40 - 140	30	r
Hexachloroethane	ND	130	60	38	44.9	61	49	21.8	40 - 140	30	l,r
Indeno(1,2,3-cd)pyrene	ND	230	81	86	6.0	86	76	12.3	40 - 140	30	
Isophorone	ND	130	65	58	11.4	67	56	17.9	40 - 140	30	
Naphthalene	ND	230	65	53	20.3	66	58	12.9	40 - 140	30	
Nitrobenzene	ND	130	70	55	24.0	70	59	17.1	40 - 140	30	
N-Nitrosodimethylamine	ND	230	59	35	51.1	60	43	33.0	40 - 140	30	l,r

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
N-Nitrosodi-n-propylamine	ND	130	72	61	16.5	74	65	12.9	40 - 140	30	
N-Nitrosodiphenylamine	ND	130	72	74	2.7	71	65	8.8	40 - 140	30	
Pentachloronitrobenzene	ND	230	80	83	3.7	87	74	16.1	40 - 140	30	
Pentachlorophenol	ND	230	55	53	3.7	53	33	46.5	30 - 130	30	r
Phenanthrene	ND	130	73	73	0.0	80	71	11.9	40 - 140	30	
Phenol	ND	230	71	62	13.5	70	64	9.0	30 - 130	30	
Pyrene	ND	230	69	74	7.0	75	70	6.9	30 - 130	30	
Pyridine	ND	230	44	26	51.4	46	36	24.4	40 - 140	30	l,m,r
% 2,4,6-Tribromophenol	96	%	78	81	3.8	83	71	15.6	30 - 130	30	
% 2-Fluorobiphenyl	76	%	66	64	3.1	73	62	16.3	30 - 130	30	
% 2-Fluorophenol	68	%	68	51	28.6	69	55	22.6	30 - 130	30	
% Nitrobenzene-d5	81	%	69	56	20.8	69	60	14.0	30 - 130	30	
% Phenol-d5	75	%	71	62	13.5	73	62	16.3	30 - 130	30	
% Terphenyl-d14	81	%	68	75	9.8	74	68	8.5	30 - 130	30	

Comment:

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

QA/QC Batch 645272 (ug/kg), QC Sample No: CM46690 (CM45897, CM45899)

Semivolatiles - Soil

1,2,4,5-Tetrachlorobenzene	ND	230	60	76	23.5	75	69	8.3	40 - 140	30	
1,2,4-Trichlorobenzene	ND	230	58	71	20.2	73	64	13.1	40 - 140	30	
1,2-Dichlorobenzene	ND	180	52	69	28.1	69	59	15.6	40 - 140	30	
1,2-Diphenylhydrazine	ND	230	69	84	19.6	84	79	6.1	40 - 140	30	
1,3-Dichlorobenzene	ND	230	51	67	27.1	67	56	17.9	40 - 140	30	
1,4-Dichlorobenzene	ND	230	51	69	30.0	69	57	19.0	40 - 140	30	
2,2'-Oxybis(1-Chloropropane)	ND	230	62	81	26.6	80	69	14.8	40 - 140	30	
2,4,5-Trichlorophenol	ND	230	75	90	18.2	91	87	4.5	40 - 140	30	
2,4,6-Trichlorophenol	ND	130	74	89	18.4	90	86	4.5	30 - 130	30	
2,4-Dichlorophenol	ND	130	68	86	23.4	85	80	6.1	30 - 130	30	
2,4-Dimethylphenol	ND	230	66	83	22.8	85	77	9.9	30 - 130	30	
2,4-Dinitrophenol	ND	230	75	90	18.2	91	87	4.5	30 - 130	30	
2,4-Dinitrotoluene	ND	130	84	98	15.4	100	96	4.1	30 - 130	30	
2,6-Dinitrotoluene	ND	130	76	91	18.0	93	89	4.4	40 - 140	30	
2-Chloronaphthalene	ND	230	66	82	21.6	84	76	10.0	40 - 140	30	
2-Chlorophenol	ND	230	64	86	29.3	85	74	13.8	30 - 130	30	
2-Methylnaphthalene	ND	230	64	79	21.0	80	72	10.5	40 - 140	30	
2-Methylphenol (o-cresol)	ND	230	66	87	27.5	85	76	11.2	40 - 140	30	
2-Nitroaniline	ND	330	129	143	10.3	141	140	0.7	40 - 140	30	l,m
2-Nitrophenol	ND	230	65	81	21.9	82	73	11.6	40 - 140	30	
3&4-Methylphenol (m&p-cresol)	ND	230	72	96	28.6	93	83	11.4	30 - 130	30	
3,3'-Dichlorobenzidine	ND	130	103	111	7.5	103	92	11.3	40 - 140	30	
3-Nitroaniline	ND	330	94	110	15.7	106	96	9.9	40 - 140	30	
4,6-Dinitro-2-methylphenol	ND	230	76	90	16.9	91	88	3.4	30 - 130	30	
4-Bromophenyl phenyl ether	ND	230	72	84	15.4	86	83	3.6	40 - 140	30	
4-Chloro-3-methylphenol	ND	230	74	90	19.5	90	86	4.5	30 - 130	30	
4-Chloroaniline	ND	230	69	78	12.2	73	61	17.9	40 - 140	30	
4-Chlorophenyl phenyl ether	ND	230	72	87	18.9	88	83	5.8	40 - 140	30	
4-Nitroaniline	ND	230	76	93	20.1	93	89	4.4	40 - 140	30	
4-Nitrophenol	ND	230	87	101	14.9	101	100	1.0	30 - 130	30	
Acenaphthene	ND	230	68	83	19.9	85	79	7.3	30 - 130	30	
Acenaphthylene	ND	130	63	77	20.0	78	73	6.6	40 - 140	30	
Acetophenone	ND	230	60	79	27.3	78	67	15.2	40 - 140	30	

QA/QC Data

SDG I.D.: GCM45897

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
Aniline	ND	330	58	64	9.8	54	48	11.8	40 - 140	30	
Anthracene	ND	230	75	86	13.7	87	85	2.3	40 - 140	30	
Benz(a)anthracene	ND	230	78	87	10.9	87	86	1.2	40 - 140	30	
Benzidine	ND	330	59	25	81.0	<10	22	NC	40 - 140	30	l,m,r
Benzo(a)pyrene	ND	130	86	97	12.0	99	95	4.1	40 - 140	30	
Benzo(b)fluoranthene	ND	160	78	89	13.2	92	88	4.4	40 - 140	30	
Benzo(ghi)perylene	ND	230	80	89	10.7	90	88	2.2	40 - 140	30	
Benzo(k)fluoranthene	ND	230	77	88	13.3	89	83	7.0	40 - 140	30	
Benzoic Acid	ND	670	75	96	24.6	93	84	10.2	30 - 130	30	
Benzyl butyl phthalate	ND	230	86	97	12.0	99	97	2.0	40 - 140	30	
Bis(2-chloroethoxy)methane	ND	230	64	80	22.2	81	73	10.4	40 - 140	30	
Bis(2-chloroethyl)ether	ND	130	58	76	26.9	75	64	15.8	40 - 140	30	
Bis(2-ethylhexyl)phthalate	ND	230	88	98	10.8	99	97	2.0	40 - 140	30	
Carbazole	ND	230	79	87	9.6	89	88	1.1	40 - 140	30	
Chrysene	ND	230	82	92	11.5	92	90	2.2	40 - 140	30	
Dibenz(a,h)anthracene	ND	130	80	89	10.7	92	89	3.3	40 - 140	30	
Dibenzofuran	ND	230	69	84	19.6	85	79	7.3	40 - 140	30	
Diethyl phthalate	ND	230	76	91	18.0	92	87	5.6	40 - 140	30	
Dimethylphthalate	ND	230	73	87	17.5	88	84	4.7	40 - 140	30	
Di-n-butylphthalate	ND	670	83	93	11.4	95	91	4.3	40 - 140	30	
Di-n-octylphthalate	ND	230	90	99	9.5	101	99	2.0	40 - 140	30	
Fluoranthene	ND	230	80	90	11.8	93	89	4.4	40 - 140	30	
Fluorene	ND	230	72	88	20.0	88	82	7.1	40 - 140	30	
Hexachlorobenzene	ND	130	73	86	16.4	86	84	2.4	40 - 140	30	
Hexachlorobutadiene	ND	230	58	71	20.2	73	65	11.6	40 - 140	30	
Hexachlorocyclopentadiene	ND	230	57	73	24.6	74	66	11.4	40 - 140	30	
Hexachloroethane	ND	130	52	69	28.1	69	58	17.3	40 - 140	30	
Indeno(1,2,3-cd)pyrene	ND	230	86	96	11.0	99	95	4.1	40 - 140	30	
Isophorone	ND	130	59	74	22.6	74	67	9.9	40 - 140	30	
Naphthalene	ND	230	58	73	22.9	73	65	11.6	40 - 140	30	
Nitrobenzene	ND	130	62	82	27.8	81	70	14.6	40 - 140	30	
N-Nitrosodimethylamine	ND	230	52	71	30.9	72	56	25.0	40 - 140	30	r
N-Nitrosodi-n-propylamine	ND	130	63	83	27.4	82	71	14.4	40 - 140	30	
N-Nitrosodiphenylamine	ND	130	74	87	16.1	87	84	3.5	40 - 140	30	
Pentachloronitrobenzene	ND	230	75	86	13.7	87	86	1.2	40 - 140	30	
Pentachlorophenol	ND	230	84	94	11.2	95	93	2.1	30 - 130	30	
Phenanthrene	ND	130	73	84	14.0	87	83	4.7	40 - 140	30	
Phenol	ND	230	69	89	25.3	86	77	11.0	30 - 130	30	
Pyrene	ND	230	79	89	11.9	91	87	4.5	30 - 130	30	
Pyridine	ND	230	35	60	52.6	56	36	43.5	40 - 140	30	l,m,r
% 2,4,6-Tribromophenol	83	%	76	89	15.8	89	85	4.6	30 - 130	30	
% 2-Fluorobiphenyl	73	%	60	77	24.8	76	68	11.1	30 - 130	30	
% 2-Fluorophenol	78	%	60	84	33.3	80	67	17.7	30 - 130	30	r
% Nitrobenzene-d5	73	%	56	77	31.6	74	63	16.1	30 - 130	30	r
% Phenol-d5	80	%	65	87	28.9	84	72	15.4	30 - 130	30	
% Terphenyl-d14	84	%	74	88	17.3	87	82	5.9	30 - 130	30	

Comment:

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

QA/QC Batch 645213 (ug/kg), QC Sample No: CM47189 (CM45898)

Semivolatiles - Soil

1,2,4,5-Tetrachlorobenzene	ND	230	48			65	71	8.8	40 - 140	30	

QA/QC Data

SDG I.D.: GCM45897

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
1,2,4-Trichlorobenzene	ND	230	43			52	66	23.7	40 - 140	30	
1,2-Dichlorobenzene	ND	180	40			38	62	48.0	40 - 140	30	m,r
1,2-Diphenylhydrazine	ND	230	51			79	78	1.3	40 - 140	30	
1,3-Dichlorobenzene	ND	230	38			32	60	60.9	40 - 140	30	l,m,r
1,4-Dichlorobenzene	ND	230	39			33	60	58.1	40 - 140	30	l,m,r
2,2'-Oxybis(1-Chloropropane)	ND	230	42			52	72	32.3	40 - 140	30	r
2,4,5-Trichlorophenol	ND	230	62			90	89	1.1	40 - 140	30	
2,4,6-Trichlorophenol	ND	130	60			84	86	2.4	30 - 130	30	
2,4-Dichlorophenol	ND	130	54			76	81	6.4	30 - 130	30	
2,4-Dimethylphenol	ND	230	54			73	76	4.0	30 - 130	30	
2,4-Dinitrophenol	ND	230	47			94	89	5.5	30 - 130	30	
2,4-Dinitrotoluene	ND	130	63			98	93	5.2	30 - 130	30	
2,6-Dinitrotoluene	ND	130	61			92	92	0.0	40 - 140	30	
2-Chloronaphthalene	ND	230	51			70	77	9.5	40 - 140	30	
2-Chlorophenol	ND	230	48			69	79	13.5	30 - 130	30	
2-Methylnaphthalene	ND	230	47			64	73	13.1	40 - 140	30	
2-Methylphenol (o-cresol)	ND	230	49			71	78	9.4	40 - 140	30	
2-Nitroaniline	ND	330	81			125	117	6.6	40 - 140	30	
2-Nitrophenol	ND	230	62			86	108	22.7	40 - 140	30	
3&4-Methylphenol (m&p-cresol)	ND	230	54			76	81	6.4	30 - 130	30	
3,3'-Dichlorobenzidine	ND	130	61			62	61	1.6	40 - 140	30	
3-Nitroaniline	ND	330	64			99	95	4.1	40 - 140	30	
4,6-Dinitro-2-methylphenol	ND	230	60			95	92	3.2	30 - 130	30	
4-Bromophenyl phenyl ether	ND	230	57			89	81	9.4	40 - 140	30	
4-Chloro-3-methylphenol	ND	230	59			88	86	2.3	30 - 130	30	
4-Chloroaniline	ND	230	51			74	75	1.3	40 - 140	30	
4-Chlorophenyl phenyl ether	ND	230	56			85	81	4.8	40 - 140	30	
4-Nitroaniline	ND	230	59			88	91	3.4	40 - 140	30	
4-Nitrophenol	ND	230	82			130	122	6.3	30 - 130	30	
Acenaphthene	ND	230	53			76	79	3.9	30 - 130	30	
Acenaphthylene	ND	130	51			72	75	4.1	40 - 140	30	
Acetophenone	ND	230	44			64	74	14.5	40 - 140	30	
Aniline	ND	330	41			40	47	16.1	40 - 140	30	
Anthracene	ND	230	57			91	81	11.6	40 - 140	30	
Benz(a)anthracene	ND	230	56			90	80	11.8	40 - 140	30	
Benzidine	ND	330	56			<10	<10	NC	40 - 140	30	m
Benzo(a)pyrene	ND	130	63			100	90	10.5	40 - 140	30	
Benzo(b)fluoranthene	ND	160	58			93	83	11.4	40 - 140	30	
Benzo(ghi)perylene	ND	230	56			89	81	9.4	40 - 140	30	
Benzo(k)fluoranthene	ND	230	56			89	82	8.2	40 - 140	30	
Benzoic Acid	ND	670	38			85	80	6.1	30 - 130	30	
Benzyl butyl phthalate	ND	230	61			96	88	8.7	40 - 140	30	
Bis(2-chloroethoxy)methane	ND	230	48			70	75	6.9	40 - 140	30	
Bis(2-chloroethyl)ether	ND	130	42			54	68	23.0	40 - 140	30	
Bis(2-ethylhexyl)phthalate	ND	230	59			96	88	8.7	40 - 140	30	
Carbazole	ND	230	56			90	80	11.8	40 - 140	30	
Chrysene	ND	230	58			93	84	10.2	40 - 140	30	
Dibenz(a,h)anthracene	ND	130	57			91	82	10.4	40 - 140	30	
Dibenzofuran	ND	230	53			78	78	0.0	40 - 140	30	
Diethyl phthalate	ND	230	57			89	83	7.0	40 - 140	30	
Dimethylphthalate	ND	230	57			87	82	5.9	40 - 140	30	
Di-n-butylphthalate	ND	670	60			96	87	9.8	40 - 140	30	
Di-n-octylphthalate	ND	230	62			100	91	9.4	40 - 140	30	

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
Fluoranthene	ND	230	59			96	84	13.3	40 - 140	30	
Fluorene	ND	230	55			85	80	6.1	40 - 140	30	
Hexachlorobenzene	ND	130	56			89	82	8.2	40 - 140	30	
Hexachlorobutadiene	ND	230	43			46	66	35.7	40 - 140	30	r
Hexachlorocyclopentadiene	ND	230	43			50	67	29.1	40 - 140	30	
Hexachloroethane	ND	130	38			30	60	66.7	40 - 140	30	l,m,r
Indeno(1,2,3-cd)pyrene	ND	230	61			96	88	8.7	40 - 140	30	
Isophorone	ND	130	45			66	69	4.4	40 - 140	30	
Naphthalene	ND	230	43			57	69	19.0	40 - 140	30	
Nitrobenzene	ND	130	50			66	87	27.5	40 - 140	30	
N-Nitrosodimethylamine	ND	230	40			64	68	6.1	40 - 140	30	
N-Nitrosodi-n-propylamine	ND	130	46			65	76	15.6	40 - 140	30	
N-Nitrosodiphenylamine	ND	130	56			82	75	8.9	40 - 140	30	
Pentachloronitrobenzene	ND	230	61			98	91	7.4	40 - 140	30	
Pentachlorophenol	ND	230	64			102	90	12.5	30 - 130	30	
Phenanthrene	ND	130	55			88	79	10.8	40 - 140	30	
Phenol	ND	230	50			77	81	5.1	30 - 130	30	
Pyrene	ND	230	57			95	83	13.5	30 - 130	30	
Pyridine	ND	230	33			41	50	19.8	40 - 140	30	l
% 2,4,6-Tribromophenol	43	%	129			98	92	6.3	30 - 130	30	
% 2-Fluorobiphenyl	34	%	95			65	67	3.0	30 - 130	30	
% 2-Fluorophenol	29	%	91			66	70	5.9	30 - 130	30	s
% Nitrobenzene-d5	22	%	92			60	75	22.2	30 - 130	30	s
% Phenol-d5	35	%	99			75	74	1.3	30 - 130	30	
% Terphenyl-d14	69	%	111			90	74	19.5	30 - 130	30	

Comment:

This batch consists of a Blank, LCS, MS and MSD.

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

QA/QC Batch 648033 (ug/L), QC Sample No: CM66608 (CM45899, CM45900)

Semivolatiles by SIM, PAH - SPLP

2-Methylnaphthalene	ND	0.50	87	98	11.9				30 - 130	20
Acenaphthene	ND	0.50	72	78	8.0				30 - 130	20
Acenaphthylene	ND	0.10	61	67	9.4				30 - 130	20
Anthracene	ND	0.10	70	76	8.2				30 - 130	20
Benz(a)anthracene	ND	0.05	95	96	1.0				30 - 130	20
Benzo(a)pyrene	ND	0.20	74	78	5.3				30 - 130	20
Benzo(b)fluoranthene	ND	0.07	80	86	7.2				30 - 130	20
Benzo(ghi)perylene	ND	0.02	80	86	7.2				30 - 130	20
Benzo(k)fluoranthene	ND	0.10	80	90	11.8				30 - 130	20
Chrysene	ND	0.05	76	80	5.1				30 - 130	20
Dibenz(a,h)anthracene	ND	0.02	80	86	7.2				30 - 130	20
Fluoranthene	ND	0.50	65	69	6.0				30 - 130	20
Fluorene	ND	0.10	74	81	9.0				30 - 130	20
Indeno(1,2,3-cd)pyrene	ND	0.10	82	87	5.9				30 - 130	20
Naphthalene	ND	0.50	82	97	16.8				30 - 130	20
Phenanthrene	ND	0.06	82	90	9.3				30 - 130	20
Pyrene	ND	0.07	76	81	6.4				30 - 130	20
% 2-Fluorobiphenyl	72	%	70	79	12.1				30 - 130	20
% Nitrobenzene-d5	79	%	91	92	1.1				30 - 130	20
% Terphenyl-d14	66	%	69	73	5.6				30 - 130	20

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
Comment:											
Additional 8270 criteria:20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)											
QA/QC Batch 645225 (ug/kg), QC Sample No: CM44877 (CM45899)											
Volatiles - Soil (Low Level)											
1,1,1,2-Tetrachloroethane	ND	5.0	110	111	0.9	105	106	0.9	70 - 130	30	
1,1,1-Trichloroethane	ND	5.0	98	100	2.0	98	101	3.0	70 - 130	30	
1,1,2,2-Tetrachloroethane	ND	3.0	103	103	0.0	103	104	1.0	70 - 130	30	
1,1,2-Trichloroethane	ND	5.0	99	99	0.0	100	97	3.0	70 - 130	30	
1,1-Dichloroethane	ND	5.0	93	98	5.2	95	97	2.1	70 - 130	30	
1,1-Dichloroethene	ND	5.0	96	99	3.1	91	94	3.2	70 - 130	30	
1,1-Dichloropropene	ND	5.0	98	102	4.0	100	99	1.0	70 - 130	30	
1,2,3-Trichlorobenzene	ND	5.0	109	107	1.9	88	86	2.3	70 - 130	30	
1,2,3-Trichloropropane	ND	5.0	95	102	7.1	104	104	0.0	70 - 130	30	
1,2,4-Trichlorobenzene	ND	5.0	107	104	2.8	84	84	0.0	70 - 130	30	
1,2,4-Trimethylbenzene	ND	1.0	102	105	2.9	97	99	2.0	70 - 130	30	
1,2-Dibromo-3-chloropropane	ND	5.0	111	111	0.0	102	105	2.9	70 - 130	30	
1,2-Dibromoethane	ND	5.0	105	107	1.9	104	103	1.0	70 - 130	30	
1,2-Dichlorobenzene	ND	5.0	104	106	1.9	96	95	1.0	70 - 130	30	
1,2-Dichloroethane	ND	5.0	99	101	2.0	99	99	0.0	70 - 130	30	
1,2-Dichloropropane	ND	5.0	97	98	1.0	101	99	2.0	70 - 130	30	
1,3,5-Trimethylbenzene	ND	1.0	104	107	2.8	100	101	1.0	70 - 130	30	
1,3-Dichlorobenzene	ND	5.0	102	103	1.0	93	94	1.1	70 - 130	30	
1,3-Dichloropropane	ND	5.0	100	101	1.0	102	100	2.0	70 - 130	30	
1,4-Dichlorobenzene	ND	5.0	103	104	1.0	94	94	0.0	70 - 130	30	
2,2-Dichloropropane	ND	5.0	107	111	3.7	102	105	2.9	70 - 130	30	
2-Chlorotoluene	ND	5.0	104	105	1.0	99	102	3.0	70 - 130	30	
2-Hexanone	ND	25	96	91	5.3	94	89	5.5	70 - 130	30	
2-Isopropyltoluene	ND	5.0	103	106	2.9	100	100	0.0	70 - 130	30	
4-Chlorotoluene	ND	5.0	103	107	3.8	99	101	2.0	70 - 130	30	
4-Methyl-2-pentanone	ND	25	96	95	1.0	98	96	2.1	70 - 130	30	
Acetone	ND	10	83	81	2.4	74	85	13.8	70 - 130	30	
Acrylonitrile	ND	5.0	94	94	0.0	89	89	0.0	70 - 130	30	
Benzene	ND	1.0	98	100	2.0	101	99	2.0	70 - 130	30	
Bromobenzene	ND	5.0	106	105	0.9	103	103	0.0	70 - 130	30	
Bromochloromethane	ND	5.0	97	100	3.0	96	96	0.0	70 - 130	30	
Bromodichloromethane	ND	5.0	105	106	0.9	101	101	0.0	70 - 130	30	
Bromoform	ND	5.0	115	113	1.8	103	103	0.0	70 - 130	30	
Bromomethane	ND	5.0	91	93	2.2	94	98	4.2	70 - 130	30	
Carbon Disulfide	ND	5.0	91	94	3.2	81	85	4.8	70 - 130	30	
Carbon tetrachloride	ND	5.0	95	114	18.2	92	94	2.2	70 - 130	30	
Chlorobenzene	ND	5.0	104	105	1.0	101	102	1.0	70 - 130	30	
Chloroethane	ND	5.0	99	102	3.0	95	95	0.0	70 - 130	30	
Chloroform	ND	5.0	97	99	2.0	97	98	1.0	70 - 130	30	
Chloromethane	ND	5.0	81	82	1.2	74	74	0.0	70 - 130	30	
cis-1,2-Dichloroethene	ND	5.0	95	99	4.1	95	98	3.1	70 - 130	30	
cis-1,3-Dichloropropene	ND	5.0	109	110	0.9	105	105	0.0	70 - 130	30	
Dibromochloromethane	ND	3.0	108	108	0.0	103	102	1.0	70 - 130	30	
Dibromomethane	ND	5.0	104	106	1.9	104	101	2.9	70 - 130	30	
Dichlorodifluoromethane	ND	5.0	70	73	4.2	60	60	0.0	70 - 130	30	m
Ethylbenzene	ND	1.0	105	107	1.9	106	108	1.9	70 - 130	30	
Hexachlorobutadiene	ND	5.0	99	104	4.9	84	85	1.2	70 - 130	30	

QA/QC Data

SDG I.D.: GCM45897

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
Isopropylbenzene	ND	1.0	104	107	2.8	103	105	1.9	70 - 130	30
m&p-Xylene	ND	2.0	102	105	2.9	105	108	2.8	70 - 130	30
Methyl ethyl ketone	ND	5.0	86	87	1.2	89	82	8.2	70 - 130	30
Methyl t-butyl ether (MTBE)	ND	1.0	78	79	1.3	76	77	1.3	70 - 130	30
Methylene chloride	ND	5.0	86	86	0.0	92	91	1.1	70 - 130	30
Naphthalene	ND	5.0	109	107	1.9	102	101	1.0	70 - 130	30
n-Butylbenzene	ND	1.0	107	109	1.9	95	98	3.1	70 - 130	30
n-Propylbenzene	ND	1.0	105	106	0.9	100	103	3.0	70 - 130	30
o-Xylene	ND	2.0	103	104	1.0	105	106	0.9	70 - 130	30
p-Isopropyltoluene	ND	1.0	104	106	1.9	98	100	2.0	70 - 130	30
sec-Butylbenzene	ND	1.0	103	106	2.9	100	101	1.0	70 - 130	30
Styrene	ND	5.0	107	108	0.9	102	103	1.0	70 - 130	30
tert-Butylbenzene	ND	1.0	102	107	4.8	102	103	1.0	70 - 130	30
Tetrachloroethene	ND	5.0	98	100	2.0	75	100	28.6	70 - 130	30
Tetrahydrofuran (THF)	ND	5.0	89	88	1.1	89	87	2.3	70 - 130	30
Toluene	ND	1.0	101	105	3.9	102	103	1.0	70 - 130	30
trans-1,2-Dichloroethene	ND	5.0	98	73	29.2	93	98	5.2	70 - 130	30
trans-1,3-Dichloropropene	ND	5.0	116	115	0.9	110	108	1.8	70 - 130	30
trans-1,4-dichloro-2-butene	ND	5.0	128	122	4.8	111	112	0.9	70 - 130	30
Trichloroethene	ND	5.0	99	102	3.0	98	100	2.0	70 - 130	30
Trichlorofluoromethane	ND	5.0	100	103	3.0	97	101	4.0	70 - 130	30
Trichlorotrifluoroethane	ND	5.0	89	94	5.5	88	91	3.4	70 - 130	30
Vinyl chloride	ND	5.0	94	96	2.1	90	91	1.1	70 - 130	30
% 1,2-dichlorobenzene-d4	94	%	100	99	1.0	100	101	1.0	70 - 130	30
% Bromofluorobenzene	99	%	99	100	1.0	100	98	2.0	70 - 130	30
% Dibromofluoromethane	96	%	93	96	3.2	95	96	1.0	70 - 130	30
% Toluene-d8	100	%	100	99	1.0	102	100	2.0	70 - 130	30

Comment:

Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%, 25-160% for Chloroethane-HL and Trichlorofluoromethane-HL.

l = This parameter is outside laboratory LCS/LCSD specified recovery limits.
m = This parameter is outside laboratory MS/MSD specified recovery limits.
r = This parameter is outside laboratory RPD specified recovery limits.
s = This parameter is outside laboratory Blank Surrogate specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
October 24, 2022

Monday, October 24, 2022

Criteria: CT: GAM, GBM, I/C, RC

State: CT

Sample Criteria Exceedances Report

GCM45897 - TIGHE-DAS

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
CM45897	$PEST_SMR	4,4' -DDT	CT / RSR GA,GAA (mg/kg) / APS Organics	9.3	7.1	3	3	ug/Kg
CM45899	$8270-SMR	Benzo(a)pyrene	CT / RSR DEC I/C (mg/kg) / Semivolatiles	4700	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Indeno(1,2,3-cd)pyrene	CT / RSR DEC RES (mg/kg) / APS Organics	3000	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Benz(a)anthracene	CT / RSR DEC RES (mg/kg) / Semivolatiles	5700	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Benzo(a)pyrene	CT / RSR DEC RES (mg/kg) / Semivolatiles	4700	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Benzo(b)fluoranthene	CT / RSR DEC RES (mg/kg) / Semivolatiles	4100	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Pyrene	CT / RSR GA (mg/kg) / Semivolatiles	16000	2500	4000	4000	ug/Kg
CM45899	$8270-SMR	Benz(a)anthracene	CT / RSR GA (mg/kg) / Semivolatiles	5700	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Benzo(a)pyrene	CT / RSR GA (mg/kg) / Semivolatiles	4700	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Benzo(b)fluoranthene	CT / RSR GA (mg/kg) / Semivolatiles	4100	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Benzo(k)fluoranthene	CT / RSR GA (mg/kg) / Semivolatiles	3800	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Fluoranthene	CT / RSR GA (mg/kg) / Semivolatiles	17000	2500	5600	5600	ug/Kg
CM45899	$8270-SMR	Phenanthrene	CT / RSR GA (mg/kg) / Semivolatiles	18000	2500	4000	4000	ug/Kg
CM45899	$8270-SMR	Dibenzofuran	CT / RSR GA,GAA (mg/kg) / APS Organics	740	250	200	200	ug/Kg
CM45899	$8270-SMR	Benzo(ghi)perylene	CT / RSR GA,GAA (mg/kg) / APS Organics	2400	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Carbazole	CT / RSR GA,GAA (mg/kg) / APS Organics	870	350	200	200	ug/Kg
CM45899	$8270-SMR	Chrysene	CT / RSR GA,GAA (mg/kg) / APS Organics	6100	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Indeno(1,2,3-cd)pyrene	CT / RSR GA,GAA (mg/kg) / APS Organics	3000	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Benzo(ghi)perylene	CT / RSR GB (mg/kg) / APS Organics	2400	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Chrysene	CT / RSR GB (mg/kg) / APS Organics	6100	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Indeno(1,2,3-cd)pyrene	CT / RSR GB (mg/kg) / APS Organics	3000	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Benzo(k)fluoranthene	CT / RSR GB (mg/kg) / Semivolatiles	3800	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Benz(a)anthracene	CT / RSR GB (mg/kg) / Semivolatiles	5700	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Benzo(a)pyrene	CT / RSR GB (mg/kg) / Semivolatiles	4700	250	1000	1000	ug/Kg
CM45899	$8270-SMR	Benzo(b)fluoranthene	CT / RSR GB (mg/kg) / Semivolatiles	4100	250	1000	1000	ug/Kg
CM45899	$PEST_SMR	4,4' -DDT	CT / RSR GA,GAA (mg/kg) / APS Organics	34	7.1	3	3	ug/Kg
CM45899	$PEST_SMR	4,4' -DDE	CT / RSR GA,GAA (mg/kg) / APS Organics	8.5	1.4	3	3	ug/Kg
CM45899	$PEST_SMR	4,4' -DDD	CT / RSR GA,GAA (mg/kg) / APS Organics	11	1.4	3	3	ug/Kg
CM45899	$PEST_SMR	4,4' -DDT	CT / RSR GB (mg/kg) / APS Organics	34	7.1	20	20	ug/Kg
CM45900	$8270-SMR	Benzo(a)pyrene	CT / RSR DEC I/C (mg/kg) / Semivolatiles	1900	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Indeno(1,2,3-cd)pyrene	CT / RSR DEC RES (mg/kg) / APS Organics	1100	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Benz(a)anthracene	CT / RSR DEC RES (mg/kg) / Semivolatiles	1400	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Benzo(a)pyrene	CT / RSR DEC RES (mg/kg) / Semivolatiles	1900	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Benzo(b)fluoranthene	CT / RSR DEC RES (mg/kg) / Semivolatiles	1100	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Benzo(k)fluoranthene	CT / RSR GA (mg/kg) / Semivolatiles	1300	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Benzo(a)pyrene	CT / RSR GA (mg/kg) / Semivolatiles	1900	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Benzo(b)fluoranthene	CT / RSR GA (mg/kg) / Semivolatiles	1100	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Benz(a)anthracene	CT / RSR GA (mg/kg) / Semivolatiles	1400	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Indeno(1,2,3-cd)pyrene	CT / RSR GA,GAA (mg/kg) / APS Organics	1100	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Benzo(ghi)perylene	CT / RSR GA,GAA (mg/kg) / APS Organics	1200	250	1000	1000	ug/Kg

Monday, October 24, 2022

Criteria: CT: GAM, GBM, I/C, RC

State: CT

Sample Criteria Exceedances Report

GCM45897 - TIGHE-DAS

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
CM45900	$8270-SMR	Chrysene	CT / RSR GA,GAA (mg/kg) / APS Organics	1900	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Indeno(1,2,3-cd)pyrene	CT / RSR GB (mg/kg) / APS Organics	1100	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Chrysene	CT / RSR GB (mg/kg) / APS Organics	1900	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Benzo(ghi)perylene	CT / RSR GB (mg/kg) / APS Organics	1200	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Benzo(k)fluoranthene	CT / RSR GB (mg/kg) / Semivolatiles	1300	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Benz(a)anthracene	CT / RSR GB (mg/kg) / Semivolatiles	1400	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Benzo(b)fluoranthene	CT / RSR GB (mg/kg) / Semivolatiles	1100	250	1000	1000	ug/Kg
CM45900	$8270-SMR	Benzo(a)pyrene	CT / RSR GB (mg/kg) / Semivolatiles	1900	250	1000	1000	ug/Kg

REASONABLE CONFIDENCE PROTOCOL
LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

Laboratory Name: Phoenix Environmental Labs, Inc. ***Client:*** Tighe & Bond

Project Location: SHUTTLE MEADOW PS ***Project Number:***

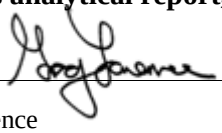
Laboratory Sample ID(s): CM45897-CM45900 ***Sampling Date(s):*** 9/29/2022

List RCP Methods Used (e.g., 8260, 8270, et cetera) 1311/1312, 6010, 7470/7471, 8081, 8082, 8260, 8270, ETPH

1	**For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?**	☑ Yes ☐ No
1A	**Were the method specified preservation and holding time requirements met?**	☐ Yes ☑ No
1B	***VPH and EPH methods only:*** **Was the VPH or EPH method conducted without significant modifications (see section 11.3 of respective RCP methods)**	☐ Yes ☐ No ☑ NA
2	**Were all samples received by the laboratory in a condition consistent with that described on the associated Chain-of-Custody document(s)?**	☑ Yes ☐ No
3	**Were samples received at an appropriate temperature (< 6 Degrees C)?**	☑ Yes ☐ No ☐ NA
4	**Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents acheived? See Sections: ETPH Narration, PEST Narration, SVOA Narration.**	☐ Yes ☑ No
5	**a) Were reporting limits specified or referenced on the chain-of-custody?** **b) Were these reporting limits met?**	☑ Yes ☐ No ☑ Yes ☐ No
6	**For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?**	☐ Yes ☑ No
7	**Are project-specific matrix spikes and laboratory duplicates included in the data set?**	☑ Yes ☐ No

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A or 1B is "No", the data package does not meet the requirements for "Reasonable Confidence". This form may not be altered and all questions must be answered.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.

Authorized Signature:  **Position:** Assistant Lab Director

Printed Name: Greg Lawrence **Date:** Monday, October 24, 2022

Name of Laboratory Phoenix Environmental Labs, Inc.

This certification form is to be used for RCP methods only.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

RCP Certification Report

October 24, 2022

SDG I.D.: GCM45897

SDG Comments

Metals Analysis:
The client requested a site specific list of elements which is shorter than the 6010 RCP list. The following analytes from the 6010 RCP Metals list were not reported: Antimony, Beryllium, Copper, Nickel, Thallium, Vanadium, Zinc.

SPLP Semi-volatile Organics: CM45899 and CM45900
Only the PAH constituents are reported as requested on the chain-of-custody. In order to achieve the requested reporting levels for the target compounds, the sample was extracted and analyzed via 8270 selective ion monitoring (SIM).

ETPH Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

QC Batch 645216 (Samples: CM45897, CM45898, CM45899, CM45900): -----

The LCS/LCSD RPD exceeds the method criteria for the surrogates. No significant variability is suspected. (% COD (surr), % Terphenyl (surr))

Instrument:

AU-FID1 10/05/22-1 Jeff Bucko, Chemist 10/05/22

CM45899 (5X)

The initial calibration (ET_908AI) RSD for the compound list was less than 30% except for the following compounds: None.
As per section 7.2.3, a discrimination check standard was run (O05A003_1) and contained the following outliers: None.
The continuing calibration %D for the compound list was less than 30% except for the following compounds:None.

AU-FID84 10/05/22-1 Jeff Bucko, Chemist 10/05/22

CM45897 (5X), CM45900 (5X)

The initial calibration (ET_908AI) RSD for the compound list was less than 30% except for the following compounds: None.
As per section 7.2.3, a discrimination check standard was run (O05A003_1) and contained the following outliers: None.
The continuing calibration %D for the compound list was less than 30% except for the following compounds:None.

AU-XL1 10/05/22-1 Jeff Bucko, Chemist 10/05/22

CM45898 (1X)

The initial calibration (ETPH721I) RSD for the compound list was less than 30% except for the following compounds: None.
As per section 7.2.3, a discrimination check standard was run (O05A003_1) and contained the following outliers: None.
The continuing calibration %D for the compound list was less than 30% except for the following compounds:None.

QC (Site Specific):

Batch 645216 (CM45899)

CM45897, CM45898, CM45899, CM45900

All LCS recoveries were within 60 - 120 with the following exceptions: None.
All LCSD recoveries were within 60 - 120 with the following exceptions: None.
All LCS/LCSD RPDs were less than 30% with the following exceptions: % COD (surr)(59.6%), % Terphenyl (surr)(34.6%)
All MS recoveries were within 50 - 150 with the following exceptions: None.
All MSD recoveries were within 50 - 150 with the following exceptions: None.
All MS/MSD RPDs were less than 30% with the following exceptions: None.
Additional surrogate criteria: LCS acceptance range is 60-120% MS acceptance range 50-150%. The ETPH/DRO LCS has been normalized based on the alkane calibration.

Mercury Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

Instrument:

MERLIN 10/10/22 12:15 Ian Enders, Chemist 10/10/22

CM45897, CM45898, CM45899, CM45900

The method preparation blank, ICB, and CCBs contain all of the acids and reagents as the samples.
The initial calibration met all criteria including a standard run at or below the reporting level.
All calibration verification standards (ICV, CCV) met criteria.
All calibration blank verification standards (ICB, CCB) met criteria.
The matrix spike sample is used to identify spectral interference for each batch of samples, if within 85-115%, no interference is observed and no further action is taken.
The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.
The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.

QC (Batch Specific):

Batch 645849 (CM45857)

CM45897, CM45898, CM45899, CM45900

All LCS recoveries were within 70 - 130 with the following exceptions: None.
All LCSD recoveries were within 70 - 130 with the following exceptions: None.
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.
Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.

ICP Metals Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

Instrument:

ARCOS-2 10/06/22 11:15 Tina Hall, Chemist 10/06/22

CM45897

The linear range is defined daily by the calibration range.
The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.
The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.
The following ICP Interference Check (ICSAB) compounds did not meet criteria: None.

ARCOS-2 10/11/22 07:36 Tina Hall, Chemist 10/11/22

CM45898, CM45899, CM45900

The linear range is defined daily by the calibration range.
The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.
The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.
The following ICP Interference Check (ICSAB) compounds did not meet criteria: None.

QC (Batch Specific):

Batch 644735 (CM45825)

CM45897

All LCS recoveries were within 75 - 125 with the following exceptions: None.
All LCSD recoveries were within 75 - 125 with the following exceptions: None.
All LCS/LCSD RPDs were less than 35% with the following exceptions: None.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

Certification Report

October 24, 2022

SDG I.D.: GCM45897

ICP Metals Narration

Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.

QC (Site Specific):

Batch 644752 (CM45900)

CM45898, CM45899, CM45900

All LCS recoveries were within 75 - 125 with the following exceptions: None.
All LCSD recoveries were within 75 - 125 with the following exceptions: None.
All LCS/LCSD RPDs were less than 35% with the following exceptions: None.
All MS recoveries were within 75 - 125 with the following exceptions: None.
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.

PCB Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

Instrument:

AU-ECD24 10/03/22-1 Saadia Chudary, Chemist 10/03/22

CM45897 (10X)

The initial calibration (PC930AI) RSD for the compound list was less than 20% except for the following compounds: None.
The initial calibration (PC930BI) RSD for the compound list was less than 20% except for the following compounds: None.
The continuing calibration %D for the compound list was less than 15% except for the following compounds:None.

AU-ECD5 10/03/22-1 Saadia Chudary, Chemist 10/03/22

CM45899 (10X)

The initial calibration (PC929AI) RSD for the compound list was less than 20% except for the following compounds: None.
The initial calibration (PC929BI) RSD for the compound list was less than 20% except for the following compounds: None.
The continuing calibration %D for the compound list was less than 15% except for the following compounds:
Samples: CM45899
Preceding CC O03B031 - DCBP SURR -19%L (15%), PCB 1260 -16%L (%)
Succeeding CC O03B044 - DCBP SURR -16%L (15%)

QC (Batch Specific):

Batch 644739 (CM45876)

CM45897, CM45899

All LCS recoveries were within 40 - 140 with the following exceptions: None.
All LCSD recoveries were within 40 - 140 with the following exceptions: None.
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

PEST Narration

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

RCP Certification Report

October 24, 2022

SDG I.D.: GCM45897

PEST Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

QC Batch 647895 (Samples: CM45897, CM45899): -----

The LCS/LCSD for one analyte is below the method criteria. A low bias for this analyte is possible. (d-BHC)

The LCSD recovery is above the upper range for one analyte that was not reported in the sample(s), therefore no significant bias is suspected. (b-BHC)

The LCS/LCSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in the sample(s) so no variability is suspected. (b-BHC, d-BHC)

Instrument:

AU-ECD6 10/03/22-1 Adam Werner, Chemist 10/03/22

CM45897 (2X), CM45899 (2X)

The initial calibration (PS0909AI) RSD for the compound list was less than 20% except for the following compounds: None.
The initial calibration (PS0909BI) RSD for the compound list was less than 20% except for the following compounds: None.
The Endrin and DDT breakdown does not exceed 15% except for the following compounds:None.
The Endrin and DDT breakdown does not exceed the maximum of 20% except for the following compounds:None.
The continuing calibration %D for the compound list was less than 20% except for the following compounds:
Samples: CM45899
Preceding CC O03A022 - None.
Succeeding CC O03A036 - Endosulfan sulfate 21%H (20%)
Samples: CM45897
Preceding CC O03A036 - Endosulfan sulfate 21%H (20%)
Succeeding CC O03A063 - None.
Samples: CM45897
Preceding CC O03B036 - None.
Succeeding CC O03B063 - Endosulfan II -21%L (20%)
A low "1A" standard was run after the samples to demonstrate capability to detect any compounds outside of the CC acceptance criteria. All reported samples were ND for the affected compounds.

AU-ECD6 10/21/22-1 Adam Werner, Chemist 10/21/22

CM45897 (1X), CM45899 (1X)

The initial calibration (PS0909AI) RSD for the compound list was less than 20% except for the following compounds: None.
The initial calibration (PS0909BI) RSD for the compound list was less than 20% except for the following compounds: None.
The Endrin and DDT breakdown does not exceed 15% except for the following compounds:None.
The Endrin and DDT breakdown does not exceed the maximum of 20% except for the following compounds:None.
The continuing calibration %D for the compound list was less than 20% except for the following compounds:
Samples: CM45897, CM45899
Preceding CC O21A051 - 4,4'-DDE -21%L (20%), Endrin Ketone 23%H (20%)
Succeeding CC O21A059 - 4,4'-DDE -23%L (20%), Endrin Ketone 23%H (20%)
A low "1A" standard was run after the samples to demonstrate capability to detect any compounds outside of the CC acceptance criteria. All reported samples were ND for the affected compounds.

QC (Batch Specific):

Batch 644743 (CM45876)

CM45897, CM45899

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

RCP Certification Report

October 24, 2022

SDG I.D.: GCM45897

PEST Narration

All LCS recoveries were within 40 - 140 with the following exceptions: None.
All LCSD recoveries were within 40 - 140 with the following exceptions: None.
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

Batch 647895 (CM37364)

CM45897, CM45899

All LCS recoveries were within 40 - 140 with the following exceptions: d-BHC(29%)
All LCSD recoveries were within 40 - 140 with the following exceptions: b-BHC(151%), d-BHC(37%)
All LCS/LCSD RPDs were less than 20% with the following exceptions: b-BHC(44.5%), d-BHC(24.2%)
A LCS and LCS duplicate were performed instead of a MS and MSD. Alpha and gamma chlordane were spiked and analyzed instead of technical chlordane. Gamma chlordane recovery is reported as chlordane in the LCS and LCSD

SVOA Narration

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

RCP Certification Report

October 24, 2022

SDG I.D.: GCM45897

SVOA Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

QC Batch 645213 (Samples: CM45898): -----

Several QC recoveries are below the lower range. A low bias is possible. (1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Hexachloroethane)

The blank surrogate(s) were below criteria. A low bias is possible. (% 2-Fluorophenol(CM47189), % Nitrobenzene-d5(CM47189))

The LCS recovery is below the lower range. All of the other QC is acceptable. No significant bias is suspected. (Pyridine)

QC Batch 645272 (Samples: CM45897, CM45899): -----

Several QC recoveries are below the lower range. A low bias is possible. (Benzidine, Pyridine)

The LCS/LCSD RPD exceeds the method criteria for one or more analytes and two surrogates. These analytes were not reported in the sample(s) so no significant variability is suspected. (Benzidine, N-Nitrosodimethylamine, Pyridine, % 2-Fluorophenol, % Nitrobenzene-d5)

The QC recovery for one analyte are above the upper range but was not reported in the sample(s). No significant bias is suspected. (2-Nitroaniline)

QC Batch 645470 (Samples: CM45900): -----

Several QC recoveries are below the lower range. A low bias is possible. (2,4-Dinitrophenol, Pyridine)

The LCS/LCSD is below the method criteria. A low bias for this analyte is possible. (4,6-Dinitro-2-methylphenol)

The LCSD recovery is below the method criteria. All of the other QC is acceptable, therefore no significant bias is suspected. (1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Hexachloroethane, N-Nitrosodimethylamine)

The LCS/LCSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in the sample(s) so no variability is suspected. (1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2,2''-Oxybis(1-Chloropropane), Aniline, Bis(2-chloroethyl)ether, Hexachloroethane, N-Nitrosodimethylamine, Pyridine)

The QC recoveries for one analyte is below the method criteria. A low bias is likely. (Benzoic Acid)

Instrument:

CHEM06 10/05/22-1 Wes Bryon, Chemist 10/05/22

CM45899 (10X)

For 8270 full list, the DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.
For 8270 BN list, benzidine peak tailing was evaluated in the DFTPP tune and was found to be in control.

Initial Calibration Evaluation (CHEM06/6_SPLIT_1004):
100% of target compounds met criteria.
The following compounds had %RSDs >20%: None.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

RCP Certification Report

October 24, 2022

SDG I.D.: GCM45897

SVOA Narration

The following compounds did not meet recommended response factors: None.
The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM06/1005_03-6_SPLIT_1004):
Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.
100% of target compounds met criteria.
The following compounds did not meet % deviation criteria: None.
The following compounds did not meet maximum % deviations: None.
The following compounds did not meet recommended response factors: None.
The following compounds did not meet minimum response factors: None.

CHEM07 10/04/22-2 Wes Bryon, Chemist 10/04/22

CM45898 (1X)

For 8270 full list, the DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.
For 8270 BN list, benzidine peak tailing was evaluated in the DFTPP tune and was found to be in control.

Initial Calibration Evaluation (CHEM07/7_SPLIT_1004):
100% of target compounds met criteria.
The following compounds had %RSDs >20%: None.
The following compounds did not meet recommended response factors: % 2,4,6-Tribromophenol 0.041 (0.05), 2-Nitrophenol 0.039 (0.1), Hexachlorobenzene 0.073 (0.1)
The following compounds did not meet a minimum response factors: % 2,4,6-Tribromophenol 0.041 (0.05), 2-Nitrophenol 0.039 (0.05)

Continuing Calibration Verification (CHEM07/1004_26-7_SPLIT_1004):
Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.
100% of target compounds met criteria.
The following compounds did not meet % deviation criteria: None.
The following compounds did not meet maximum % deviations: None.
The following compounds did not meet recommended response factors: % 2,4,6-Tribromophenol 0.048 (0.05), 2-Nitrophenol 0.042 (0.1), Bis(2-chloroethyl)ether 0.695 (0.7), Hexachlorobenzene 0.076 (0.1)
The following compounds did not meet minimum response factors: None.

CHEM19 10/05/22-2 Matt Richard, Chemist 10/05/22

CM45900 (1X)

For 8270 full list, the DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.
For 8270 BN list, benzidine peak tailing was evaluated in the DFTPP tune and was found to be in control.

Initial Calibration Evaluation (CHEM19/19_SPLIT_0926):
100% of target compounds met criteria.
The following compounds had %RSDs >20%: None.
The following compounds did not meet recommended response factors: % 2,4,6-Tribromophenol 0.043 (0.05), 2-Nitrophenol 0.055 (0.1), Bis(2-chloroethyl)ether 0.680 (0.7), Hexachlorobenzene 0.077 (0.1)
The following compounds did not meet a minimum response factors: % 2,4,6-Tribromophenol 0.043 (0.05)

Continuing Calibration Verification (CHEM19/1005_21-19_SPLIT_0926):
Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.
100% of target compounds met criteria.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

RCP Certification Report

October 24, 2022

SDG I.D.: GCM45897

SVOA Narration

The following compounds did not meet % deviation criteria: None.
The following compounds did not meet maximum % deviations: None.
The following compounds did not meet recommended response factors: 2-Nitrophenol 0.057 (0.1), Hexachlorobenzene 0.089 (0.1)
The following compounds did not meet minimum response factors: None.

CHEM22 10/04/22-3 Wes Bryon, Chemist 10/04/22

CM45897 (1X), CM45899 (1X)

Initial Calibration Evaluation (CHEM22/22_SPLIT_1004):
100% of target compounds met criteria.
The following compounds had %RSDs >20%: None.
The following compounds did not meet recommended response factors: 2-Nitrophenol 0.057 (0.1), Hexachlorobenzene 0.084 (0.1)
The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM22/1004_27-22_SPLIT_1004):
Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.
100% of target compounds met criteria.
The following compounds did not meet % deviation criteria: None.
The following compounds did not meet maximum % deviations: None.
The following compounds did not meet recommended response factors: 2-Nitrophenol 0.058 (0.1), Hexachlorobenzene 0.094 (0.1)
The following compounds did not meet minimum response factors: None.

QC (Batch Specific):

Batch 645213 (CM47189)

CM45898

All LCS recoveries were within 40 - 140 with the following exceptions: 1,3-Dichlorobenzene(38%), 1,4-Dichlorobenzene(39%), Hexachloroethane(38%), Pyridine(33%)
This batch consists of a Blank, LCS, MS and MSD.
Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

Batch 645272 (CM46690)

CM45897, CM45899

All LCS recoveries were within 40 - 140 with the following exceptions: Pyridine(35%)
All LCSD recoveries were within 40 - 140 with the following exceptions: 2-Nitroaniline(143%), Benzidine(25%)
All LCS/LCSD RPDs were less than 30% with the following exceptions: % 2-Fluorophenol(33.3%), % Nitrobenzene-d5(31.6%), Benzidine(81.0%), N-Nitrosodimethylamine(30.9%), Pyridine(52.6%)
Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

Batch 645470 (CM45261)

CM45900

All LCS recoveries were within 40 - 140 with the following exceptions: 2,4-Dinitrophenol(11%), 4,6-Dinitro-2-methylphenol(14%), Benzoic Acid(<10%)
All LCSD recoveries were within 40 - 140 with the following exceptions: 1,3-Dichlorobenzene(34%), 1,4-Dichlorobenzene(37%), 2,4-Dinitrophenol(11%), 4,6-Dinitro-2-methylphenol(18%), Benzoic Acid(<10%), Hexachloroethane(38%), N-

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

RCP Certification Report

October 24, 2022

SDG I.D.: GCM45897

SVOA Narration

Nitrosodimethylamine(35%), Pyridine(26%)
All LCS/LCSD RPDs were less than 30% with the following exceptions: 1,2-Dichlorobenzene(38.4%), 1,3-Dichlorobenzene(48.9%), 1,4-Dichlorobenzene(42.6%), 2,2'-Oxybis(1-Chloropropane)(31.6%), Aniline(30.6%), Bis(2-chloroethyl)ether(34.0%), Hexachloroethane(44.9%), N-Nitrosodimethylamine(51.1%), Pyridine(51.4%)
Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

SVOASIM Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

Instrument:

CHEM27 10/21/22-1 Wes Bryon, Chemist 10/21/22

CM45899 (1X), CM45900 (1X)

For 8270 BN list, benzidine peak tailing was evaluated in the DFTPP tune and was found to be in control.

Initial Calibration Evaluation (CHEM27/27_BNSIM18_0808):
100% of target compounds met criteria.
The following compounds had %RSDs >20%: None.
The following compounds did not meet recommended response factors: None.
The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM27/1021_03-27_BNSIM18_0808):
Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.
100% of target compounds met criteria.
The following compounds did not meet % deviation criteria: None.
The following compounds did not meet maximum % deviations: None.
The following compounds did not meet recommended response factors: None.
The following compounds did not meet minimum response factors: None.

QC (Batch Specific):

Batch 648033 (CM66608)

CM45899, CM45900

All LCS recoveries were within 30 - 130 with the following exceptions: None.
All LCSD recoveries were within 30 - 130 with the following exceptions: None.
All LCS/LCSD RPDs were less than 20% with the following exceptions: None.
Additional 8270 criteria:20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

VOA Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

Instrument:

CHEM14 10/03/22-1 Jane Li, Chemist 10/03/22

CM45899 (1X)

Initial Calibration Evaluation (CHEM14/VT092222):

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

RCP Certification Report

October 24, 2022

SDG I.D.: GCM45897

VOA Narration

99% of target compounds met criteria.
The following compounds had %RSDs >20%: trans-1,4-dichloro-2-butene 26% (20%)
The following compounds did not meet Table 4 recommended minimum response factors: Bromoform 0.095 (0.1)
The following compounds did not meet the minimum response factor of 0.05: None.

Continuing Calibration Verification (CHEM14/1003_02-VT092222):
Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.
100% of target compounds met criteria.
The following compounds did not meet % deviation criteria: None.
The following compounds did not meet maximum % deviations: None.
The following compounds did not meet Table 4 recommended minimum response factors: None.

QC (Batch Specific):

Batch 645225 (CM44877) CHEM14 10/3/2022-1

CM45899(1X)

All LCS recoveries were within 70 - 130 with the following exceptions: None.
All LCSD recoveries were within 70 - 130 with the following exceptions: None.
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.
Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%, 25-160% for Chloroethane-HL and Trichlorofluoromethane-HL.

Temperature Narration

The samples were received at 2.1C with cooling initiated.
(Note acceptance criteria for relevant matrices is above freezing up to 6°C)

Cooler: ✓ Yes ☒ No ☐
Coolant: IPK ☒ ICE ☐ No ☐

CHAIN OF CUSTODY RECORD

Temp 2.1 °C Pg 1 of 1

PHOENIX
Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Data Delivery/Contact Options:
☐ Fax:
☐ Phone: CWebb@tighebond.com
☒ Email: HALangford@tighebond.com

Customer: Tighe & Bond Inc
Address: 213 Court Street #1100
Middletown CT

Project: Shuttle Meadow PS
Report to: Hailey Langford / Casey Webb
Invoice to: Tighe & Bond
QUOTE # DAS

Project P.O.: 25-0659-023A

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature: Becky Cotter Date: 9/29/22

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe **OIL**=Oil
B=Bulk **L**=Liquid **X** = _____(Other)

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	ETPH	VOCs	Semi-VOCs	RCRA 8	Pesticides	RCRA Metals	MS/MSD *	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [1] methanol [2] H2O	GL Soil container (8) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [ ] HCL	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
459097	B-1 (1-3)	S	9/29/22	0840	X		X	X	X	X								1						
459098	B-1 (12-14)	S	9/29/22	0915	X		X			X								1						
459099	B-2 (1-3)	S	9/29/22	1140	X	X	X	X	X	X							3	1						
459100	B-2 (7-9)	S	9/29/22	1315	X		X			X								1						

Relinquished by:	Accepted by:	Date:	Time:
Kate Cotter	T&B Fridge	9/29/22	1720
T&B Fridge	Dan Thomas	9/30/22	1100
Dan Thomas		9/30/22	1100

Comments, Special Requirements or Regulations:
DAS pricing

Turnaround Time:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other
* SURCHARGE APPLIES

*MS/MSD are considered site samples and will be billed as such in accordance with the prices quoted.

RI
☐ (Residential) Direct Exposure
☐ (Comm/Industrial) Direct Exposure
☐ GA Leachability
☐ GB Leachability
☐ GA-GW Objectives
☐ GB-GW Objectives

CT
☒ RCP Cert
☐ GW Protection
☐ SW Protection
☒ GA Mobility
☒ GB Mobility
☒ Residential DEC
☒ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1 ☐ MWRA eSMART
☐ GW-2 ☐ S-1 10% CALC
☐ GW-3
☐ S-1 GW-1 ☐ S-1 GW-2 ☐ S-1 GW-3
☐ S-2 GW-1 ☐ S-2 GW-2 ☐ S-2 GW-3
☐ S-3 GW-1 ☐ S-3 GW-2 ☐ S-3 GW-3
☐ SW Protection

State where samples were collected: CT

Data Format
☐ Excel
☒ PDF
☐ GIS/Key
☐ EQuIS
☒ Other Enviradata

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☒ Phoenix Std Report
☐ Other

* SURCHARGE APPLIES

PEL-126 REV. 06/20

Sarah Bell

From: Harley A. Langford <HALangford@tigheBond.com>
Sent: Wednesday, October 19, 2022 10:50 AM
To: Shannon Wilhelm; Sarah Bell; Casey Watts; Reports - Phoenix Labs; Greg Lawrence
Subject: RE: add on RE: Phoenix Labs - GCM45897, SHUTTLE MEADOW PS - Report Ready

Yes please

Harley Langford, LEP

Project Manager

Tighe&Bond

o. 860.704.4781 | m. 860.878.2943

213 Court Street, Suite 1100, Middletown, CT 06457

w: tighebond.com | halvorsondesign.com

From: Shannon Wilhelm <shannon@phoenixlabs.com>
Sent: Wednesday, October 19, 2022 10:49 AM
To: Sarah Bell <sarah@phoenixlabs.com>; Casey Watts <CWatts@TigheBond.com>; Reports - Phoenix Labs <Reports@phoenixlabs.com>; Greg Lawrence <greg@phoenixlabs.com>
Cc: Harley A. Langford <HALangford@tigheBond.com>
Subject: RE: add on RE: Phoenix Labs - GCM45897, SHUTTLE MEADOW PS - Report Ready
Importance: High

[Caution - External Sender]

These are past holding time. Would you still like them added?

Shannon Wilhelm
Client Services Representative
Phoenix Environmental Laboratories

587 East Middle Turnpike
Manchester CT 06040
860-645-1102

From: Sarah Bell <sarah@phoenixlabs.com>
Sent: Wednesday, October 19, 2022 10:46 AM
To: Casey Watts <CWatts@TigheBond.com>; Reports - Phoenix Labs <Reports@phoenixlabs.com>; Greg Lawrence <greg@phoenixlabs.com>
Cc: Harley A. Langford <HALangford@tigheBond.com>; Shannon Wilhelm <shannon@phoenixlabs.com>
Subject: add on RE: Phoenix Labs - GCM45897, SHUTTLE MEADOW PS - Report Ready

Yes we will do

*Note: I am currently working remotely. You may call me directly at my cell number below or email
Sarah Bell
Project Manager
Phoenix Environmental Laboratories
587 East Middle Turnpike
Sarah@phoenixlabs.com
(C)860-558-0726
Website: www.phoenixlabs.com

From: Casey Watts <CWatts@TigheBond.com>
Sent: Wednesday, October 19, 2022 10:45 AM
To: Reports - Phoenix Labs <Reports@phoenixlabs.com>; Sarah Bell <sarah@phoenixlabs.com>; Greg Lawrence <greg@phoenixlabs.com>
Cc: Harley A. Langford <HALangford@tigheBond.com>
Subject: RE: Phoenix Labs - GCM45897, SHUTTLE MEADOW PS - Report Ready

Hey Sarah and Greg,

Could we get the following additional analyses for this project?

CM45897 - B-1 (1-3) : SPLP Pesticides
CM45899 - B-2 (1-3) : SPLP Pesticides and SPLP PAHs
CM45900 - B-2 (7-9): SPLP PAHs

Casey Watts *(he/him/his)*
Environmental Scientist II

Tighe&Bond

o. 860.704.4804 | m. 203.535.5533

213 Court Street, Suite 1100, Middletown, CT 06457
w: tighebond.com | halvorsondesign.com

From: Reports@phoenixlabs.com <Reports@phoenixlabs.com>
Sent: Wednesday, October 12, 2022 4:22 PM
To: Casey Watts <CWatts@TigheBond.com>
Subject: Phoenix Labs - GCM45897, SHUTTLE MEADOW PS - Report Ready

[Caution - External Sender]

Delivery group GCM45897 (SHUTTLE MEADOW PS) for the following samples:

CM45897 - B-1 (1-3)
CM45898 - B-1 (12-14)
CM45899 - B-2 (1-3)
CM45900 - B-2 (7-9)

is available for review. Please click the following link to view report data.

www.PhoenixLabs.com

Note: The default password is your email address. You may change it after logging in.

Please take a moment to give us some feedback on your experience with Phoenix Environmental Laboratories, Inc. Your input is valuable to us!
www.phoenixlabs.com/CustomerSurvey

Phoenix Environmental Laboratories, Inc.
587 East Middle Turnpike
P.O. Box 370
Manchester, CT 06374
Tel. (860) 645-1102
Fax. (860) 645-0823
www.phoenixlabs.com

Please do not reply to this email.
cc'd:halangford@tighebond.com;cwatts@tighebond.com;pabate@tighebond.com;jjackson@tighebond.com

PHOENIX
Environmental Laboratories, Inc.

Tuesday, November 08, 2022

Attn: Harley Langford
Tighe & Bond
213 Court St, Suite 1100
Middletown, CT 06457

Project ID: **SHUTTLE MEADOW PUMP STATION**
SDG ID: **GCM75456**
Sample ID#s: **CM75456**

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

November 08, 2022

SDG I.D.: GCM75456

Project ID: SHUTTLE MEADOW PUMP STATION

Client Id	Lab Id	Matrix
MW-1	CM75456	GROUND WATER

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 08, 2022

FOR: Attn: Harley Langford
Tighe & Bond
213 Court St, Suite 1100
Middletown, CT 06457

Sample Information		Custody Information		Date	Time
Matrix:	GROUND WATER	Collected by:		11/02/22	9:00
Location Code:	TIGHE-DAS	Received by:	LB	11/02/22	14:26
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	25-0659-023A				

Laboratory Data

SDG ID: GCM75456
Phoenix ID: CM75456

Project ID: SHUTTLE MEADOW PUMP STATION
Client ID: MW-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.001	0.001	mg/L	1	11/05/22	CPP	SW6010D
Arsenic	< 0.004	0.004	mg/L	1	11/05/22	CPP	SW6010D
Barium	0.018	0.002	mg/L	1	11/05/22	CPP	SW6010D
Beryllium	< 0.001	0.001	mg/L	1	11/05/22	CPP	SW6010D
Cadmium	< 0.001	0.001	mg/L	1	11/05/22	CPP	SW6010D
Chromium	< 0.001	0.001	mg/L	1	11/05/22	CPP	SW6010D
Copper	< 0.005	0.005	mg/L	1	11/05/22	CPP	SW6010D
Mercury	< 0.0002	0.0002	mg/L	1	11/04/22	IE	SW7470A
Nickel	< 0.001	0.001	mg/L	1	11/05/22	CPP	SW6010D
Lead	< 0.002	0.002	mg/L	1	11/05/22	CPP	SW6010D
Antimony	< 0.005	0.005	mg/L	1	11/05/22	CPP	SW6010D
Selenium	< 0.010	0.010	mg/L	1	11/05/22	CPP	SW6010D
Thallium	< 0.0005	0.0005	mg/L	5	11/03/22	CPP	SW6020B
Vanadium	< 0.002	0.002	mg/L	1	11/05/22	CPP	SW6010D
Zinc	< 0.004	0.004	mg/L	1	11/05/22	CPP	SW6010D
Mercury Digestion	Completed				11/03/22	KL/AB	SW7470A
Total Metals Digestion	Completed				11/04/22	AG	
Total Metals Digestion MS	Completed				11/02/22	ag	

Project ID: SHUTTLE MEADOW PUMP STATION
Client ID: MW-1

Phoenix I.D.: CM75456

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
November 08, 2022
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

November 08, 2022

QA/QC Data

SDG I.D.: GCM75456

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 650340 (mg/L), QC Sample No: CM60368 (CM75456)													
Mercury - Water	BRL	0.0002	<0.0002	<0.0002	NC	103			101			80 - 120	20
Comment:													
Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.													
QA/QC Batch 650663 (mg/L), QC Sample No: CM75699 (CM75456)													
ICP Metals - Aqueous													
Antimony	BRL	0.005	<0.005	<0.005	NC	98.2	97.5	0.7	98.2			80 - 120	20
Arsenic	BRL	0.004	<0.004	<0.004	NC	96.3	94.8	1.6	96.2			80 - 120	20
Barium	BRL	0.002	0.012	0.012	0	98.7	98.2	0.5	98.0			80 - 120	20
Beryllium	BRL	0.001	<0.001	<0.001	NC	100	101	1.0	100			80 - 120	20
Cadmium	BRL	0.001	<0.001	<0.001	NC	99.5	99.1	0.4	98.6			80 - 120	20
Chromium	BRL	0.001	<0.001	<0.001	NC	102	101	1.0	102			80 - 120	20
Copper	BRL	0.005	<0.005	<0.005	NC	99.2	97.9	1.3	98.9			80 - 120	20
Lead	BRL	0.002	<0.002	<0.002	NC	99.4	99.1	0.3	100			80 - 120	20
Nickel	BRL	0.001	0.002	0.002	NC	98.7	98.1	0.6	97.2			80 - 120	20
Selenium	BRL	0.010	<0.010	<0.010	NC	95.7	95.5	0.2	95.6			80 - 120	20
Silver	BRL	0.001	<0.001	<0.001	NC	96.8	96.5	0.3	97.1			80 - 120	20
Vanadium	BRL	0.002	<0.002	0.003	NC	101	99.6	1.4	99.7			80 - 120	20
Zinc	BRL	0.004	<0.004	<0.004	NC	96.8	96.5	0.3	96.7			80 - 120	20
Comment:													
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.													
QA/QC Batch 650219 (mg/L), QC Sample No: CM75351 5X (CM75456)													
ICP MS Metals - Aqueous													
Thallium	BRL	0.0005	<0.0005	<0.0005	NC	101	101	0.0	101			80 - 120	20
Comment:													
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.													

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
November 08, 2022

Tuesday, November 08, 2022

Criteria: CT: GWP, SWP

State: CT

Sample Criteria Exceedances Report

GCM75456 - TIGHE-DAS

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

REASONABLE CONFIDENCE PROTOCOL
LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

Laboratory Name: Phoenix Environmental Labs, Inc. ***Client:*** Tighe & Bond

Project Location: SHUTTLE MEADOW PUMP STATION ***Project Number:***

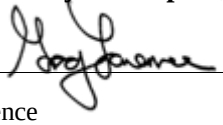
Laboratory Sample ID(s): CM75456 ***Sampling Date(s):*** 11/2/2022

List RCP Methods Used (e.g., 8260, 8270, et cetera) 6010, 7470/7471

1	**For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?**	☑ Yes ☐ No
1A	**Were the method specified preservation and holding time requirements met?**	☑ Yes ☐ No
1B	***VPH and EPH methods only:*** **Was the VPH or EPH method conducted without significant modifications (see section 11.3 of respective RCP methods)**	☐ Yes ☐ No ☑ NA
2	**Were all samples received by the laboratory in a condition consistent with that described on the associated Chain-of-Custody document(s)?**	☑ Yes ☐ No
3	**Were samples received at an appropriate temperature (< 6 Degrees C)?**	☑ Yes ☐ No ☐ NA
4	**Were all QA/QC performance criteria specified in the CTDEP Reasonable Confidence Protocol documents achieved?**	☑ Yes ☐ No
5	**a) Were reporting limits specified or referenced on the chain-of-custody?** **b) Were these reporting limits met?**	☑ Yes ☐ No ☑ Yes ☐ No
6	**For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?**	☑ Yes ☐ No
7	**Are project-specific matrix spikes and laboratory duplicates included in the data set?**	☐ Yes ☑ No

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A or 1B is "No", the data package does not meet the requirements for "Reasonable Confidence". This form may not be altered and all questions must be answered.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.

Authorized Signature:  **Position:** Assistant Lab Director

Printed Name: Greg Lawrence **Date:** Tuesday, November 08, 2022

Name of Laboratory Phoenix Environmental Labs, Inc.

This certification form is to be used for RCP methods only.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Certification Report

November 08, 2022

SDG I.D.: GCM75456

Mercury Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

Instrument:

MERLIN 11/04/22 18:41 Ian Enders, Chemist 11/04/22

CM75456

The method preparation blank, ICB, and CCBs contain all of the acids and reagents as the samples.
The initial calibration met all criteria including a standard run at or below the reporting level.
All calibration verification standards (ICV, CCV) met criteria.
All calibration blank verification standards (ICB, CCB) met criteria.
The matrix spike sample is used to identify spectral interference for each batch of samples, if within 85-115%, no interference is observed and no further action is taken.
The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.
The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.

QC (Batch Specific):

Batch 650340 (CM60368)

CM75456

All LCS recoveries were within 80 - 120 with the following exceptions: None.
Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.

ICP Metals Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

Instrument:

BLUE 11/05/22 09:14 Cindy Pearce, Chemist 11/05/22

CM75456

The initial calibration met criteria.
The continuing calibration standards met criteria for all the elements reported. The linear range is defined daily by the calibration range.
The continuing calibration blanks were less than the reporting level for the elements reported.
The ICSA and ICSAB were analyzed at the beginning and end of the run and were within criteria.The linear range is defined daily by the calibration range.
The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.
The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.
The following ICP Interference Check (ICSAB) compounds did not meet criteria: None.

QC (Batch Specific):

Batch 650663 (CM75699)

CM75456

All LCS recoveries were within 80 - 120 with the following exceptions: None.
All LCSD recoveries were within 80 - 120 with the following exceptions: None.
All LCS/LCSD RPDs were less than 20% with the following exceptions: None.
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Certification Report

November 08, 2022

SDG I.D.: GCM75456

ICPMS Metals Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

Instrument:

ICPMS 11/03/22 11:36 Cindy Pearce, Chemist 11/03/22

CM75456

The linear range is defined daily by the calibration range.
The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.
The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.
The following samples did not meet internal standard criteria: None.

QC (Batch Specific):

Batch 650219 (CM75351)

CM75456

All LCS recoveries were within 80 - 120 with the following exceptions: None.
All LCSD recoveries were within 80 - 120 with the following exceptions: None.
All LCS/LCSD RPDs were less than 20% with the following exceptions: None.
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.

Temperature Narration

The samples in this delivery group were received at 1.1°C.
(Note acceptance criteria for relevant matrices is above freezing up to 6°C)

Cooler: Yes [X] No [ ]
Coolant: IPK [X] ICE [ ] No [ ]

PHOENIX
Environmental Laboratories, Inc.

CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email Makrina Nolan: makrina@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-1102

Temp 1.1 °C Pg 1 of 1

Data Delivery/Contact Options:
[ ] Fax:
[ ] Phone:
[X] Email: HAlmyta@TyleBond.com

Customer: Tyle & Bond Inc
Address: 213 Court Street 11th Floor
Middletown, CT 06457

Project: Shuttle Meadow Pump Station
Report to: Hurley Lunyford, Casey Keith
Invoice to: Tyle & Bond Westfield
QUOTE # DAS Pricing

Project P.O: 25-0659-0234

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature: [signature] Date: 11/2/22

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe **OIL**=Oil
B=Bulk **L**=Liquid **X** = _____(Other)

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	RSR IS Total Metals	RSR IS Dissolved Metals	Sample on hold	MS/MSD*	GL Amber 8 oz. [ ] H3PO4 [ ] NAHSO4	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( ) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [ ] HCL	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
75456	MW-1	GW	11/2/22	0900	X											1				
75457	MW-1 (FILTERED)	GW	11/2/22	0900				X								1				

Relinquished by:	Accepted by:	Date:	Time:
[signature]	Tyle & Bond Fedex	11/2/22	1025
[signature]	[signature]	11/2/22	1241
[signature]	[signature]	11/02	1426

Comments, Special Requirements or Regulations:

*MS/MSD are considered site samples and will be billed as such in accordance with the prices quoted.

Turnaround Time:
[ ] 1 Day*
[ ] 2 Days*
[ ] 3 Days*
[X] Standard
[ ] Other
* SURCHARGE APPLIES

RI
[ ] (Residential) Direct Exposure
[ ] (Comm/Industrial) Direct Exposure
[ ] GA Leachability
[ ] GB Leachability
[ ] GA-GW Objectives
[ ] GB-GW Objectives

CT
[X] RCP Cert
[X] GW Protection
[X] SW Protection
[ ] GA Mobility
[ ] GB Mobility
[ ] Residential DEC
[ ] I/C DEC
[ ] Other

MA
[ ] MCP Certification
[ ] GW-1 [ ] MWRA eSMART
[ ] GW-2 [ ] S-1 10% CALC
[ ] GW-3
[ ] S-1 GW-1 [ ] S-1 GW-2 [ ] S-1 GW-3
[ ] S-2 GW-1 [ ] S-2 GW-2 [ ] S-2 GW-3
[ ] S-3 GW-1 [ ] S-3 GW-2 [ ] S-3 GW-3
[ ] SW Protection

State where samples were collected: CT

Data Format
[ ] Excel
[X] PDF
[ ] GIS/Key
[ ] EQuIS
[X] Other Enviro.Data

Data Package
[ ] Tier II Checklist
[ ] Full Data Package*
[X] Phoenix Std Report
[ ] Other
* SURCHARGE APPLIES

PEL-126 REV. 03/22

PHOENIX
Environmental Laboratories, Inc.

Monday, October 10, 2022

Attn: Harley Langford
Tighe & Bond
213 Court St, Suite 1100
Middletown, CT 06457

Project ID: SHUTTLE MEADOW PS
SDG ID: GCM45903
Sample ID#s: CM45903

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

SDG Comments

October 10, 2022

SDG I.D.: GCM45903

Volatile 8260 analysis:
1,2-Dibromoethane and 1,2-Dibromo-3-chloropropane do not meet GWP criteria, these compounds are analyzed by GC/ECD to achieve this criteria.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

October 10, 2022

SDG I.D.: GCM45903

Project ID: SHUTTLE MEADOW PS

Client Id	Lab Id	Matrix
B-1-GW	CM45903	GROUND WATER

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 10, 2022

FOR: Attn: Harley Langford
Tighe & Bond
213 Court St, Suite 1100
Middletown, CT 06457

Sample Information		Custody Information		Date	Time
Matrix:	GROUND WATER	Collected by:		09/29/22	14:30
Location Code:	TIGHE-DAS	Received by:	CP	09/30/22	11:50
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	25-0659-023A				

Laboratory Data

SDG ID: GCM45903
Phoenix ID: CM45903

Project ID: SHUTTLE MEADOW PS
Client ID: B-1-GW

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.001	0.001	mg/L	1	10/07/22	TH	SW6010D
Arsenic	0.022	0.004	mg/L	1	10/07/22	TH	SW6010D
Barium	1.86	0.002	mg/L	1	10/07/22	TH	SW6010D
Beryllium	0.003	0.001	mg/L	1	10/07/22	TH	SW6010D
Cadmium	0.002	0.001	mg/L	1	10/07/22	TH	SW6010D
Chromium	0.019	0.001	mg/L	1	10/07/22	TH	SW6010D
Copper	0.047	0.005	mg/L	1	10/07/22	TH	SW6010D
Mercury	< 0.0002	0.0002	mg/L	1	10/04/22	IE	SW7470A
Nickel	0.045	0.001	mg/L	1	10/07/22	TH	SW6010D
Lead	0.028	0.002	mg/L	1	10/07/22	TH	SW6010D
Antimony	< 0.005	0.005	mg/L	1	10/07/22	TH	SW6010D
Selenium	< 0.010	0.010	mg/L	1	10/07/22	TH	SW6010D
Thallium	< 0.0005	0.0005	mg/L	5	10/07/22	MGH	SW6020B
Vanadium	0.053	0.002	mg/L	1	10/07/22	TH	SW6010D
Zinc	0.081	0.004	mg/L	1	10/07/22	TH	SW6010D
Extraction of ETPH	Completed				10/03/22	X/K	SW3510C/SW3520C
Mercury Digestion	Completed				10/02/22	AB/AB	SW7470A
Semi-Volatile Extraction	Completed				09/30/22	X/K	SW3520C
Total Metals Digestion	Completed				09/30/22	AG	
Total Metals Digestion MS	Completed				10/03/22	AG	
TPH by GC (Extractable Products)							
Ext. Petroleum H.C. (C9-C36)	ND	0.071	mg/L	1	10/05/22	JRB	CTETPH 8015D
Identification	ND		mg/L	1	10/05/22	JRB	CTETPH 8015D
QA/QC Surrogates							
% Terphenyl (surr)	51		%	1	10/05/22	JRB	50 - 150 %

Ver 1

Project ID: SHUTTLE MEADOW PS
Client ID: B-1-GW

Phoenix I.D.: CM45903

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Volatiles							
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,1,1-Trichloroethane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,1,2,2-Tetrachloroethane	ND	0.50	ug/L	1	10/07/22	MH	SW8260C
1,1,2-Trichloroethane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,1-Dichloroethane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,1-Dichloroethene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,1-Dichloropropene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,2,3-Trichlorobenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,2,3-Trichloropropane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,2,4-Trichlorobenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,2-Dibromo-3-chloropropane	ND	0.50	ug/L	1	10/07/22	MH	SW8260C
1,2-Dibromoethane	ND	0.25	ug/L	1	10/07/22	MH	SW8260C
1,2-Dichlorobenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,2-Dichloroethane	ND	0.60	ug/L	1	10/07/22	MH	SW8260C
1,2-Dichloropropane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,3-Dichlorobenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,3-Dichloropropane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
1,4-Dichlorobenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
2,2-Dichloropropane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
2-Chlorotoluene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
2-Hexanone	ND	5.0	ug/L	1	10/07/22	MH	SW8260C
2-Isopropyltoluene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
4-Chlorotoluene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
4-Methyl-2-pentanone	ND	5.0	ug/L	1	10/07/22	MH	SW8260C
Acetone	ND	25	ug/L	1	10/07/22	MH	SW8260C
Acrylonitrile	ND	0.50	ug/L	1	10/07/22	MH	SW8260C
Benzene	ND	0.70	ug/L	1	10/07/22	MH	SW8260C
Bromobenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Bromochloromethane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Bromodichloromethane	ND	0.50	ug/L	1	10/07/22	MH	SW8260C
Bromoform	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Bromomethane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Carbon Disulfide	ND	5.0	ug/L	1	10/07/22	MH	SW8260C
Carbon tetrachloride	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Chlorobenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Chloroethane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Chloroform	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Chloromethane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
cis-1,2-Dichloroethene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
cis-1,3-Dichloropropene	ND	0.40	ug/L	1	10/07/22	MH	SW8260C
Dibromochloromethane	ND	0.50	ug/L	1	10/07/22	MH	SW8260C
Dibromomethane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Dichlorodifluoromethane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Ethylbenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Hexachlorobutadiene	ND	0.40	ug/L	1	10/07/22	MH	SW8260C
Isopropylbenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C

Project ID: SHUTTLE MEADOW PS
Client ID: B-1-GW

Phoenix I.D.: CM45903

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
m&p-Xylene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Methyl ethyl ketone	ND	5.0	ug/L	1	10/07/22	MH	SW8260C
Methyl t-butyl ether (MTBE)	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Methylene chloride	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Naphthalene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
n-Butylbenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
n-Propylbenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
o-Xylene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
p-Isopropyltoluene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
sec-Butylbenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Styrene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
tert-Butylbenzene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Tetrachloroethene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Tetrahydrofuran (THF)	ND	2.5	ug/L	1	10/07/22	MH	SW8260C
Toluene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Total Xylenes	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
trans-1,2-Dichloroethene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
trans-1,3-Dichloropropene	ND	0.40	ug/L	1	10/07/22	MH	SW8260C
trans-1,4-dichloro-2-butene	ND	5.0	ug/L	1	10/07/22	MH	SW8260C
Trichloroethene	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Trichlorofluoromethane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Trichlorotrifluoroethane	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
Vinyl chloride	ND	1.0	ug/L	1	10/07/22	MH	SW8260C
QA/QC Surrogates							
% 1,2-dichlorobenzene-d4	99		%	1	10/07/22	MH	70 - 130 %
% Bromofluorobenzene	98		%	1	10/07/22	MH	70 - 130 %
% Dibromofluoromethane	100		%	1	10/07/22	MH	70 - 130 %
% Toluene-d8	100		%	1	10/07/22	MH	70 - 130 %

Semivolatiles by SIM, PAH

2-Methylnaphthalene	0.59	0.50	ug/L	1	10/03/22	WB	SW8270D (SIM)
Acenaphthene	ND	0.50	ug/L	1	10/03/22	WB	SW8270D (SIM)
Acenaphthylene	ND	0.30	ug/L	1	10/03/22	WB	SW8270D (SIM)
Anthracene	ND	0.50	ug/L	1	10/03/22	WB	SW8270D (SIM)
Benz(a)anthracene	ND	0.05	ug/L	1	10/03/22	WB	SW8270D (SIM)
Benzo(a)pyrene	ND	0.20	ug/L	1	10/03/22	WB	SW8270D (SIM)
Benzo(b)fluoranthene	ND	0.07	ug/L	1	10/03/22	WB	SW8270D (SIM)
Benzo(ghi)perylene	ND	0.48	ug/L	1	10/03/22	WB	SW8270D (SIM)
Benzo(k)fluoranthene	ND	0.30	ug/L	1	10/03/22	WB	SW8270D (SIM)
Chrysene	ND	0.50	ug/L	1	10/03/22	WB	SW8270D (SIM)
Dibenz(a,h)anthracene	ND	0.10	ug/L	1	10/03/22	WB	SW8270D (SIM)
Fluoranthene	ND	0.50	ug/L	1	10/03/22	WB	SW8270D (SIM)
Fluorene	ND	0.50	ug/L	1	10/03/22	WB	SW8270D (SIM)
Indeno(1,2,3-cd)pyrene	ND	0.10	ug/L	1	10/03/22	WB	SW8270D (SIM)
Naphthalene	0.64	0.50	ug/L	1	10/03/22	WB	SW8270D (SIM)
Phenanthrene	0.22	0.06	ug/L	1	10/03/22	WB	SW8270D (SIM)
Pyrene	ND	0.50	ug/L	1	10/03/22	WB	SW8270D (SIM)
QA/QC Surrogates							
% 2-Fluorobiphenyl	57		%	1	10/03/22	WB	30 - 130 %
% Nitrobenzene-d5	84		%	1	10/03/22	WB	30 - 130 %

Ver 1

Project ID: SHUTTLE MEADOW PS
Client ID: B-1-GW

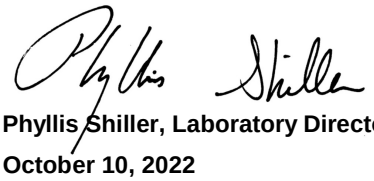
Phoenix I.D.: CM45903

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
% Terphenyl-d14	34		%	1	10/03/22	WB	30 - 130 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director

October 10, 2022

Reviewed and Released by: Greg Lawrence, Assistant Lab Director

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

October 10, 2022

QA/QC Data

SDG I.D.: GCM45903

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 644891 (mg/L), QC Sample No: CM47206 (CM45903)													
Mercury - Water	BRL	0.0002	<0.0002	<0.0002	NC	104			100			80 - 120	20
Comment:													
Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.													
QA/QC Batch 644778 (mg/L), QC Sample No: CM46668 (CM45903)													
ICP Metals - Aqueous													
Antimony	BRL	0.005	<0.005	<0.005	NC	105	102	2.9	112	109	2.7	80 - 120	20
Arsenic	BRL	0.004	0.035	0.039	10.8	103	99.8	3.2	111	108	2.7	80 - 120	20
Barium	BRL	0.002	0.055	0.057	3.60	106	102	3.8	112	109	2.7	80 - 120	20
Beryllium	BRL	0.001	<0.001	<0.001	NC	109	106	2.8	115	112	2.6	80 - 120	20
Cadmium	BRL	0.001	<0.001	<0.001	NC	104	100	3.9	110	107	2.8	80 - 120	20
Chromium	BRL	0.001	<0.001	<0.001	NC	107	103	3.8	111	108	2.7	80 - 120	20
Copper	BRL	0.005	<0.005	<0.005	NC	109	105	3.7	115	112	2.6	80 - 120	20
Lead	BRL	0.002	<0.002	<0.002	NC	106	102	3.8	113	110	2.7	80 - 120	20
Nickel	BRL	0.001	<0.001	0.001	NC	106	102	3.8	111	108	2.7	80 - 120	20
Selenium	BRL	0.010	<0.010	<0.010	NC	105	101	3.9	113	111	1.8	80 - 120	20
Silver	BRL	0.001	<0.001	<0.001	NC	109	105	3.7	117	113	3.5	80 - 120	20
Vanadium	BRL	0.002	<0.002	<0.002	NC	107	103	3.8	113	110	2.7	80 - 120	20
Zinc	BRL	0.004	<0.004	<0.004	NC	105	101	3.9	111	108	2.7	80 - 120	20
Comment:													
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.													
QA/QC Batch 645063 (mg/L), QC Sample No: CM43744 5X (CM45903)													
ICP MS Metals - Aqueous													
Thallium	BRL	0.0005	<0.0005	<0.0005	NC	104	102	1.9	95.2			80 - 120	20
Comment:													
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.													

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

October 10, 2022

QA/QC Data

SDG I.D.: GCM45903

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
QA/QC Batch 645055 (mg/L), QC Sample No: CM46404 (CM45903)											
TPH by GC (Extractable Products) - Ground Water											
Ext. Petroleum H.C. (C9-C36)	ND	0.10	98	89	9.6				60 - 120	30	
% Terphenyl (surr)	66	%	67	61	9.4				50 - 150	20	
Comment:											
Additional surrogate criteria: LCS acceptance range is 60-120% MS acceptance range 50-150%. The ETPH/DRO LCS has been normalized based on the alkane calibration.											
QA/QC Batch 644757 (ug/L), QC Sample No: CM46668 (CM45903)											
Semivolatiles by SIM, PAH - Ground Water											
2-Methylnaphthalene	ND	0.50	66	62	6.3	51	46	10.3	30 - 130	20	
Acenaphthene	ND	0.50	70	67	4.4	65	61	6.3	30 - 130	20	
Acenaphthylene	ND	0.10	62	62	0.0	58	55	5.3	30 - 130	20	
Anthracene	ND	0.10	75	72	4.1	68	65	4.5	30 - 130	20	
Benz(a)anthracene	ND	0.02	81	75	7.7	62	64	3.2	30 - 130	20	
Benzo(a)pyrene	ND	0.02	75	66	12.8	54	57	5.4	30 - 130	20	
Benzo(b)fluoranthene	ND	0.02	76	66	14.1	52	55	5.6	30 - 130	20	
Benzo(ghi)perylene	ND	0.02	85	66	25.2	58	60	3.4	30 - 130	20	r
Benzo(k)fluoranthene	ND	0.02	74	62	17.6	50	53	5.8	30 - 130	20	
Chrysene	ND	0.02	77	69	11.0	58	59	1.7	30 - 130	20	
Dibenz(a,h)anthracene	ND	0.02	94	71	27.9	64	68	6.1	30 - 130	20	r
Fluoranthene	ND	0.50	79	75	5.2	68	66	3.0	30 - 130	20	
Fluorene	ND	0.10	74	72	2.7	69	64	7.5	30 - 130	20	
Indeno(1,2,3-cd)pyrene	ND	0.02	103	80	25.1	70	73	4.2	30 - 130	20	r
Naphthalene	ND	0.50	68	62	9.2	50	45	10.5	30 - 130	20	
Phenanthrene	ND	0.06	77	73	5.3	71	66	7.3	30 - 130	20	
Pyrene	ND	0.07	81	76	6.4	68	67	1.5	30 - 130	20	
% 2-Fluorobiphenyl	64	%	64	64	0.0	60	54	10.5	30 - 130	20	
% Nitrobenzene-d5	80	%	74	77	4.0	84	77	8.7	30 - 130	20	
% Terphenyl-d14	82	%	77	70	9.5	57	58	1.7	30 - 130	20	
Comment:											
Additional 8270 criteria:20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)											
QA/QC Batch 646179 (ug/L), QC Sample No: CM45919 (CM45903)											
Volatiles - Ground Water											
1,1,1,2-Tetrachloroethane	ND	1.0	114	119	4.3				70 - 130	30	
1,1,1-Trichloroethane	ND	1.0	113	118	4.3				70 - 130	30	
1,1,2,2-Tetrachloroethane	ND	0.50	102	109	6.6				70 - 130	30	
1,1,2-Trichloroethane	ND	1.0	104	108	3.8				70 - 130	30	
1,1-Dichloroethane	ND	1.0	111	117	5.3				70 - 130	30	
1,1-Dichloroethene	ND	1.0	113	121	6.8				70 - 130	30	
1,1-Dichloropropene	ND	1.0	110	116	5.3				70 - 130	30	
1,2,3-Trichlorobenzene	ND	1.0	105	112	6.5				70 - 130	30	

QA/QC Data

SDG I.D.: GCM45903

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
1,2,3-Trichloropropane	ND	1.0	104	110	5.6				70 - 130	30
1,2,4-Trichlorobenzene	ND	1.0	105	114	8.2				70 - 130	30
1,2,4-Trimethylbenzene	ND	1.0	114	119	4.3				70 - 130	30
1,2-Dibromo-3-chloropropane	ND	1.0	111	115	3.5				70 - 130	30
1,2-Dibromoethane	ND	1.0	106	110	3.7				70 - 130	30
1,2-Dichlorobenzene	ND	1.0	107	112	4.6				70 - 130	30
1,2-Dichloroethane	ND	1.0	103	110	6.6				70 - 130	30
1,2-Dichloropropane	ND	1.0	104	110	5.6				70 - 130	30
1,3,5-Trimethylbenzene	ND	1.0	114	121	6.0				70 - 130	30
1,3-Dichlorobenzene	ND	1.0	109	114	4.5				70 - 130	30
1,3-Dichloropropane	ND	1.0	106	112	5.5				70 - 130	30
1,4-Dichlorobenzene	ND	1.0	107	112	4.6				70 - 130	30
2,2-Dichloropropane	ND	1.0	115	119	3.4				70 - 130	30
2-Chlorotoluene	ND	1.0	112	118	5.2				70 - 130	30
2-Hexanone	ND	5.0	97	100	3.0				70 - 130	30
2-Isopropyltoluene	ND	1.0	113	119	5.2				70 - 130	30
4-Chlorotoluene	ND	1.0	113	118	4.3				70 - 130	30
4-Methyl-2-pentanone	ND	5.0	94	100	6.2				70 - 130	30
Acetone	ND	5.0	93	99	6.3				70 - 130	30
Acrylonitrile	ND	5.0	103	107	3.8				70 - 130	30
Benzene	ND	0.70	108	115	6.3				70 - 130	30
Bromobenzene	ND	1.0	108	114	5.4				70 - 130	30
Bromochloromethane	ND	1.0	107	113	5.5				70 - 130	30
Bromodichloromethane	ND	0.50	106	116	9.0				70 - 130	30
Bromoform	ND	1.0	108	114	5.4				70 - 130	30
Bromomethane	ND	1.0	137	145	5.7				70 - 130	30
Carbon Disulfide	ND	1.0	105	111	5.6				70 - 130	30
Carbon tetrachloride	ND	1.0	116	122	5.0				70 - 130	30
Chlorobenzene	ND	1.0	107	113	5.5				70 - 130	30
Chloroethane	ND	1.0	113	119	5.2				70 - 130	30
Chloroform	ND	1.0	115	120	4.3				70 - 130	30
Chloromethane	ND	1.0	102	108	5.7				70 - 130	30
cis-1,2-Dichloroethene	ND	1.0	115	116	0.9				70 - 130	30
cis-1,3-Dichloropropene	ND	0.40	105	113	7.3				70 - 130	30
Dibromochloromethane	ND	0.50	108	114	5.4				70 - 130	30
Dibromomethane	ND	1.0	103	111	7.5				70 - 130	30
Dichlorodifluoromethane	ND	1.0	90	94	4.3				70 - 130	30
Ethylbenzene	ND	1.0	112	117	4.4				70 - 130	30
Hexachlorobutadiene	ND	0.40	102	108	5.7				70 - 130	30
Isopropylbenzene	ND	1.0	113	120	6.0				70 - 130	30
m&p-Xylene	ND	1.0	113	118	4.3				70 - 130	30
Methyl ethyl ketone	ND	5.0	99	104	4.9				70 - 130	30
Methyl t-butyl ether (MTBE)	ND	1.0	103	108	4.7				70 - 130	30
Methylene chloride	ND	1.0	98	103	5.0				70 - 130	30
Naphthalene	ND	1.0	106	112	5.5				70 - 130	30
n-Butylbenzene	ND	1.0	118	124	5.0				70 - 130	30
n-Propylbenzene	ND	1.0	114	119	4.3				70 - 130	30
o-Xylene	ND	1.0	110	116	5.3				70 - 130	30
p-Isopropyltoluene	ND	1.0	117	121	3.4				70 - 130	30
sec-Butylbenzene	ND	1.0	116	121	4.2				70 - 130	30
Styrene	ND	1.0	111	117	5.3				70 - 130	30
tert-Butylbenzene	ND	1.0	113	119	5.2				70 - 130	30
Tetrachloroethene	ND	1.0	107	112	4.6				70 - 130	30

QA/QC Data

SDG I.D.: GCM45903

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
Tetrahydrofuran (THF)	ND	2.5	90	94	4.3				70 - 130	30
Toluene	ND	1.0	110	115	4.4				70 - 130	30
trans-1,2-Dichloroethene	ND	1.0	112	117	4.4				70 - 130	30
trans-1,3-Dichloropropene	ND	0.40	106	114	7.3				70 - 130	30
trans-1,4-dichloro-2-butene	ND	5.0	111	119	7.0				70 - 130	30
Trichloroethene	ND	1.0	106	113	6.4				70 - 130	30
Trichlorofluoromethane	ND	1.0	112	118	5.2				70 - 130	30
Trichlorotrifluoroethane	ND	1.0	101	105	3.9				70 - 130	30
Vinyl chloride	ND	1.0	114	119	4.3				70 - 130	30
% 1,2-dichlorobenzene-d4	100	%	99	99	0.0				70 - 130	30
% Bromofluorobenzene	99	%	101	99	2.0				70 - 130	30
% Dibromofluoromethane	99	%	101	100	1.0				70 - 130	30
% Toluene-d8	99	%	100	101	1.0				70 - 130	30

Comment:

A LCS and LCS Duplicate were performed instead of a matrix spike and matrix spike duplicate.

Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%, 25-160% for Chloroethane-HL and Trichlorofluoromethane-HL.

l = This parameter is outside laboratory LCS/LCSD specified recovery limits.
r = This parameter is outside laboratory RPD specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
October 10, 2022

Monday, October 10, 2022

Criteria: CT: GWP, SWP

State: CT

Sample Criteria Exceedances Report

GCM45903 - TIGHE-DAS

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
CM45903	$8260GWR	1,2-Dibromo-3-chloropropane	CT / RSR GWPC (ug/l) / APS Organics	ND	0.50	0.2	0.2	ug/L
CM45903	$8260GWR	1,2-Dibromoethane	CT / RSR GWPC (ug/l) / Volatiles	ND	0.25	0.05	0.05	ug/L
CM45903	AS-WM	Arsenic	CT / RSR SWPC (ug/l) / Inorganics	0.022	0.004	0.004	0.004	mg/L
CM45903	BA-WM	Barium	CT / RSR GWPC (ug/l) / Inorganics	1.86	0.002	1	1	mg/L
CM45903	PB-WM	Lead	CT / RSR GWPC (ug/l) / Inorganics	0.028	0.002	0.015	0.015	mg/L
CM45903	PB-WM	Lead	CT / RSR SWPC (ug/l) / Inorganics	0.028	0.002	0.013	0.013	mg/L
CM45903	V-WM	Vanadium	CT / RSR GWPC (ug/l) / Inorganics	0.053	0.002	0.05	0.05	mg/L

REASONABLE CONFIDENCE PROTOCOL
LABORATORY ANALYSIS QA/QC CERTIFICATION FORM

Laboratory Name: Phoenix Environmental Labs, Inc. ***Client:*** Tighe & Bond

Project Location: SHUTTLE MEADOW PS ***Project Number:***

Laboratory Sample ID(s): CM45903 ***Sampling Date(s):*** 9/29/2022

List RCP Methods Used (e.g., 8260, 8270, et cetera) 6010, 7470/7471, 8260, 8270, ETPH

1	**For each analytical method referenced in this laboratory report package, were all specified QA/QC performance criteria followed, including the requirement to explain any criteria falling outside of acceptable guidelines, as specified in the CT DEP method-specific Reasonable Confidence Protocol documents?**	☑ Yes ☐ No
1A	**Were the method specified preservation and holding time requirements met?**	☑ Yes ☐ No
1B	***VPH and EPH methods only:*** **Was the VPH or EPH method conducted without significant modifications (see section 11.3 of respective RCP methods)**	☐ Yes ☐ No ☑ NA
2	**Were all samples received by the laboratory in a condition consistent with that described on the associated Chain-of-Custody document(s)?**	☑ Yes ☐ No
3	**Were samples received at an appropriate temperature (< 6 Degrees C)?**	☑ Yes ☐ No ☐ NA
4	**Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents acheived? See Sections: SVOASIM Narration, VOA Narration.**	☐ Yes ☑ No
5	**a) Were reporting limits specified or referenced on the chain-of-custody?** **b) Were these reporting limits met?**	☑ Yes ☐ No ☐ Yes ☑ No
6	**For each analytical method referenced in this laboratory report package, were results reported for all constituents identified in the method-specific analyte lists presented in the Reasonable Confidence Protocol documents?**	☐ Yes ☑ No
7	**Are project-specific matrix spikes and laboratory duplicates included in the data set?**	☐ Yes ☑ No

Notes: For all questions to which the response was "No" (with the exception of question #7), additional information must be provided in an attached narrative. If the answer to question #1, #1A or 1B is "No", the data package does not meet the requirements for "Reasonable Confidence". This form may not be altered and all questions must be answered.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete.

Authorized Signature: _____ **Position:** Assistant Lab Director

Printed Name: Greg Lawrence **Date:** Monday, October 10, 2022

Name of Laboratory Phoenix Environmental Labs, Inc.

This certification form is to be used for RCP methods only.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

RCP Certification Report

October 10, 2022

SDG I.D.: GCM45903

SDG Comments

8270 Semi-volatile Organics:
Only the PAH constituents are reported as requested on the chain-of-custody. In order to achieve the requested reporting levels for the target compounds, the sample was extracted and analyzed via 8270 selective ion monitoring (SIM).

Volatile 8260 analysis:
1,2-Dibromoethane and 1,2-Dibromo-3-chloropropane do not meet the GWP these compounds are analyzed by GC/ECD to achieve this criteria.

ETPH Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? Yes.

Instrument:

AU-XL2 10/03/22-1 Jeff Bucko, Chemist 10/03/22

CM45903 (1X)

The initial calibration (ETPH929I) RSD for the compound list was less than 30% except for the following compounds: None.
As per section 7.2.3, a discrimination check standard was run (O03A003A_1) and contained the following outliers: None.
The continuing calibration %D for the compound list was less than 30% except for the following compounds:None.

QC (Batch Specific):

Batch 645055 (CM46404)

CM45903

All LCS recoveries were within 60 - 120 with the following exceptions: None.
All LCSD recoveries were within 60 - 120 with the following exceptions: None.
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.
Additional surrogate criteria: LCS acceptance range is 60-120% MS acceptance range 50-150%. The ETPH/DRO LCS has been normalized based on the alkane calibration.

Mercury Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

Instrument:

MERLIN 10/04/22 10:34 Ian Enders, Chemist 10/04/22

CM45903

The method preparation blank, ICB, and CCBs contain all of the acids and reagents as the samples.
The initial calibration met all criteria including a standard run at or below the reporting level.
All calibration verification standards (ICV, CCV) met criteria.
All calibration blank verification standards (ICB, CCB) met criteria.
The matrix spike sample is used to identify spectral interference for each batch of samples, if within 85-115%, no interference is observed and no further action is taken.
The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.
The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.

QC (Batch Specific):

Batch 644891 (CM47206)

CM45903

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Certification Report

October 10, 2022

SDG I.D.: GCM45903

Mercury Narration

All LCS recoveries were within 80 - 120 with the following exceptions: None.
Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.

ICP Metals Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

Instrument:

ARCOS 10/07/22 08:21 Tina Hall, Chemist 10/07/22

CM45903

Additional criteria for CCV and ICSAB:
Sodium and Potassium are poor performing elements, the laboratory's in-house limits are 85-115% (CCV) and 70-130% (ICSAB).The linear range is defined daily by the calibration range.
The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.
The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.
The following ICP Interference Check (ICSAB) compounds did not meet criteria: None.

QC (Batch Specific):

Batch 644778 (CM46668)

CM45903

All LCS recoveries were within 80 - 120 with the following exceptions: None.
All LCSD recoveries were within 80 - 120 with the following exceptions: None.
All LCS/LCSD RPDs were less than 20% with the following exceptions: None.
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.

ICPMS Metals Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

Instrument:

ICPMS 10/07/22 14:01 Mike Hornak, Chemist 10/07/22

CM45903

The linear range is defined daily by the calibration range.
The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.
The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.
The following samples did not meet internal standard criteria: None.

QC (Batch Specific):

Batch 645063 (CM43744)

CM45903

All LCS recoveries were within 80 - 120 with the following exceptions: None.
All LCSD recoveries were within 80 - 120 with the following exceptions: None.
All LCS/LCSD RPDs were less than 20% with the following exceptions: None.
Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

RCP Certification Report

October 10, 2022

SDG I.D.: GCM45903

SVOASIM Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

QC Batch 644757 (Samples: CM45903): -----

The LCS/LCSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in the sample(s) so no variability is suspected. (Benzo(ghi)perylene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene)

Instrument:

CHEM33 10/03/22-1 Wes Bryon, Chemist 10/03/22

CM45903 (1X)

Initial Calibration Evaluation (CHEM33/33_PAHSIM_0919):
100% of target compounds met criteria.
The following compounds had %RSDs >20%: None.
The following compounds did not meet recommended response factors: None.
The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM33/1003_03-33_PAHSIM_0919):
Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.
100% of target compounds met criteria.
The following compounds did not meet % deviation criteria: None.
The following compounds did not meet maximum % deviations: None.
The following compounds did not meet recommended response factors: None.
The following compounds did not meet minimum response factors: None.

QC (Batch Specific):

Batch 644757 (CM46668)

CM45903

All LCS recoveries were within 30 - 130 with the following exceptions: None.
All LCSD recoveries were within 30 - 130 with the following exceptions: None.
All LCS/LCSD RPDs were less than 20% with the following exceptions: Benzo(ghi)perylene(25.2%), Dibenz(a,h)anthracene(27.9%), Indeno(1,2,3-cd)pyrene(25.1%)
Additional 8270 criteria:20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

VOA Narration

Were all QA/QC performance criteria specified in the Reasonable Confidence Protocol documents achieved? No.

QC Batch 646179 (Samples: CM45903): -----

The LCS/LCSD recovery is above the upper range for one analyte that was not reported in the sample(s), therefore no significant bias is suspected. (Bromomethane)

Instrument:

CHEM17 10/07/22-1 Michael Hahn, Chemist 10/07/22

CM45903 (1X)

Chem 17 is a 25ml purge instrument. The laboratory minimum response factor is set at 0.01 instead of 0.05 for the 25ml purge instruments.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

RCP Certification Report

October 10, 2022

SDG I.D.: GCM45903

VOA Narration

EPA method 8260D Table 4 supports this approach.

Initial Calibration Evaluation (CHEM17/VT-100522):
92% of target compounds met criteria.
The following compounds had %RSDs >20%: 1,2-Dibromo-3-chloropropane 26% (20%), Bromoform 27% (20%), Bromomethane 26% (20%), Dibromochloromethane 21% (20%), Tetrahydrofuran (THF) 22% (20%), trans-1,3-Dichloropropene 22% (20%), trans-1,4-dichloro-2-butene 34% (20%)
The following compounds did not meet Table 4 recommended minimum response factors: 1,2-Dibromo-3-chloropropane 0.034 (0.05), 2-Hexanone 0.072 (0.1), 4-Methyl-2-pentanone 0.098 (0.1), Acetone 0.039 (0.1), Bromoform 0.067 (0.1), Methyl ethyl ketone 0.070 (0.1), Tetrahydrofuran (THF) 0.043 (0.05)
The following compounds did not meet the minimum response factor of 0.05: 1,2-Dibromo-3-chloropropane 0.034 (0.05), Acetone 0.039 (0.05), Tetrahydrofuran (THF) 0.043 (0.05)

Continuing Calibration Verification (CHEM17/1007_01-VT-100522):
Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.
100% of target compounds met criteria.
The following compounds did not meet % deviation criteria: None.
The following compounds did not meet maximum % deviations: None.
The following compounds did not meet Table 4 recommended minimum response factors: 1,2-Dibromo-3-chloropropane 0.034 (0.05), Acetone 0.036 (0.05), Acrylonitrile 0.049 (0.05), Tetrahydrofuran (THF) 0.038 (0.05)

QC (Batch Specific):

Batch 646179 (CM45919) CHEM17 10/7/2022-1

CM45903(1X)

All LCS recoveries were within 70 - 130 with the following exceptions: Bromomethane(137%)
All LCSD recoveries were within 70 - 130 with the following exceptions: Bromomethane(145%)
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.
A LCS and LCS Duplicate were performed instead of a matrix spike and matrix spike duplicate.
Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%, 25-160% for Chloroethane-HL and Trichlorofluoromethane-HL.

Temperature Narration

The samples were received at 2.1C with cooling initiated.
(Note acceptance criteria for relevant matrices is above freezing up to 6°C)

Cooler: Yes ☑ No ☐
Coolant: IPK ☑ ICE ☐ No ☐

PHOENIX
Environmental Laboratories, Inc.

CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 2.1 °C Pg 1 of 1

Data Delivery/Contact Options:
☐ Fax:
☐ Phone: CWath@tyleband.com
☑ Email: HALangford@tyleband.com

Customer: Tighe & Bond Inc
Address: 213 Court Street #1100
Middletown CT

Project: Shuttle Meadow PS
Report to: Haley Langford / Cass Wath / Peter Aleo
Invoice to: Tighe & Bond Westfield
QUOTE # DAS Pricing

Project P.O: 25-0059-023A

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature: Peter Aleo Date: 9/29/22

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe **OIL**=Oil
B=Bulk **L**=Liquid **X** = GW (Other)

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	ETPH	VOC	PAHs	RCRA Metals	MS/MSD*	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( ) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [☑] HCL	GL Amber 1000ml [☑] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml [ ] 1000ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
45903	B-1-GW	GW	9/29/22	1430	X	X	X	X						3	3			1			

Relinquished by:	Accepted by:	Date:	Time:
	T&B Fridge	~~9/29/22~~ 9/30/22	1720
		9/30/22	1100
		9/30/22	11:50

Comments, Special Requirements or Regulations:

**MS/MSD are considered site samples and will be billed as such in accordance with the prices quoted.*

Turnaround Time:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ (Residential) Direct Exposure
☐ (Comm/Industrial) Direct Exposure
☐ GA Leachability
☐ GB Leachability
☐ GA-GW Objectives
☐ GB-GW Objectives

CT
☒ RCP Cert
☒ GW Protection
☒ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1 ☐ MWRA eSMART
☐ GW-2 ☐ S-1 10% CALC
☐ GW-3
☐ S-1 GW-1 ☐ S-1 GW-2 ☐ S-1 GW-3
☐ S-2 GW-1 ☐ S-2 GW-2 ☐ S-2 GW-3
☐ S-3 GW-1 ☐ S-3 GW-2 ☐ S-3 GW-3
☐ SW Protection

State where samples were collected: CT

Data Format
☐ Excel
☒ PDF
☐ GIS/Key
☐ EQuIS
☒ Other Environdata

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☒ Phoenix Std Report
☐ Other

* SURCHARGE APPLIES

PEL-126 REV. 06/20

SECTION 00410

FORM FOR GENERAL BID

PROJECT IDENTIFICATION:

Shuttle Meadow Pump Station Rehabilitation

TABLE OF ARTICLES

ARTICLE 1 - BID RECIPIENT

1.1 This Bid is submitted to:

Town of Plainville, Town Manager

One Central Square, Plainville, CT 06062

1.2 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 - BIDDER'S ACKNOWLEDGEMENTS

2.1 Bidder accepts all of the terms and conditions of the Advertisement for Bids and Instructions to Bidders, including without limitation, those dealing with the disposition of Bid deposit. The Bid will remain subject to acceptance for 120 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 - BIDDER'S REPRESENTATIONS

3.1 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents and hereby acknowledges the receipt of all Addenda.

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 - BIDDER'S CERTIFICATION

4.1 Bidder certifies that, under penalty of perjury, Bidder is not presently debarred from doing public construction work in the State of Connecticut under the provisions of Section 31-53a of the Connecticut General Statutes or any other applicable debarment provisions of any other chapter of the General Statutes or any rule or regulation promulgated thereunder; and is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

4.2 Bidder hereby certifies under the penalties of perjury, to the best of Bidder's knowledge and belief, that Bidder has filed all State tax returns and paid all State taxes required by law.

4.3 Bidder certifies that, under the penalties of perjury, this Bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the

word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

4.4 Bidder certifies that, under penalties of perjury, there have been no substantial changes in Bidder's financial position or business organization other than those changes noted within the application since the applicant's most recent prequalification statement and that the Bid is in all respects bona fide, fair and made without collusion or fraud with any other person. "Person" here means any natural person, joint venture, partnership, corporation or other business or legal entity which sells materials, equipment or supplies used in or for, or engages in the performance of, the same or similar construction, reconstruction, installation, demolition, maintenance or repair work or any part thereof.

4.5 Bidder certifies that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.

4.6 Bidder certifies that Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.

4.7 Bidder certifies that Bidder has not solicited or induced any individual or entity to refrain from bidding.

4.8 Bidder certifies that Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph:

A. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

B. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of the Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

C. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

D. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 - BASIS OF BID

5.1 Bidder proposes to furnish all labor and materials required for construction of the Shuttle Meadow Pump Station Rehabilitation, Plainville, CT in accordance with the accompanying Bidding Documents prepared by Tighe & Bond, Inc., for the Contract Price specified below, subject to additions and deductions according to the terms of the Bidding Documents.

5.2 This Bid includes Addenda numbered _____.

5.3 The proposed Contract Price base bid is:

_____ dollars
(words)

($_____)
(figures)

5.4 The sub-division of the proposed Contract Price (Base Bid) is as follows:

Item Number	Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
1	**Shuttle Meadow Pump Station Rehabilitation**, the work of the General Contractor, being all Work other than that covered by following Items (#2 though #12), the lump sum price of: _____ ($)	Lump Sum =	$_____
2	Two submersible Flygt pumps, one control panel, two VFDs, and instrumentation conforming to the specifications, the lump sum price of: Three hundred twelve thousand, seven hundred twenty dollars ($312,720.00)	x Lump Sum =	$312,720.00
3	Rock or Buried Concrete Excavation, per cubic yard, the price of: _____ ($)	x 100 c.y. =	$_____
4	Disposal of Excess Contaminated Soil, per cubic yard, the price of: _____ ($)	x 250 c.y. =	$_____
5	Test Pit, per cubic yard, the price of: _____ ($)	x 30 c.y. =	$_____

6	Repair of spalled and/or scaled and/or hollow sounding concrete from a distance 0 inches - 4 inches deep, per square foot, the price of: _____ ($)	X 150 s.f. =	$_____
7	Repair of cracks in concrete, per linear foot, the price of: _____ ($)	X 150 LF =	$_____
8	Cost of pump spare parts including one submersible pump, one impeller, one insert-ring, and two basic repair kits, the lump sum price of: One hundred two thousand, one hundred seventy-five dollars ($102,175.00)	Lump Sum =	$102,175.00
9	Utility Allowance for gas, electric, and water services, the price of: One hundred thousand dollars ($100,000)	Allowance =	$100,000
10	Independent Testing Lab as directed by the Engineer, the price of: Ten thousand dollars ($10,000)	Allowance =	$10,000
11	Disposal of Excess Polluted Soil, per cubic yard, the price of: _____ ($)	x 150 c.y. =	$_____
12	Police Detail Allowance, the price of: Six thousand dollars ($6,000)	Allowance =	$6,000

ARTICLE 6 - TIME OF COMPLETION

6.1 Bidder agrees that the Work will be substantially completed and ready for final payment in accordance with paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.2 Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times as stated in the Agreement.

ARTICLE 7 - ATTACHMENTS TO THIS BID

7.1 The following documents are attached to and made a condition of this Bid:

A. Bid deposit in the amount of _____ dollars ($_____ _____), consisting of a bid bond in the amount of five percent of the total amount of Bid

B. Evidence of authority to sign

C. Clean Water Fund Memorandum 2016-003: DBE Subcontractor Participation

D. Plainville Drug and Alcohol Testing Program Compliance Certification

E. List of Project References with contacts, project amount and month and year completed

F. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids

G. Department of Administrative Services Prequalification Certificate

H. Department of Administrative Services Update (Bid) Statement

I. List of Major Subcontractors

J. Evidence of Bidder's qualifications in accordance with Article 3 of Section 00200

K. A list of adversarial proceedings in which the bidder is or was a party within the past 10 years that relate to the procurement or performance of any public or private construction contract together with a brief statement as to outcome if concluded or status if pending.

L. A list of any projects on which the firm was terminated or failed to complete the work within the past 10 years, including a brief explanation for each instance listed.

M. The year of organization and if a corporation, when incorporated and how many years you have been contracting under this present name or trade name

N. Upon request, provide a financial statement, banking references, credit available and any other information to the Owner.

ARTICLE 8 - BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

_____

By:
[Signature] _____

[Printed name] _____
(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:
[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

_____

_____

_____

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

_____

Bidder's License No.: _____
(where applicable)

END OF SECTION

J:\P\P0659 Plainville, CT\023_Shuttle Meadow WW PS\Design\Specs\00410-LS.docx

SECTION 01290

APPLICATION AND CERTIFICATE FOR PAYMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Definition and description of measurement and payment to be used for the Work

2. Payment procedures

3. Payment requests for stored materials

B. Related Requirements

1. Section 01295 - Schedule of Values

1.2 GENERAL

A. The following paragraphs describe payment procedures for the work to be done under the respective items in the Bid Form.

B. Each lump sum and unit price will be deemed to include an amount considered by the Contractor to be adequate to cover the Contractor's overhead and profit for each separately identified item.

C. Except as provided for in Section 01295, no separate measurement or payment will be made for Work called for in Division 0 or Division 1 of the Contract Specifications, unless specifically covered under the Bid items listed below. All costs associated with this Work will be considered incidental to the Contract Bid price.

D. Division 2 through Division 16 Work will be measured and paid for at the Contractor's unit Bid price or lump sum Bid price as indicated on the Bid form. Those payable Work items, and related prices as Bid, will be the basis for all compensation to the Contractor for Work performed under this Contract. Work not specifically included as a Bid item, but which is required to properly and satisfactorily complete the Work is considered ancillary and incidental to the Bid item Work, and payment for such Work is considered to be included in the values as Bid for payable items. Compensation for all unit Bid price Work will be made based on the measured quantity of Work under the appropriate Bid items.

1.3 LUMP SUM ITEMS

A. Each lump sum price stated in the Bid form shall constitute full compensation for all labor, equipment and materials necessary and required to complete the work specified under that particular item, and also all costs for doing related work as set forth in the Contract Documents or implied in carrying out their intent.

B. Item 1 - Shuttle Meadow Wastewater Pump Station Rehabilitation

1. Measurement

a. There will be no measurement of quantities for lump sum items. Periodic partial payments for this Work, included under the Agreement, shall be based on the percent completion of each work item listed in the Schedule

of Values provided under Section 01295 estimated by the Contractor and approved by the Engineer.

2. Payment

a. The lump sum payment shall be full compensation for furnishing all labor, materials, tools, equipment, and services necessary for the construction of the Shuttle Meadow Wastewater Pump Station Rehabilitation, excluding Items 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12 in its entirety as detailed in the Contract Documents.

1.4 UNIT PRICE ITEMS

A. Each unit price stated in the Bid form shall constitute full compensation for all labor, equipment and materials necessary and required to complete the Work specified under that particular item, and also all costs for doing related work as set forth in the Contract Documents or implied in carrying out their intent.

B. Payment of the unit price items will only be made for the actual quantity of Work performed in accordance with the Contract Documents.

C. Item 2 – Two Submersible Flygt pumps, one control panel, two VFDs, and instrumentation conforming to the specifications.

1. Measurement

a. Measurement for this will be on a lump sum basis once all items are installed, testing, trained on and operating for at least two weeks with no alarms or issues.

2. Payment

a. Payment of the item will be full compensation for all delivery, furnishment, installation, testing and intended operation, and all labor, equipment and materials required for or incidental to the work.

D. Item 3 – Rock/Buried Concrete Excavation

1. Measurement

a. Measurement for rock/buried concrete excavation will be on a cubic yard basis as measured in the field by the Engineer.

b. Rock with earth overburden shall be stripped of earth and exposed so that the rock can be profiled prior to removal. Excavation between the surface and the top of rock will be paid for under the lump sum item.

2. Payment

a. Payment of the bid price for rock excavation will be full compensation for all excavation, backfill, compaction, removal and proper off-site disposal of the material, and all labor, equipment and materials required for or incidental to the work.

b. Boulders less than 1 cubic yard will be paid for as part of the lump sum item and will not be paid for as part of rock excavation.

c. Payment for rock excavation will be at the bid price regardless of the depth at which it is encountered.

E. Item 4 – Disposal of Excess Contaminated Soil

1. Measurement

a. Measurement for contaminated soil disposal will be on a cubic yard basis as measured in the field by the Engineer.

2. Payment

a. Payment of the bid price for contaminated soil disposal will be full compensation for all excavation, backfill, compaction, removal and proper off-site disposal of the contaminated material, and all labor, equipment and materials required for or incidental to the work. This includes all wait times for the material to be held for testing and the lab results.

F. Item 5 – Test Pits

1. Measurement

a. Measurement for test pits will be on a cubic yard basis as approved and measured in the field by the Engineer.

2. Payment

a. Payment of the Bid price for test pits will be full compensation for all cutting of surfaces, excavation, backfill (with adjacent acceptable material), compaction, dewatering, sheeting and bracing, required measurements, time to expose for review, backfill, restoration and all labor, equipment and materials required for or incidental to the Work.

G. Item 6 – Repair of spalled and/or scaled and/or hollow sounding concrete, 0 – 4 inches deep

1. Measurement

a. Measurement for repairing spalled and/or scaled and/or hollow sounding concrete from a distance of 0 inches to 4 inches deep will be on a square foot basis as approved and measured in the field by the Engineer.

2. Payment

a. Payment of the Bid price for this item will be full compensation for all cutting, disposal, cleaning, repairs, required measurements, and all labor, equipment and materials required for or incidental to the Work.

H. Item 7 - Repair of cracks in concrete

1. Measurement

a. Measurement for repairing concrete cracks in concrete will be on a linear foot basis as approved and measured in the field by the Engineer.

2. Payment

a. Payment of the Bid price for this item will be full compensation for all drilling, injections, concrete rubbing, required measurements, and all labor, equipment and materials required for or incidental to the Work.

I. Item 8 – One Spare Submersible Flygt pump matching the same material and testing as the installed pumps.

1. Measurement

a. Measurement for this will be on a lump sum as once all items are furnished and factory tested.

2. Payment

a. Payment of the item will be full compensation for all fabrication, factory testing, delivery, furnishment, and all labor, equipment and materials required for or incidental to the Work.

b. If the Notice to Proceed is not provided by the end of December of 2023, a 2% escalation in pricing is allowed.

J. Item 9 – Utility Allowance

1. Measurement

a. There will be no measurement of quantities for allowance items. This item is an allowance for reimbursement to the Contractor.

2. Payment

a. The Contractor shall carry an allowance in the bid to cover all Utility Company charges required for natural gas, electric, phone, cable, and water service work in and around the Work site as shown on the Contract Drawings. Fees and costs of services by electric and natural gas utility companies for the Work as shown and specified at the Shuttle Meadow Pump Station is to be paid out of the Utility Allowance.

b. Payment shall be based on the actual utility company charges with no markup based on invoices submitted to the Engineer.

c. Payment shall be in accordance with the paid utility company's invoices only for that work required to be performed and as is normally performed by the utility company's own personnel.

d. Periodic partial payments for this Work, included under the Agreement, shall be based on the actual charges incurred during the pay period.

e. This allowance shall not be used to pay for temporary utilities for the Contractor's use.

K. Item 10 – Independent Testing Laboratory Allowance

1. Measurement

a. There will be no measurement of quantities for allowance items. This item is an allowance for reimbursement to the Contractor.

2. Payment

a. The Contractor shall carry an allowance in the bid to cover all Independent Testing Lab charges required for in and around the Work site as shown on the Contract Drawings. Fees and costs of services by testing companies for the Work as shown and specified at the Shuttle Meadow Road Pump Station are to be paid out of the Independent Testing Laboratory Allowance.

b. Payment shall be based on the actual testing lab charges with no markup based on invoices submitted to the Engineer.

c. Payment shall be in accordance with the paid testing lab's invoices only for that work required to be performed and as is normally performed by the testing lab's own personnel.

d. Periodic partial payments for this Work, included under the Agreement, shall be based on the actual charges incurred during the pay period.

L. Item 11 – Disposal of Excess Polluted Soil

1. Measurement

a. Measurement for polluted soil disposal will be on a cubic yard basis as measured in the field by the Engineer.

2. Payment

a. Payment of the bid price for polluted soil disposal will be full compensation for all excavation, backfill, compaction, removal and proper off-site disposal of the polluted material, and all labor, equipment and materials required for or incidental to the work. This includes all wait times for the material to be held for testing and the lab results.

M. Item 12 – Police Detail Allowance

1. Measurement

a. There will be no measurement of quantities for allowance items. This item is an allowance for reimbursement to the Contractor.

2. Payment

a. The Contractor shall carry an allowance in the bid to cover all Police Detail charges required for in and around the Work site as shown on the Contract Drawings. Fees and costs of services by police departments for the Work as shown and specified at the Shuttle Meadow Road Pump Station are to be paid out of the Police Detail Allowance.

b. Payment shall be based on the actual police department charges with no markup based on invoices submitted to the Engineer.

c. Payment shall be in accordance with the paid police department's invoices only for that work required to be performed and as is normally performed by the police department's own personnel.

d. Periodic partial payments for this Work, included under the Agreement, shall be based on the actual charges incurred during the pay period.

1.5 PAYMENT PROCEDURES

A. Informal submittal: Unless otherwise directed by the Engineer:

1. Make an informal submittal of request for payment by filling in, with erasable pencil, pertinent portions of EJCDC C-620, Contractor's Application for Payment, plus continuation sheet or sheets.

2. Make this preliminary submittal to the Engineer at the last regular job meeting of each month.

3. Revise the preliminary submittal as approved by the Engineer and incorporate the approved payments into the formal submittal.

B. Formal submittal: Unless otherwise directed by the Engineer:

1. Make formal submittal of request for payment by filling in the agreed data, by typewriter or electronically on EJCDC C-620, Contractor's Application for Payment, plus continuation sheet or sheets.

2. Sign and notarize the Application for Payment.01290

3. Submit the original of the Application for Payment, plus six identical copies of the continuation sheet or sheets, to the Engineer.

4. The Engineer will compare the formal submittal with the approved informal submittal and, if acceptable, will sign the Contractor's Application for Payment, and present the Application to the Owner.

5. Provide a signed and notarized Certificate for Stored Materials and proof of storage in a dry, watertight, heated and insured warehouse facility.

1.6 PAYMENT REQUESTS FOR STORED MATERIALS

A. Requests for payment for stored materials shall be made in accordance with Section 00700 and shall be accompanied by the attached "Certificate for Stored Materials" form. Payment for stored materials shall not exceed the value actually paid by the Contractor for the stored materials as evidenced by the accompanying bill of sale, invoice, or other documentation.

B. Partial payment requests for materials stored or so-called "engineering costs" by equipment manufacturers will not be allowed. All such costs shall be distributed proportionately among the various items of equipment/hardware to be furnished.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

J:\P\P0659 Plainville, CT\023_Shuttle Meadow WW PS\Bidding\Addendum 3\01290.docx

CERTIFICATE FOR STORED MATERIALS

_____
Tighe & Bond Project No.

We, _____, request payment for materials and/or equipment not incorporated in the work included under our firm's contract with _____ as listed below.

We hereby certify under penalty of perjury, that the materials not incorporated in the work have been delivered and are securely stored at the site or at _____ and that we have title to said materials free and clear of all Liens, as evidenced by the attached bill of sale, invoice, or other documentation.

We also certify that an inventory of said materials and/or equipment has been compiled for the purposes of this monthly partial payment request. This list of materials and/or equipment, including unit prices for said material not incorporated in the work for which payment is hereby requested, consisting of _____ pages and dated _____, is signed and attached hereto.

We acknowledge that payments made based on this request for materials and/or equipment not incorporated in the work does not relieve the contractor of its responsibility for furnishing all materials and equipment required for the satisfactory completion of the project pursuant to the contractual requirements.

We further certify that we can and will adequately protect said materials and/or equipment until they are incorporated in the work; that they meet the requirements of the specifications, and that they will be needed for incorporation in the work in the near future.

IN WITNESS WHEREOF, we, the said _____ hereunto set our hand and seal this _____ day of _____, 20__.

_____
Contractor's Firm Name

SIGNED, SEALED AND DELIVERED IN THE PRESENCE OF

By_____

Title _____

_____
Notary Public

SCHEDULE OF STORED MATERIALS

Job No. _____
Contract No. _____
Contractor: _____
Location: _____
_____

Date _____
Pay Estimate _____

Item	Description	Supplier/Manufacturer	Quantity Stored and not Incorporated	Unit $	Certified Value

Signature: _____
Contractor's Principal

Total Amount Due for Stored Materials _____

Title: _____

SECTION 11312

SUBMERSIBLE WASTEWATER PUMPING EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. All labor, equipment and materials necessary to furnish, install, test and place in operation submersible wastewater pumping units, controls and other ancillary equipment, designed for raw wastewater service, as shown on the Drawings and specified herein.

2. This Section includes pumps and related equipment for the Shuttle Meadow Pump Station (two wet pit submersible pumps and one spare pump).

3. Pump Support and Lift-out system for **two** wet pit submersibles.

4. Variable Frequency Drives. Coordinate of Equipment Supply with Electrical Design.

5. Pump Control Panel with electrical components meeting the requirements specified in Division 16 and related instrumentation meeting the requirements of this section.

6. Equipment specified under this section shall be coordinated by the Precast Structure Manufacturer as part of the complete turn-key package specified in Section 03485 / 13121. Coordinate with Precast Structure Manufacturer to provide a fully functioning submersible pumping facility.

B. Related Sections

1. Section 01310 – Coordination

2. Section 01140 – Work Restrictions

3. Section 01330 – Submittals

4. Section 01770 – Closeout Procedures

5. Section 09900 – Painting

6. Section 11000 – Equipment - General

7. Section 15125 – Meters and Gauges

8. Division 15 – Mechanical

9. Division 16 – Electrical

1.2 REFERENCES

A. General - All electrical components shall conform to the requirements of the National Electric Code and must be listed and labeled "Approved" by Underwriters Laboratories (UL).

B. ANSI/HI (American National Standards Institute/Hydraulic Institute) Pump Standards

C. AFBMA (Anti-Friction Bearing Manufacturer Association)

D. ANSI (American National Standards Institute)

1. ANSI B16.1 – Cast Iron Flanges and Flanged Fittings

E. ASTM (American Society of Testing and Materials)

1. ASTM A48 - Standard Specification for Gray Iron Castings

F. ISO (International Organization for Standardization)

G. NEMA (National Electrical Manufacturers Association)

1.3 SYSTEM DESCRIPTION

A. Shuttle Meadow Pump Station

1. The equipment, which shall be complete in every detail as herein specified, includes, but is not necessarily limited to, two submersible, wet pit wastewater pumps, integral motors with power and monitoring cables, pump controls panels and related instrumentation, and other related accessories.

2. The pumping system shall include base elbows, pump retrieval guides, supports and grab link system.

3. The two pumping units will withdraw sewage directly from the pump station wet wells. The pumps will discharge through a common header.

1.4 SUBMITTALS

A. Comply with Section 01330 – Submittal Procedures

B. Product Data

1. For each type of product specified, submit literature and drawings describing the equipment in sufficient detail, including parts list and materials of construction, to indicate full conformance with the Specifications. This information shall be prepared specifically for the pumps and related equipment proposed.

2. Modbus I/O map for pump control panel

C. Specification Summary

1. A marked-up version of this specification, which clearly indicates compliance with the provisions of this specification as well as any exceptions or deviations from the requirements of this specification. Contractor shall carefully review each paragraph and mark it with either a check indicating the submittal is in compliance with the requirements, or an "X" if the requirement cannot be met. For any paragraph marked with an "X", include a description of why the requirement is not applicable or a description of any deviations from the requirements.

D. Shop Drawings

1. Manufacturer's rating curves showing pump characteristics and pump data. These curves shall include plots of total dynamic head (ft) versus flow rate (gpm), horsepower (electrical) versus flow rate (gpm), efficiency (water to wire) versus flow rate (gpm) and required net positive suction head ($NPSH_R$ versus flow rate (gpm). Catalog sheets showing a family of curves will not be acceptable. Pump data shall include pump model and type, total pumping unit weight, maximum

starts per hour allowable without pump or motor issues, motor rated horsepower, voltage, and current, and efficiencies (at full load, ¾ load, ½ load) and required minimum submergence (for wet pit pumps).

2. Submit multiple pump curves covering speed ranges for the proposed variable speed pumps. Each curve shall plot total dynamic head (ft) versus flow rate (gpm), horsepower versus flow rate (gpm), and efficiency versus flow rate (gpm). This information shall be prepared specifically for the pumps proposed.

3. Details of fabrication, erection, and adjoining equipment interfaces for all equipment furnished under this Section.

4. Certified dimensional drawings of each item of equipment and auxiliary apparatus to be provided.

5. Certified foundation, pump support, and anchor bolt plans and details.

6. Listing of spare parts to be provided.

7. Manufacturer's electrical requirements for pumps and motor and pump monitoring system. This shall including ladder-type wiring diagrams for interlock and control wiring, clearly indicating required field connections.

8. Submit Pump Control Panel drawings and documentation on control panel components.

9. Bearing life calculations.

E. Quality Assurance/Control Submittals

1. A statement that each pump will function properly as installed with respect to the suction piping and layout as shown on the Drawings.

2. A "Letter of Compliance" stating that the characteristics of each pump (specifically naming the respective pumps), are such that they will not overload the specified motor horsepower under any head condition when operating at the specified maximum speed, and that the motor will not overheat at maximum turndown.

3. A certificate from the pump manufacturer stating that the installation of the pumping units is satisfactory, that the equipment is ready for operation, and that the operating personnel have been suitably instructed in the operation, lubrication and care of each unit. The report shall also confirm that nothing in the installation will render the manufacturer's warranty null and void.

F. Test and Evaluation Reports

1. Certified copies of all required test results shall be submitted to the Engineer for approval prior to shipment.

2. Certified factory test data including performance curves for each of the proposed pumps from shut off to maximum capacity, showing total dynamic head, efficiency (wire-to-water), brake horsepower (BHP). Data of tests and test points and results are required. All certified factory performance tests shall be performed according to the latest test ANSI/HI 11.6 standard. Tests shall demonstrate that the specified design point specified in the Schedule for that pump has been met within the specified acceptance criteria.

3. Certified motor factory test data including winding resistance and insulation resistance.

4. Vibration tests performed in the field demonstrating compliance with HI standards.

5. Field test reports.

G. Closeout Submittals

1. Operation and Maintenance Manuals

a. Provide O&M Manuals and Equipment Start-up Reports per Sections 01770 and 11000.

b. Installation and operation instructions.

2. Warranty Documentation

3. Spare Parts

a. Furnish with each pump, the manufacturer's standard set of spare parts including at least the following:

1) One spare pump and motor to be placed in the Electrical Building for future use.

2) One set of all gaskets

3) One impeller

4) One bottom plate or suction cover insert ring (as applicable)

5) One hard iron insert ring (if applicable)

6) One set of mechanical seals

7) One set of bearings

8) One O-ring kit

9) One set of wear rings

10) Other spare parts as recommended by manufacturer

b. Furnish with each Pump Control Panel, the following spare parts

1) One type of each fuse

2) Provide one spare lens of each color

3) Spare parts required per Section 16137

c. Spare parts shall be furnished packed in suitable containers and clearly labeled designating the contents and the unit for which they are intended.

d. Furnish all special tools required for the maintenance of the new pumps.

1.5 QUALITY ASSURANCE

A. General

1. The pump manufacturer shall also furnish and be responsible for the electric motors, in accordance with Division 16. The pumping equipment shall be adequately and safely designed and constructed for heavy duty use and continuous operation (where required) at the pressures and under all conditions of service to which they may be subjected.

2. To assure unity of responsibility, the pumps, motors, and bases shall be furnished and coordinated by the pump manufacturer to assure a matched and working system. The pump manufacturer shall assume responsibility for the satisfactory installation and operation of the entire pumping system including pumps, motors, and bases.

3. The pumps covered under this Section are intended to be pumping equipment of proven ability as manufactured by a reputable manufacturer having experience in the production of such pumps. The pumps furnished shall be designed, constructed, and installed in accordance with the best practice and methods, and shall operate satisfactorily when installed. Pumps shall be manufactured in accordance with the Hydraulic Institute Standards. Each type of pump shall be the product of one manufacturer.

4. These Specifications direct attention to certain features of the pumping units, but do not purport to cover all the details of their design. The equipment furnished shall be designed and constructed equal to high quality pumping equipment manufactured by such firms as are mentioned hereinafter for the various types of pumps or approved by the Engineer.

B. Qualifications

1. The pumps specified under this Section shall be furnished by a manufacturer who is fully experienced, reputable, and who has such pumps, or similar units, in successful operation for a minimum of five years.

2. The pumps and motors shall be produced by the same manufacturer.

1.6 DELIVERY, STORAGE AND HANDLING

A. All parts shall be properly protected so that no damage or deterioration will occur during a prolonged delay from the time of shipment until installation is completed and the units and equipment are ready for operation. On-site precautions must be taken by the Contractor to ensure adequate protection during storage.

1.7 WARRANTY

A. Final acceptance of all equipment furnished under this Section will be withheld until after the installation and satisfactory field testing. The Contractor shall warranty the Work against defects of any kind for a period of one year after final testing and acceptance, or Substantial Completion, whichever occurs later.

B. In addition to the one-year warranty described above, the pump manufacturer shall provide a full 5-year, non-prorated warranty on all pumps (pumps and motors) supplied. Manufacturer's warranty shall be valid for 5 years from the date of start-up [or 5 year and 6 months from the date of shipment] for each unit and shall cover 100% of the cost of repairs for parts and labor (shop labor to include all repair labor, with the exception of labor to remove the pump(s) and transport).

C. Within the warranty period, the manufacturer shall (at his own expense) promptly repair or replace any items as part of the delivered units which fail or have a significant

reduction in performance due to a manufacturing defect (not including regular wear of wear parts).

D. Should the painting system fail or bubbling occur due to a defect in the painting system within the pump(s) warranty period, the pumps shall be pulled, prepped, repainted and reinstalled at the manufacturer's expense, with no cost to the owner.

PART 2 PRODUCTS

2.1 GENERAL

A. The pumping units required under this Section shall be complete including pumps, motors, and specified accessories. The pump manufacturer shall be responsible for the furnishing and performance of all equipment.

B. Parts shall be so designed and proportioned as to have liberal strength, stability, and stiffness and to be especially constructed for the work to be done. Ample room and facilities shall be provided for inspection, repairs, and adjustment.

C. Furnish all necessary foundation bolts, plates, nuts, and washers. Anchor bolts shall be Type 316 Stainless Steel, sized by the equipment manufacturer.

D. Brass or stainless steel nameplates giving the name of the manufacturer, the rated capacity, head, speed, serial number, and all other pertinent data shall be attached to each pump and motor. A special data plate shall be attached to the pump frame, which shall contain identification of frame and bearing numbers.

E. Comply with the requirements of Section 11000 (Equipment – General).

F. Provide lifting handle or lugs for equipment weighing over 100 pounds.

G. Electrical devices and equipment to be UL rated.

2.2 MANUFACTURERS

A. Pumping equipment covered by this Section shall be manufactured Xylem (Flygt). No substitutions or "or equals" will be accepted. The listing of a specific pump model herein in no way relieves the pump supplier from complying with all other requirements of this Section.

2.3 PERFORMANCE REQUIREMENTS

A. Refer to the Schedule(s) at end of this Section. Pumps shall be able to achieve the specified range of flows in gallons per minute (gpm) for specified Total Dynamic Head (TDH) and Net Positive Suction Head Available ($NPSH_A$). Pumps shall be suitable for continuous and intermittent duty operation unless otherwise specified. Pumping unit performance and construction shall conform to the ratings and nomenclature of the ANSI/HI Pump Standards.

2.4 SUBMERSIBLE-TYPE WASTEWATER PUMPS

A. Pump Assembly

1. Construction

a. Pumps shall be designed for handling raw wastewater. Major pump components shall be of ASTM A48, Class 35B or Class 40, with smooth surfaces devoid of blow holes or other irregularities. The casing shall have

an integrally cast centerline discharge flange connection faced and drilled in accordance with 125-lb ANSI B16.1 Standard.

b. The lifting handle or lugs shall be constructed of stainless steel. All exposed nuts or bolts shall be Type 316 stainless steel. All metal surfaces coming into contact with the pumped fluid, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin or high solids epoxy paint finish on the exterior of the pump.

c. Sealing design for the pump/motor assembly shall incorporate metal to metal contact between machined surfaces. Critical mating surfaces where a watertight seal is required shall be machined and fitted with Nitrile or Viton rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

d. Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression are not acceptable. No secondary sealing compounds shall be used.

2. Impellers

a. Impellers shall be hard iron, N-impeller non-clog design capable of passing the minimum spherical solids size specified.

b. The design of the pump and impeller arrangement shall promote self-cleaning, minimize clogging, be capable of handling solids, fibrous stringy material, heavy sludge, and other matter normally found in wastewater, and still promote efficiency. The impeller shall be dynamically balanced to provide smooth vibration free operation.

c. The impeller leading edges shall be mechanically self-cleaned upon each rotation as they pass across a spiral groove located on the volute suction. The screw-shaped leading edges of the gray iron impeller shall be hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in raw unscreened wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by means of a single trim screw. The impeller shall be locked to the shaft and held in place by a stainless steel bolt, which cannot be loosened by torque from either forward or reverse rotation.

3. Volute

a. The pump volute shall be a single piece of gray cast iron, ASTM A-48, Class 35B or ASTM A-48, Class 40, non-concentric design with centerline discharge and smooth passages of sufficient size to pass any solid that may enter the impeller. Minimum inlet and discharge size shall be as specified under Section 2.2 Performance Requirements. Coordinate with piping design and confirm pump size will work with proposed piping layout. Additional piping changes to accommodate selected pumps are to be included in the scope.

b. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged grooves. The spiral grooves shall provide trash release pathways and sharp edges across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall be of the same material as the impeller and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

4. Pump Shaft

a. The pump and motor shaft shall be a rigid integral unit, made from ASTM A479 S43100-T stainless steel or 420 stainless steel, of sufficient size to transmit the full driver horsepower with a liberal safety factor, accurately machined over its entire length and free from any harmful or damaging vibrations. Couplings shall not be acceptable. Shaft shall be adequately designed to meet the maximum torque required at any normal start-up condition or operating point in the system. Shaft shall be polished as necessary and have accurately machined shoulders to accommodate bearings, seals, and impeller. Carbon steel or chrome plated shafts shall not be considered adequate or equal.

5. Bearings

a. Each pump shall be provided with bearings both radial and thrust, of the anti-friction type, of ample size to carry all loads imposed under continuous operation, minimizing shaft deflection and excessive heat buildup. Bearings shall be permanently lubricated. Bearings shall be designed in accordance with the ABMA standards for a minimum L_{10} bearing life of 50,000 hours at any usable portion of the pump curve.

6. Seal Assembly

a. Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in a lubricant reservoir that hydro-dynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and lubricant chamber, shall contain one stationary and one positively driven rotating corrosion resistant tungsten or silicon carbide ring. The upper secondary seal, located between the lubricant chamber and the motor housing, shall contain one stationary and one positively driven rotating, corrosion resistant tungsten or silicon carbide ring.

b. Each seal interface shall be held in place by its own spring system. The seals shall not depend upon direction of rotation for sealing. Seals shall not require maintenance or adjustment.

7. Lubricant Chamber

a. Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely on the pumped media for lubrication.

b. A moisture sensor probe shall be installed to detect the presence of water in the stator chamber. A corresponding relay designed to be mounted in any control panel shall be used in conjunction with the seal probe to detect moisture and energize a warning annunciation device in the control panel and/or cause the pump to shut down.

B. Motor

1. The pump motor shall be an induction type squirrel cage design. The rotor and stator shall operate in an air-filled and watertight NEMA B type housing. The stator windings and leads shall have a Class H insulation rating (365°F). The motor shall be designed for continuous duty while pumping fluids up to 104°F.

2. Motors shall be capable of handling a minimum of 15 equally spaced starts per hour when started across the line.

3. Motors shall meet the efficiency standard specified on the schedule.

4. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of bolts, pins, or other fastening devices requiring penetration of the stator housing shall not be acceptable.

5. Thermal switches shall be embedded in each phase of the windings and set to open at 260°F. The thermal switches shall be suitable for use in conjunction with and supplemental to external motor overload protection to protect the motor from overload. See Pump Protection paragraph for more information.

6. The motor service factor as defined by NEMA MG1 shall be a minimum of 1.15 when operating across the line. The motor shall have a voltage tolerance of plus or minus 10%.

7. The motor horsepower shall be selected such that the unit is non-overloading over the entire range of the pump performance. The motors shall have capacity sufficient to operate the pumps throughout the operating range without exceeding the nameplate rating for current and power, unless otherwise is specifically indicated.

8. Motor shall be provided with lifting lugs or handle.

9. The motor and pump shall be produced by the same manufacturer.

10. See schedule at end of specification for additional requirements.

C. Cooling System

1. Wet Pit Pumps

a. The pump motors shall be sufficiently cooled by the surrounding pumped media without the need for a cooling jacket.

D. Motor Power Cables

1. Motor power cables shall be properly selected and sized for the electrical characteristics and loads and be of sufficient length to suit the installation without requiring splices. The pump power/control cable shall be FM or UL approved for use in hazardous locations and comply with the National Electric Code and

State Specific Codes. The exterior jacket shall be capable of continuous submergence in sewage.

2. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.

3. The cable entry design shall not require specific torque requirements to ensure a watertight seal.

4. The cable entry seal shall be comprised of a single elastomer grommet with washers located on either side. A compression fit of the grommet seals the cable and entry from the exterior fluid. The cable entry assembly shall allow easy replacement of cable by using the same cable entry grommet.

5. The cable entry junction chamber shall be separated from the motor by a waterproof sealed terminal board.

6. Provide motor with sufficient cable length to reach termination point shown on the drawings with at least 10% excess cable (coiled up).

2.5 PUMP SUPPORT SYSTEMS

A. Wet Pit Pump Support and Lift Out System

1. Pump Supports and Connection

a. The pumps shall be supplied with a mating cast iron discharge connection. The pumps shall be automatically and firmly connected to the discharge connection, guided by at least one stainless steel guide rail extending from the top of the station to the discharge connection. Intermediate brackets shall be used for wet wells deeper than 20 feet. Lower, intermediate, and upper brackets shall be stainless steel. There shall be no need for personnel to enter the wet pit. The entire weight of the pump/motor shall be borne by the pump discharge elbow. No portion of the pump/motor unit shall directly bear on the well floor.

b. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact, or by a field replaceable Nitrile rubber profile gasket or O-ring. The pump shall be automatically connected to the discharge piping when lowered into position.

2. Lift-out system

a. A slide away coupling shall be provided for each wet pit submersible pump to allow the pump to be installed or removed without requiring personnel to enter the wet well. The coupling shall consist of a discharge elbow securely fastened to the floor of the chamber, a moveable bracket that bolts to the pump discharge flange and mates with the discharge elbow, and a system of guide pipes to guide the pump and moveable bracket from the discharge elbow to the access cover in the top of the chamber. Guide pipes shall be securely affixed to top of concrete structure hatch frame.

b. The lift-out system shall consist of the following components:

1) Guide rails

2) Intermediate guide rail brackets

3) 1/4-inch Stainless Steel Lifting chain (no cable)

4) Stainless Steel hook in lieu of standard plastic (SS Grip Eye)

5) Grab Link System

6) Upper guide rail bracket

7) Slide bracket

8) Rail support/pump discharge elbows

9) Anchor bolts

c. Each guide rail system shall be constructed of schedule 40 type 316 stainless steel rails. Intermediate guide rail brackets shall also be type 316 stainless steel and shall be sized and installed with spacing per the manufacturer's requirements.

d. All rails, brackets, anchor bolts, lifting chain/cable and miscellaneous fasteners for the guide rail system shall be type 316 stainless steel. Lifting chain/cable working loads shall be 100% greater than the weight of each pumping and motor assembly.

e. All anchor bolts shall be 316 stainless steel and shall be of ample size and strength for the purpose intended. All anchor bolts shall be installed in accordance with the manufacturer's instructions.

3. The weight of the pump support and lift out systems for wet pit submersible pumps are not included in the maximum pump weight indicated in the pump schedule.

2.6 HARDWARE, SURFACE PREPARATION, AND PROTECTIVE COATINGS

A. External Hardware

1. All exposed nuts or bolts shall be Type 316 stainless steel.

B. Pump Surfaces

1. All metal surfaces coming into contact with the pumped fluid, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer, or in accordance with the pump manufacturer's recommendations, with a polyester resin or high solids two part epoxy paint finish on the exterior of the pump.

2. The coating shall be resistant to sewage and other chemicals normally found in wastewater.

C. Pump Supports and Related Accessories

1. Surface preparation, and prime painting, and finish painting of fabricated steel pump support bases (where called for on schedule or drawings) and accessories (other than stainless steel or brass) are provided under this Section.

2. Surface preparation shall be SSPC-SP6, commercial blast. Shop prime and finish painting shall be the manufacturer's recommended coating systems for the intended service.

D. Touch up Paint

1. A minimum of one quart of touch-up paint for each painting system shall be furnished for use by the Contractor and then handed over to the Owner.

2.7 PUMP PROTECTION

A. Provide each pump with a Pump Control and Status Monitoring System capable of monitoring the pump's protective devices. Furnish the required relay/control modules that make up this system to the supplier of the pump controls as specified herein or Division 13 or Division 16 as appropriate. Coordinate manufacturers recommendations with pump control design. The pump's (and pump's motor) protective devices shall include the following:

1. Thermal Switches – Three thermal switches, one per stator phase winding and connected in series to monitor the temperature of the motor. (See paragraph above regarding motor requirements). These shall be connected to the motor controls to immediately shut down the pump during a high temperature condition.

2. Detect Moisture – A moisture detection device installed in the seal leakage chamber that will activate if there is excessive leakage into the chamber. A float type set at 50% chamber capacity or resistance type probe are acceptable. This shall be connected to the motor control to signal an alarm and the need to schedule an inspection. This may or may not result in the automatic shutdown of the pump.

B. Provide each pump with wiring in the pump power cables (or separate sensor cables as required) to connect the protective devices to the pump control panel in accordance with the Drawings and as outlined in Division 16.

2.8 PUMP ACCESSORIES

A. Provide all gauges with shut off and bleed cocks and diaphragms as required in Section 15125.

B. Provide discharge pressure gauges for each pump that meet the requirements of Section 15125.

2.9 REQUIRED INSTRUMENTATION AND VFDS

A. Magnetic Flow Meter

1. Tags: FE/FIT-101

2. Magnetic flow meters shall be provided in order to provide local readout of flow rate and transmit to the Pump Control Panel as indicated on the Drawings. The flow meter shall be of the low frequency electromagnetic induction type and the coils shall be excited by a pulsed DC signal. The meter shall be designed for operation on 120 VAC ± 10%, 60 Hz ±5% with a power consumption of less than 15 watts.

3. The same manufacturer shall manufacture flow tubes and transmitters.

4. Flow Transmitter Tag: FIT-101

a. The flow transmitter portion of the magnetic flow meter shall be remote from the flow tube unless otherwise indicated and include both a magnet driver to power the magnet coils and the signal converter electronics. For remote mounted units, provide manufacturer's recommended interconnecting cable for both the driver coil and the signal. Lengths shall be provided as required. Power cables between the flow tube and the

transmitter shall be installed in dedicated RGS conduit separate from all other wiring.

b. The electronics shall be of the solid state, feedback type, utilize integrated circuitry and be microprocessor controlled. The converter shall be provided with a back lighted, dot matrix-type, liquid crystal display for flow and configuration data. The display shall have two rows of not less than 16 alphanumeric characters for instantaneous flow rate in percent or direct engineering units, field selectable, and accumulated total flow. A keypad shall be provided for fast, easy configuration.

c. Display shall provide full diagnostics with a clear message describing any and all faults. The diagnostics shall provide a 4 to 20 mA output calibration function capable of forcing the transmitters 4 to 20 mA output to the zero scale, half scale and full scale values.

d. Input and output signals shall be fully isolated. The converter output shall be 4 to 20 mA dc DC with HART protocol overlaid.

e. The meter shall be hydraulically calibrated to N.I.S.T. Standards at a minimum of 3 flow rates with an accuracy of 0.25% of flow velocities of 1 to 30 feet per second.

1) Submit on specific accuracy (measurement error %) curve showing accuracy vs. flow rate.

f. Provide integral transient protection circuitry.

g. Environmental:

1) NEMA 4X housing.

5. Flow Tube Tag: FE-101

a. Flow tubes shall be constructed of stainless steel. The flow tube and magnetic coils shall be housed in a cast steel housing with secondary containment.

b. Flow tubes shall be supplied with integral welded ANSI Class 150 carbon steel flanges. Flangeless tubes will not be acceptable.

c. The flow tube lining shall be hard rubber.

d. The electrodes shall be Hastelloy C or equal.

e. Environmental:

1) NEMA 4X housing.

f. Provide flange mounted grounding rings.

g. Provide protection washers for liners.

6. Flow Range (4-20 mA Scaling)

a. 0 to 2000 GPM

7. Manufacturers:

a. Rosemount – 8712 remote transmitter, 8732E integral transmitter, 8750W flow tube.

b. Siemens Sitrans FM Series – Mag 6000 Transmitter, Mag 5100W flow tube.

c. Equivalent by Krohne OPTIFLUX 4000 Series.

d. Equivalent by Endress + Hauser Promag W300 Series.

e. Equivalent by ABB WaterMaster Series.

f. Or equal.

B. Pressure-type Level Transducer

1. Tag: LT-101

2. Provide a pressure transducer for the wet well to measure water level depth.

3. Description: small bore submersible pressure transducer.

4. Construction: silicon pressure cell fitted into a stainless steel package with an integral stainless steel barrier diaphragm.

5. Outer Diameter: 1 inch maximum.

6. Output: 4 to 20 mA DC.

7. Accuracy: ±0.25%

8. Vented reference.

9. Provide aneroid bellows for atmospheric pressure compensation. Mount bellows in break-out box as shown on Drawings.

10. Level Range: 0 to 30 feet.

11. Provide factory cable with molded cable seal at necessary length to reach from the bottom of the wet well to the aneroid bellows break-out/junction box.

12. Mount in stilling well as shown on Drawings.

13. Manufacturers:

a. Keller America – LevelGage Series.

b. Equivalent by Siemens – Sitrans P MPS.

c. Equivalent by Endress + Hauser – FMX167.

d. Or equal.

C. Level Sensing Probe

1. Description:

a. Probe consisting of uPVC or CPVC 1¼" diameter (minimum) tubing with ten (10) molded "sensor" (or "contact") units spaced at regular intervals vertically along the 2 meter long probe. Each sensor unit shall be designed to prohibit ingress of moisture, and the sensor material shall be SMO254 stainless steel or AL6XN stainless steel.

b. Provide probe with sufficient length of continuous manufacturer supplied cable to reach the pump control panel.

2. Mounting:

a. The probe shall be mounted in a non-turbulent area of the wet well, suspended on its own cable.

b. The probe shall be connected to a corrosion-resistant support structure as recommended by the manufacturer. The support structure shall consist of a bracket and polyurethane squeegee with a hole of adequate size to allow the probe to be removed with entering the wet well.

3. Sensors (Contacts):

a. Ten (10) sensors shall be spaced along the length of the probe assembly, and each shall be individually connected to a correspondingly labeled 0.03" minimum diameter PVC flexible cable.

b. Each sensor shall protrude from the PVC surface of the probe.

c. All internal components of the probe shall be sealed from the outside.

d. Each sensor unit shall be rotated a minimum of 90 degrees from any of the previous sensor units to eliminate short-circuiting or "tracking" between sensors.

4. Cable:

a. Each cable be clearly labeled for identification and ease of wiring.

b. The flexible cables shall be capable of supporting the weight of the probe and cable without the need for additional support.

c. The cable shall be secured to the top of the probe by a synthetic rubber compression fitting or a cable retainer.

5. Controller:

a. Provide manufacturer-approved controller as requried to interface with the pump control panel Multismart control system.

b. Mount controller in the Pump Control Panel.

c. Provide controller with intrinsically safe barriers between the level probe and controller; barriers shall be as recommended by the manufacturer.

6. Warranty:

a. Probe shall be covered by the manufacturer's ten (10) year warranty.

7. Manufacturers:

a. MultiTrode Probe by MultiTrode, Inc.

b. FOGRod by Wastewater Level, LLC.

c. Or equal.

D. VFDs

1. Provide VFDs for each pump in accordance with Division 16 and the diagram shown on Drawing E-602. Coordinate the wiring of the VFDs and the Pump Control Panel.

2.10 PUMP CONTROL PANEL

A. Provide a pump control panel compatible with the above specified instrumentation for as described herein. The pump control panel provided shall be furnished in compliance with the requirements of Division 16, including, but not limited to, Sections:

1. 16050 – Basic Electrical Requirements

2. 16137 – Control Cabinets and Enclosures.

3. 16490 – Components and Accessories

B. Pump control panel shall be manufactured by a UL certified panel shop and shall bear either the UL508 industrial control equipment label or the UL 698A. Standard for Industrial Control Panels Relating to Hazardous (Classified) Locations as required. Pump Control Panel(s) shall comply with the following:

1. NEMA 12 Enclosure; panel maximum width shall be 36” and maximum depth shall be 12”.

2. Lockable.

3. Control the specified number of pumps for the location.

4. Powered by 120 Volts 60 Hz 1 phase and shall control the pump VFDs; pump VFDs are to be remote from the pump control panel and provided in accordance with Division 16.

5. Power all instrumentation in the Pump Station.

6. Short Circuit Current Rating (SCCR) as specified in 16050 – Basic Electrical Requirements.

7. Provide pump control panel with intrinsically safe circuits for the level transducer and backup Multitrode Level Probe.

8. Provide the pump control panel with adjustable time delay capable of the following:

a. Preventing race conditions on power up of the control panels including intrinsically safe relays.

b. Delays are manually adjustable over a minimum range of 0 to 90 seconds in increments of 2 seconds or less.

c. Delaying the start of each pump as follows:

1) Lead pump cannot restart until at least 10 seconds (adjustable) after power is restored to the control panel (e.g. power transition to or from the generator).

2) When operating on utility power, the Lag pump(s) cannot restart until at least 10 seconds (adjustable) after the last pump has been started. (in backup level or transducer control)

9. All Lamps shall be LED, Push to test (except Control Power On) and use the following color codes for Lamp Lens:

    a. White – Power On, Selected Status.

    b. Amber – Alarms

    c. Green– Pump Running/On

    d. Red– Pump Stopped/Off

10. Pump Control Panel shall include a pump controller to provide start/stop and speed control of the pumps to maintain the wet well level between specified ranges and monitoring of the pumps. The pump controller shall meet the following requirements:

    a. The pump controller shall be a Flygt MultiSmart pump controller (microprocessor based), or Equal.

    b. The pump controller shall be a standard "off the shelf" piece of equipment designed for this purpose and specifically suited for this type of industrial control panel service. Job specific, "one-of-a-kind" customized software and hardware components will not be accepted. A standard system is defined, as one, which has published literature, is available at time of bid, with fully tested hardware and software, such that no development must be done beyond system configuration.

    c. The pump controller shall be a microprocessor-based automatic pump and alarm control system incorporating an industrial-grade controller and associated elements suitable for achieving performance as hereinafter described. All of the discrete I/O circuitry of the computer-based system shall be built to the IEEE 472 (1974) Surge Withstand Capability Standards. All job connections shall be a UL recognized clamp type barriered screw terminals accepting up to two AWG 14 conductors per terminal.

    d. The controller will incorporate the following:

        1) Internal diagnostics.

        2) Real time clock calendar.

        3) Floating-point math.

        4) Battery backup.

        5) Non-proprietary RTU communication.

11. During normal operation, the pump controller operates based on a 4-20mA input (level transducer) scaled to the wet well level and shall be capable of being configured at the factory or jobsite to perform operating functions as described below.

    a. Duplex Pump operation.

    b. Wet well transducer scaling.

    c. Wet well transducer offset.

d. Wet well cross-sectional area for Flow Monitor.

e. Pump Alternation method.

f. Field adjustable activation levels. Activation levels are password protected and provided as follows:

1) High Level Alarm.

2) Lag pump start.

3) Lead pump start.

4) Wet well level setpoint.

5) Lag pump stop.

6) Lead pump stop.

7) Low Level Alarm.

g. Control Panel will pace the pumps based on the transducer level in the wet well as follows:

1) The duty pump will start when level rises above the start level setpoint and then run to maintain a level set point in the wet well (slightly lower than the start level) subject to the pump's minimum speed setpoint (adjustable – but initially 55% speed to deliver 750 gpm which is ~3 feet per second in the 10" force main. This will save energy.)

2) If influent flow to the pump station is greater than the pumping rate at min speed (say 750 gpm), then the pump speed will us a PID loop to ramp up to maintain the desired wet well level until the pump gets to its rated flow (1600 gpm).

3) If influent flow to the pump station is less than the pumping rate at min speed (say 750 gpm), then the pump speed will stay at the minimum speed until the wet well level drops below the stop setpoint and the pump will shut off.

4) Note: During prolonged dry weather it is anticipated that much of time will be spend with the two pumps alternating and cycling on and off – unless the min speed is significantly reduced.

h. The control panel shall control the operation of the Aerator/mixer that is used to prevent build-up of scum in the wet well. The operation of the aerator/mixer shall be so that it does not run at all times and it only runs for an adjustable period of time (based on wet well levels) in between pump cycles. Provide a 120V powered discrete output to activate a remote starting relay for the Aerator/Mixer.

i. The control panel shall be programmable to limit the number of pumps running at the same time to two when on utility power and one when on generator power to prevent overloading the electrical system.

1) While on utility power, the operators should have the option to run both, but this should not be normal operating procedure and the

control panel shall be programmable to delay the starting of the lag pump.

2) Only one pump shall operate while on generator power.

3) These interlock shall operate when running on backup level sensor (multitrode) or on the level transducer and will require confirmation from the VFD(s) that the VFD from the lead pump is running/not faulted before locking out the lag pump, and must confirm that the VFD from lag pump is running/not faulted before locking out the lead pump.

4) When the system is running on generator power, and if the current pump has been operating for more than 300 seconds (adjustable), and a "High Level Alarm" is active, then alternate the pump.

j. A flow-monitoring algorithm to measure influent flow. This algorithm shall calculate the incoming flow rate during periods of pump inactivity, detecting the change in level and using the configured wet well area. Pumping rates are calculated during periods of pump activity, detecting the change in level and using the configured wet well area and average incoming flow rate. The controller shall display incoming flow, totalized flow in gallons per minute and each pump's flow rate in gallons per minute.

12. The equipment shall be protected from transient voltages and surges induced into the signal lines. Contractor shall provide a permanent earth ground connection to the panel ground lug to ensure proper operation of transient protectors.

13. Control panel wiring shall include identification numbers. Identification numbers shall be shown on the manufacturer's control panel drawings.

14. The system shall incorporate UL 508 Industrial Control Panel approved elements as required of all components of these project panels and be furnished with all necessary hardware and software to accomplish level-responsive pump and alarm operation with software specifically suited to this project.

C. Provide a pressure transducer for the wet well to measure levels and allow the pump controller to perform the pump control functions (start/stop of pumps, level control, and alarms).

1. Provide the pressure transducer with an aneroid bellows for atmospheric pressure compensation and sufficient cable length to locate bellows in junction box or pump control panel as shown on the drawings.

2. The pressure transducer shall be the primary wet well level signal used for control of the pumps. A means, readily adjustable by the Owner, shall be provided for setting the setpoints (activation levels) when operating on the pressure transducer.

D. Provide the Pump Control Panel with a backup Multitrode Level Probe. The backup Multitrode Level Probe shall be independent of the pressure transducer.

1. Provide a switch to manually select the backup level probe or the transducer level sensor for use by the pump controller.

a. Manual selection of the sensor to use for level control shall be used for setup, testing, and maintenance purposes only.

b. Should the Multitrode level probe be activated as discussed below, the pump controller shall automatically switch from using the transducer for level control to using the Multitrode for level control.

c. After being automatically switched to using the Multitrode for backup level sensing , the control system shall continue using the Multrtroe for level control until the "reset" button is pushed.

2. The backup level control functionality shall be as follows:

a. The lead pump shall be selected with the option for the operator to select that it be automatically alternated each time the lead pump is called on to start.

3. The backup level control activation levels shall be as follows:

a. Provide the following control/activation levels. Note that all ten of the available Multitrode levels may or may not be used by adding more intermediate speeds.

1) High Level – Start lag pump, transmit high level alarm, and switch to backup level control.

2) Pump On (Full Speed) Level – Increase lead pump to full speed.

3) Pump (Medium High Speed) Level – Increase lead pump speed

4) Pump (Medium Speed) Level – Increase lead pump speed.

5) Pump (Medium Low Speed) Level – Increase lead pump speed.

6) Pump On (Low Speed) Level – Start lead pump at programmed low speed.

7) Pump Off Level – Shut off all pumps.

8) Low Alarm Level – Shut off pumps, transmit low level alarm, and switch to backup level control.

b. Note: when operating on generator, the lead pump should start first and lag pump will not start unless the lead pump VFD does not confirm it is "running" / "not faulted".

E. Pump Control Panel shall include the following:

1. Surge Protection on Main Incoming Power

2. Control Panel "Power On" Lamp

3. Liquid Level Display(s)

4. Wet well level sensor Selector Switch: Transducer/Backup Level Sensor

5. High Wet Well Level Alarm Lamp

6. Low Wet Well Level Alarm Lamp

7. Lead Pump Selection Switch (Pump 1/Pump 2/Alt)

8. Means to set the activation levels when on transducer control

9. Backup Level Sensor

    a. Push button to reset to transducer control

    b. Status Lamps (or other clear indication) to indicate "using transducer sensor" and "using multitrode sensor"

10. External audible alarm, alarm test and silence buttons

11. For each installed pump provide the following:

    a. Elapsed Time Meter

    b. Pump "Fault" Alarm Lamp

    c. Pump "On" Lamp

    d. Pump "Off" Lamp

    e. Hand-Off-Auto Selector Switch*

    f. Pump "Seal Leak" Alarm Lamp*

    g. Pump "Thermal Overload" Alarm Lamp*

    h. Pump Control and Status monitoring system*

        * = Not Required if equivalent is provided on the VFD which is the intent of the design – See electrical design , especially E-602.

12. Spare Parts - See list above.

13. Provide the Pump Control Panel with the capability to communicate with the Water Pollution Control Plant's existing SCADA system over a fiberoptic based ethernet network (provided by others). To connect with that network, provide the Pump Control Panel with a TrendNet 6-port fiber-to-Ethernet converter switch that has been provided with LC type connectors to fit inside the switch's SFP module (this is required to match other switches in the network).

14. Provide the Pump Control Panel with the ability to have its setpoints remotely adjusted and the status of the pump station monitored by the Water Pollution Control Plant's existing SCADA system. Programming of the SCADA system to communicate with the Pump Control Panel is by others. Provide support to the SCADA systems integrator as needed.

15. Provide the Pump Control Panel with the ability to allow the Water Pollution Control Plant's existing SCADA system to monitor the following signals/status at the pump station (some of which will be hardwired to the Pump Control panel and others created from available inputs):

    a. Digital Status:

        1) Transducer Fault

        2) Multitrode Fault

        3) Operating on Transducer

        4) Operating on Multitrode

5) Low Wet Well Alarm (from transducer or Multitrode Level Probe)
6) High Wet Well Alarm (from transducer or Multitrode Level Probe)
7) Pump 1 Running
8) Pump 2 Running
9) Pump 1 Seal Leak
10) Pump 2 Seal Leak
11) Pump 1 Thermal Overload
12) Pump 2 Thermal Overload
13) Pump 1 VFD Not-in-Auto
14) Pump 2 VFD Not-in-Auto
15) Pump 1 VFD Fault
16) Pump 2 VFD Fault
17) Loss of Utility Power (from ATS)
18) Running on Generator (from ATS)
19) Electrical Phase Failure (from ATS)
20) Generator Running
21) Generator Fault
22) Control Panel UPS Fault
23) Aerator/Mixer Running
24) Wet well levels (Based on Multitrode – 10 levels)
25) Spare

b. Analog 4-20 ma signals:
1) Flow Meter
2) Wet Well Level (Transducer)
3) Pump 1 Speed (Hz)
4) Pump 2 Speed (Hz)

16. The Pump Control Panel shall be capable of controlling the following equipment. Control shall be automatically by the controller or if desired, remotely overridden from the Water Pollution Control Plant's SCADA system.
a. Pump 1 Start /Stop
b. Pump 2 Start /Stop
c. Pump 1 Speed
d. Pump 2 Speed

e. Mixer/Aerator Start/Stop

PART 3 EXECUTION

3.1 GENERAL

A. Provide required field measurements to facilitate design of Pump Support Bases.

B. Make all adjustments necessary to place the equipment in satisfactory working order at the time of the field testing.

C. Coordinate with the requirements of Section 03485 to provide a fully functioning submersible pumping facility. This shall include Pump Manufacturer providing pump base to be assembled and installed in the Precast Pump Station at the Precast Structure Manufacturer's Factory prior to shipment.

3.2 INSTALLATION

A. Install pumps, pipes, valves and appurtenances in accordance with the recommendations and instructions of the manufacturer and in accordance with the Drawings and Specifications or as approved by the Engineer. Provide supervision of installation and testing of equipment by the manufacturer's representative in accordance with the requirements of this Section.

B. It shall be the responsibility of the Contractor to coordinate the Work included under this Section with other related Work to ensure that all the equipment shall operate to perform the designated functions in a proper and acceptable manner.

C. Pipe and fittings shall be installed in accordance with the Drawings and Specifications regarding excavation and backfilling, alignment and grade, trench preparation, pipe laying, blocking, anchoring, testing, protection and cleaning.

D. Connect suction and discharge piping without imposing strain to pump flanges.

E. Anchor bolts shall be accurately placed using equipment templates.

F. Pump control panel indicators shall be mounted at operator-level height, maximum of 5-ft above the finished floor where operators will stand to access the control panel.

3.3 TESTING

A. General

1. Provide a certificate from the equipment manufacturer stating that the installation of his equipment is satisfactory, that the equipment is ready for operation, and that the operating personnel have been suitably instructed in the operation, lubrication and care of each unit shall be submitted. The report shall also confirm that nothing in the installation will render the manufacturer's warranty null and void.

B. Factory Testing

1. Submit certified factory test data showing the results of factory testing for each of the pumps including performance curves for each pump from shutoff to maximum capacity, showing total dynamic head, hydraulic and overall efficiency, brake horsepower, voltage and amperage.

2. Hydrostatic and performance testing shall be in accordance with the current ANSI/HI Standard 11.6 and demonstrate that the pump meets the HI Grade

performance specified for the pump and also shall demonstrate fitness for the service specified and the ability of the pumping units to operate without vibration or overheating when operated to meet the performance requirements specified.

3. A minimum of five head/capacity points shall be taken for the test while running the pump at full speed. Points shall be taken as near as possible to each specified full speed condition. At least one point of the five shall be taken as near as possible to the specified guaranteed design point.

4. Acceptance of the pump test results will be judged at rated capacity and rpm with applicable total head and efficiency per current ANSI/HI 11.6 – Rotodynamic Submersible Pumps standard tolerances for the pumps specified grade.

5. Pumps shall be hydrostatically tested at 1.5 times the shut-off head internal pressure.

6. Motor and cable insulation shall be tested for moisture content and defects before and after the hydrostatic tests.

7. Submit a certified written report prepared by the manufacturer with the details and results of the tests.

C. Field Testing

1. Field test shall not be conducted until such time that the pump installation is complete and ready for testing.

2. After the complete pumping units and appurtenant equipment have been installed, and the units have been inspected, tested, adjusted and placed in proper operating condition under the direct observation of the pump manufacturer's representative, the pumping equipment shall be field-tested by the Contractor in the presence of the Engineer.

   a. The tests shall demonstrate fitness for the service specified and the ability of the pumping units to operate without vibration or overheating when operated to meet the performance requirements specified.

   b. Pumps shall be field tested at a minimum of four head/capacity points to demonstrate pumps are tracking along the certified pump curve (by throttling the discharge isolation or other valves and measuring discharge and suction pressures/levels) and that the pump can achieve all of the specified design points. For pumps operating from variable speed drives, collect a minimum of two head/capacity points at various speeds without throttling any valves.

   c. Record driving motor voltage and amperage measured for each phase for each test point. Record power readings at each test point as well.

   d. The results of field tests, including plots of the field test points on the certified pump performance curves (from the factory test) shall be submitted to the Engineer for approval.

3. Operate each pump under normal operating conditions for a minimum pump run time of 24 cumulative hours without malfunction, prior to being considered accepted. In addition, unless otherwise specified in Section 01140, do not

proceed with work on the next pump at that location until the last pump worked on has been accepted. If all pumps have been taken out of service, do not demobilize bypass pumping equipment until all pumps have been accepted.

4. Wastewater shall be used for testing by the Contractor and the overnight supervision shall be provided.

5. Adjust, realign, or modify units and retest**,** if necessary.

6. Correct or replace promptly all defects or defective equipment revealed by or noted during testing, and if necessary, repeat the tests until satisfactory results are obtained. Furnish all labor, piping, equipment and materials necessary for testing.

7. In the event the equipment fails to meet any of the requirements specified above, make the necessary changes and retest the equipment. If the equipment remains unable to meet the specified requirements to the satisfaction of the Owner, remove and replace the equipment with satisfactory equipment at no cost to the Owner.

D. Manufacturer's Field Services

1. Coordinate the services of a qualified field service engineer provided by the manufacturer for start-up, inspection, and testing.

2. Provide the services of a manufacturer's factory-trained technician to train the Owner on the operation, calibration and maintenance of equipment supplied under this Section. Provide the Owner with a minimum 7 days' written notice of planned operator training.

3. Provide a minimum of 8 hours of field service at each pump station/location by an authorized, factory trained representative of the pump manufacturer for installation and start-up supervision for the pumps and pump controls. Services shall include, but not necessarily be limited to, inspection of the completed installation to ensure that it has been performed in accordance with the manufacturer's instructions and recommendations, and supervision of all field testing, and training in the operation and maintenance of all equipment provided under this Section, as well as activation of the Warranty.

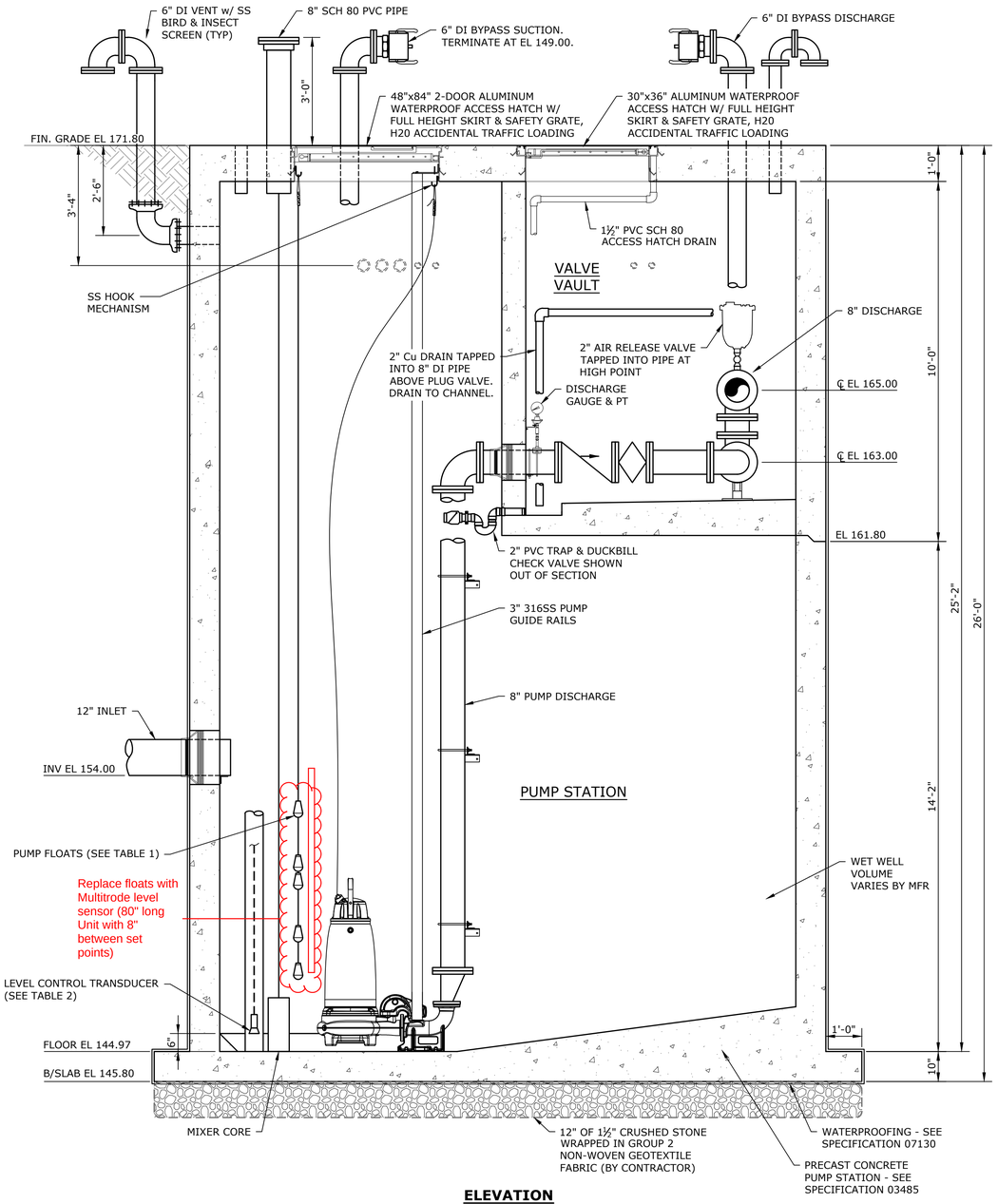
SCHEDULE 11312-1 - Performance Data for Shuttle Meadow Pump Station		
Pump Reference/Tag Number		Shuttle Meadow **Pump - (P-101, P-102)**
Pump Type		Wet Pit Submersible Non-Clog Centrifugal Solid Handling for Raw Wastewater Service Continuous/Intermittent Operation
Number of Pumps to be Provided		3 (1 Duty, 1 Standby, 1 Shelf Spare)
Minimum Pump Suction/Discharge Diameter		8 inches / 6 inches
Minimum Spherical Solid Size		3 inches
Maximum Rated Speed (Nominal)		1800 rpm
Maximum Motor Size, Maximum Full Load Amps		67 hp, 76 Amps
Other Motor Requirements		Premium Efficiency Listed by Factory Mutual or UL as explosion-proof (see below)
Power Requirements		460V / 3 Ph / 60 Hz
Maximum Assembled Pump Weight (including Motor & Cables)		1260 lbs
Minimum Pump Shutoff Head		177 feet
Approximate Static Head Range		28.7 feet to 34.2 feet (Suction and Discharge Liquid Level Dependent)
Full Speed	**Pump's Guaranteed Design Point**	1600 gpm @ 93 ft TDH (@ ~33 feet $NPSH_A$)
	Maximum $NPSH_R$	22 feet
	Minimum Efficiency	73 % Hydraulic 69.5 % Water to Wire
	ANSI/HI Grade	HI Standard for Municipal Wastewater 2U with water to wire efficiency guaranteed
Minimum Anticipated Flow (Single Duty Pump at Low Speed)	**Pump's Design Point**	730 gpm @ 49 ft TDH (@~34 feet $NPSH_A$)
	Maximum $NPSH_R$	16 feet
	Minimum Hydraulic Efficiency	61%
	Minimum Wire-to-Water Efficiency	59%

Notes

1. Motor shall be non-overloading over entire pump curve.
2. When operating in conjunction with adjustable speed drives, each pump shall be capable of delivering all flows between the specified "Minimum Anticipated Flow" and the "Full Speed All Duty Pumps in Service" Design Points while operating within the pumps Preferred Operating Range (POR) or Acceptable Operating Range as defined by ANSI/HI. At least 95% of the range must be covered by the POR.}
3. Pump shall be capable of at least 50% turndown (to 30 Hz) without clogging, when used in conjunction with adjustable frequency drives.
4. The $NPSH_A$ value(s) specified above are based on a Max Liquid Temperature of 75°F and a pump inlet diameter of 8 inches and the anticipated wet well elevations which will vary from a static water level of approximately 3.03 to 7.53 feet above the concrete floor under the submersible pump.
5. Pumps shall fit within the space provided in the configuration as shown on the drawings with sufficient vertical and lateral space for proper function. Pump shall have maximum dimensions such that they can be removed through a hatch with dimensions not exceeding 48" length x 84" width hatch opening, without disassembly. Pump shall be removed from the wet well shown on the drawing, using the manufacturer supplied slide rail, chain and grab link system in conjunction with a portable crane.

END OF SECTION

\\tighebond.com\data\Projects\P\P0659 Plainville, CT\023_Shuttle Meadow WW PS\Design\Specs\11312-1.docx



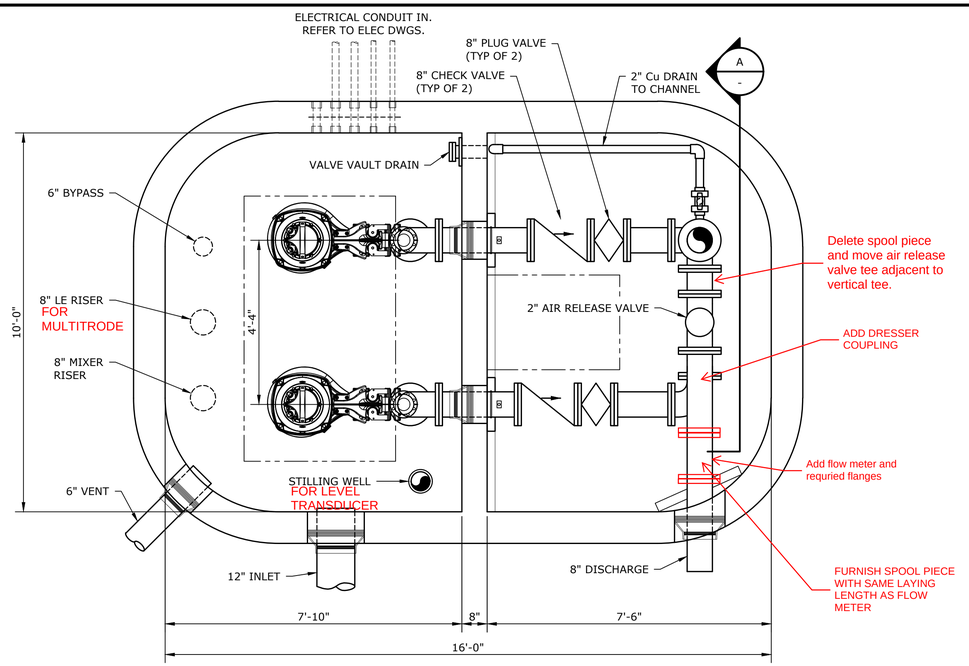
ELEVATION
1/2"=1'-0"

TABLE 1 - FLOAT ELEVATIONS	
DESCRIPTION	ELEVATION
HIGH HIGH LEVEL	152.5
HIGH LEVEL	151.0
PUMP ON	150.5
PUMP OFF	148.5
LOW LEVEL	148.0

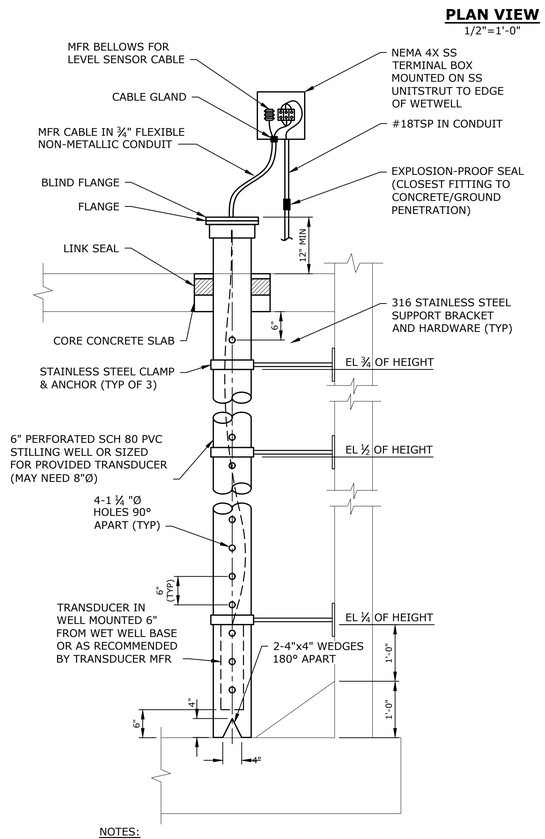
TABLE 2 - TRANSDUCER SET POINTS	
DESCRIPTION	ELEVATION
HIGH HIGH LEVEL ALARM	~~152.0~~ 153.0
~~HIGH LEVEL~~	~~151.5~~
PUMP ON	151.5
PUMP OFF	149.5
LOW LEVEL	148.5

Level Control Setpoint = 151.0

Initial Setpoints (To be adjusted during Startup)



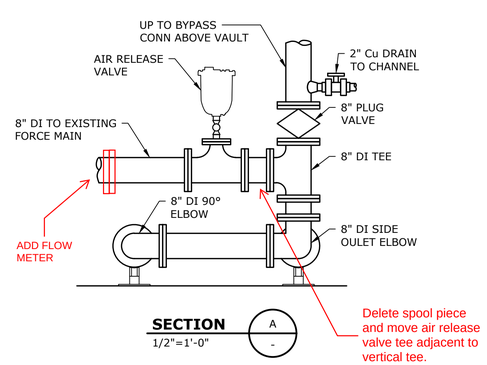
PLAN VIEW
1/2"=1'-0"



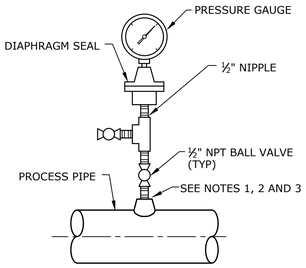
NOTES:

1. COORDINATE LOCATION OF STILLING WELL AND FLANGED COVER ABOVE RIM WITH PUMP STATION MANUFACTURER.

STILLING WELL DETAIL
NO SCALE



SECTION A
1/2"=1'-0"



NOTES:

1. FOR STEEL, GALVANIZED STEEL, AND PVC 2" AND SMALLER, USE A BUSHING IN A TEE.
2. FOR DUCTILE IRON AND FIBERGLASS REINFORCED PLASTIC PIPE, ALL SIZES, USE A PIPE SADDLE AND BUSHING.
3. FOR STEEL AND STAINLESS STEEL PIPES 3" AND LARGER, USE THRED-O-LET AS SHOWN.

PRESSURE GAUGE AND DIAPHRAGM
NO SCALE

Tighe&Bond

STATE OF CONNECTICUT · STEPHEN SEIGAL · PEN.0012704 · LICENSED PROFESSIONAL ENGINEER
10/18/2023

STATE OF CONNECTICUT · FREDERICK A. MUELLER · 18382 · LICENSED PROFESSIONAL ENGINEER
10/18/2023

Digitally signed by Fred Mueller
Date: 2023.10.18 13:01:06-04'00'

Town of Plainville

Shuttle Meadow Pump Station Rehabilitation

Plainville, Connecticut

MARK	DATE	DESCRIPTION
0	10/2023	ISSUED FOR CONSTRUCTION

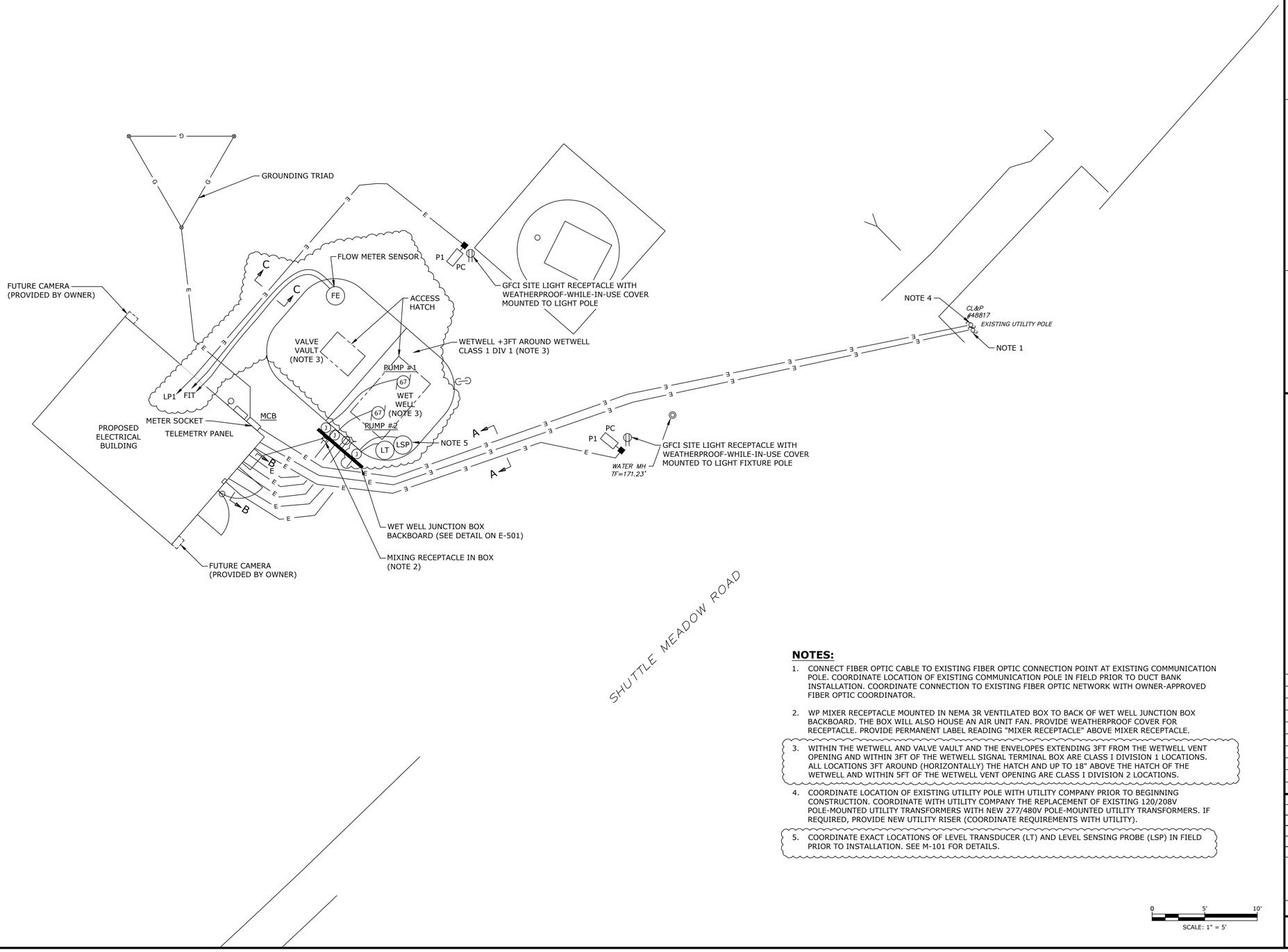
PROJECT NO:	P0659-023
DATE:	OCTOBER 2023
FILE:	P0659-023-M-101.dwg
DRAWN BY:	AJS
DESIGNED/CHECKED BY:	ALS
APPROVED BY:	SES

PUMP STATION PLAN & SECTION

SCALE: AS SHOWN

M-101
SHEET 16 OF 25

Last Saved: 10/17/2023
Plotted: Oct 17, 2023 - 2:29pm By: ASapelli
Tighe & Bond:J:\P\P0659 Plainville, CT\023_Shuttle Meadow WW PS\Drawings\AutoCAD\Sheets\P0659-023-M-101.dwg



NOTES:

1. CONNECT FIBER OPTIC CABLE TO EXISTING FIBER OPTIC CONNECTION POINT AT EXISTING COMMUNICATION POLE. COORDINATE LOCATION OF EXISTING COMMUNICATION POLE IN FIELD PRIOR TO DUCT BANK INSTALLATION. COORDINATE CONNECTION TO EXISTING FIBER OPTIC NETWORK WITH OWNER-APPROVED FIBER OPTIC COORDINATOR.
2. WP MIXER RECEPTACLE MOUNTED IN NEMA 3R VENTILATED BOX TO BACK OF WET WELL JUNCTION BOX BACKBOARD. THE BOX WILL ALSO HOUSE AN AIR UNIT FAN. PROVIDE WEATHERPROOF COVER FOR RECEPTACLE. PROVIDE PERMANENT LABEL READING "MIXER RECEPTACLE" ABOVE MIXER RECEPTACLE.
3. WITHIN THE WETWELL AND VALVE VAULT AND THE ENVELOPES EXTENDING 3FT FROM THE WETWELL VENT OPENING AND WITHIN 3FT OF THE WETWELL SIGNAL TERMINAL BOX ARE CLASS I DIVISION 1 LOCATIONS. ALL LOCATIONS 3FT AROUND (HORIZONTALLY) THE HATCH AND UP TO 18" ABOVE THE HATCH OF THE WETWELL AND WITHIN 5FT OF THE WETWELL VENT OPENING ARE CLASS I DIVISION 2 LOCATIONS.
4. COORDINATE LOCATION OF EXISTING UTILITY POLE WITH UTILITY COMPANY PRIOR TO BEGINNING CONSTRUCTION. COORDINATE WITH UTILITY COMPANY THE REPLACEMENT OF EXISTING 120/208V POLE-MOUNTED UTILITY TRANSFORMERS WITH NEW 277/480V POLE-MOUNTED UTILITY TRANSFORMERS. IF REQUIRED, PROVIDE NEW UTILITY RISER (COORDINATE REQUIREMENTS WITH UTILITY).
5. COORDINATE EXACT LOCATIONS OF LEVEL TRANSDUCER (LT) AND LEVEL SENSING PROBE (LSP) IN FIELD PRIOR TO INSTALLATION. SEE M-101 FOR DETAILS.

0 5' 10'
SCALE: 1" = 5'

Tighe&Bond

Town of Plainville

Shuttle Meadow Pump Station Rehabilitation

Plainville, Connecticut

MARK	DATE	DESCRIPTION
0	10/2023	ISSUED FOR CONSTRUCTION

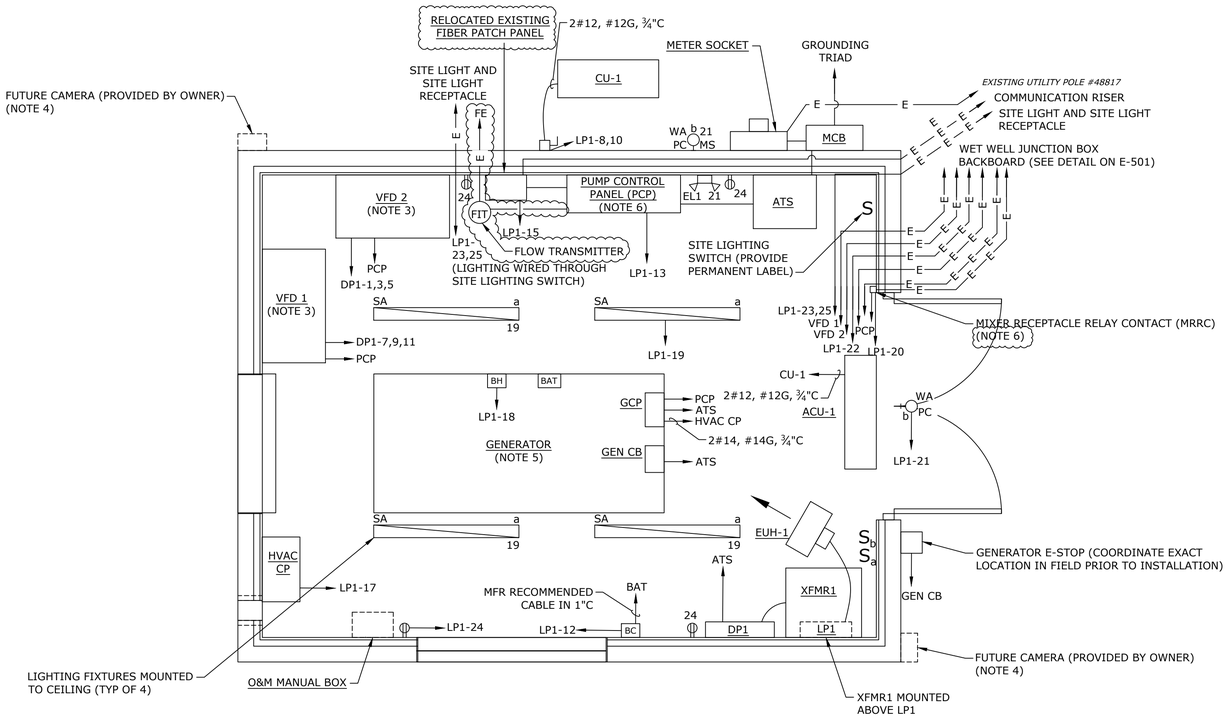
PROJECT NO:	P0659-023
DATE:	OCTOBER 2023
FILE:	P0659-023-E-100.dwg
DRAWN BY:	OLR
DESIGNED/CHECKED BY:	CST
APPROVED BY:	SES

ELECTRICAL SITE PLAN

SCALE: AS SHOWN

E-100
SHEET 21 OF 25

Last Saved: 11/28/2023
Plotted: Dec 06, 2023 - 3:01pm By: SGiri
Tighe & Bond J:\P\P0659 Plainville, CT\023_Shuttle Meadow WW PS\Drawings\AutoCAD\Sheets\P0659-023-E-100.dwg



ELECTRICAL FLOOR PLAN

NOTES:

1. COORDINATE LOCATIONS OF LIGHTING FIXTURES AND SENSORS/SWITCHES WITH PROPOSED DUCTWORK, REGISTERS, AND OTHER EQUIPMENT IN FIELD PRIOR TO INSTALLATION (TYP OF ALL LIGHTING FIXTURES AND SENSORS/SWITCHES).
2. COORDINATE LOCATION OF EQUIPMENT TO ALLOW CODE-REQUIRED WORKING SPACE CLEARANCES IN FIELD PRIOR TO INSTALLATION.
3. VFD ENCLOSURE SHALL HAVE A MAXIMUM WIDTH OF 36" AND A MAXIMUM DEPTH OF 20". COORDINATE VFD ENCLOSURE SIZE PRIOR TO PURCHASE.
4. PROVIDE THE FOLLOWING:

   - 1-1"C BETWEEN EACH CAMERA LOCATION AND TO THE CEILING ABOVE THE TELEMETRY PANEL FOR CAMERA CONTROL WIRING (PROVIDED BY OWNER). CAP CONDUIT AT FUTURE CAMERA LOCATION.

   - 1-1"C BETWEEN EACH CAMERA LOCATION AND LP1 FOR CAMERA SIGNAL CABLE (PROVIDED BY OWNER). CAP CONDUIT AT FUTURE CAMERA LOCATION.
5. THE GENERATOR PACKAGE MAY BE DELIVERED BOLTED TO RIGGING LIFTING BEAMS. IF THE GENERATOR PACKAGE IS DELIVERED WITH RIGGING LIFTING BEAMS THAT EXTEND OUT PAST THE EDGE OF THE GENERATOR, THE RIGGING LIFTING BEAMS SHALL BE CUT TO EXTEND NO MORE THAN 3" PAST THE EDGE OF THE MAIN GENERATOR BODY.
6. PROVIDE RELAY FOR MIXER RECEPTACLE SUCH THAT WHEN THE MIXER IS PLUGGED IN AND RUNNING, A SIGNAL IS SENT TO THE PUMP CONTROL PANEL INDICATING "MIXER ON". PROVIDE CURRENT SWITCH, WIRING, AND RELAYS AS REQUIRED. PUMP CONTROL PANEL SHALL CONTROL POWER TO THE MIXER RECEPTACLE; PROVIDE A RELAY IN THE MRRC AND WIRE IT TO PROVIDE POWER TO THE MIXER RECEPTACLE ONLY WHEN A 'MIXER RUN' SIGNAL (120VAC POWERED OUTPUT) IS SENT FROM THE PUMP CONTROL PANEL.

0 1' 2' 4'
SCALE: 1/2"=1'-0"

Tighe&Bond

Town of Plainville

Shuttle Meadow Pump Station Rehabilitation

Plainville, Connecticut

MARK	DATE	DESCRIPTION
0	10/2023	ISSUED FOR CONSTRUCTION

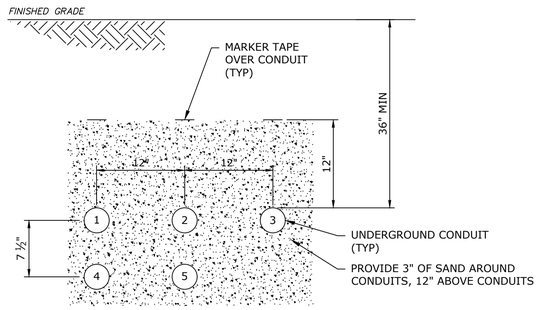
PROJECT NO:	P0659-023
DATE:	OCTOBER 2023
FILE:	P0659-023-E-101.dwg
DRAWN BY:	OLR
DESIGNED/CHECKED BY:	CST
APPROVED BY:	SES

ELECTRICAL BUILDING ELECTRICAL POWER & LIGHTING FLOOR PLAN

SCALE: AS SHOWN

E-101
SHEET 22 OF 25

Last Saved: 11/27/2023
Plotted: Nov 28, 2023 - 12:19pm By: SGiri
Tighe & Bond J:\P\P0659 Plainville, CT\023_Shuttle Meadow WW PS\Drawings\AutoCAD\Sheets\P0659-023-E-101.dwg



1. 2"C FOR POWER TO SITE LIGHTING AND SITE LIGHTING RECEPTACLE
2. 2"C FOR FIBER OPTIC CABLE TO EXISTING UTILITY POLE FROM TELEMETRY PANEL
3. 4"C FOR UTILITY SERVICE CONDUCTORS (NOTE 1, 2)
4. 2"C SPARE WITH PULL CORD (STUB UP/CAP INSIDE BUILDING AND AT UTILITY POLE
5. 4"C SPARE WITH PULL CORD (NOTE 2)

NOTES:

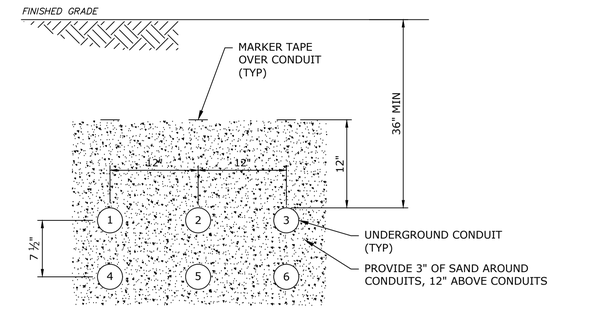
1. COORDINATE INSTALLATION OF NEW BELOW GRADE CONDUIT FOR NEW ELECTRICAL UTILITY SERVICE WITH ELECTRICAL UTILITY COMPANY PRIOR TO BEGINNING CONSTRUCTION.
2. COORDINATE CONDUIT SIZE WITH UTILITY COMPANY PRIOR TO PURCHASE. STUB UP SPARE CONDUIT AT UTILITY POLE AND CONNECT TO MAIN BREAKER. SEE 16210 FOR ADDITIONAL REQUIREMENTS.

BELOW GRADE DUCT BANK CONDUIT A-A

NO SCALE

WET WELL JUNCTION BOX BACKBOARD DETAIL

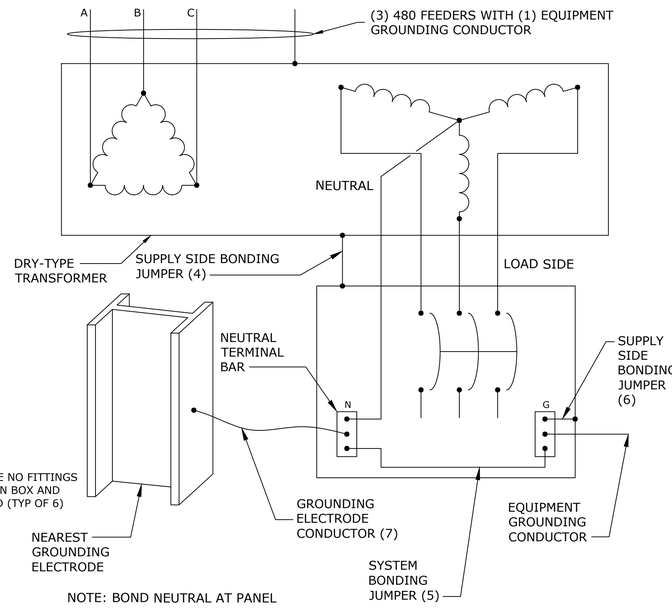
NO SCALE



1. 1½"C FOR POWER/SIGNAL TO PUMP #1
2. 1"C FOR POWER TO WETWELL RECEPTACLE
3. 1"C FOR LEVEL TRANSDUCER CONTROL WIRING
4. 1½" FOR POWER/SIGNAL TO PUMP #2
5. 1"C FOR POWER TO MIXING RECEPTACLE BOX
6. 1"C FOR FLOAT SWITCH CONTROL WIRING

BELOW GRADE DUCT BANK CONDUIT B-B

NO SCALE

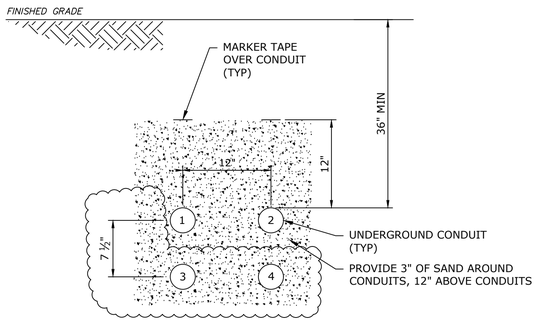


NOTE: BOND NEUTRAL AT PANEL

NOTES:

1. SUPPLY SIDE BONDING JUMPER, SYSTEM BONDING JUMPER, AND GROUNDING ELECTRODE CONDUCTOR SHALL BE SIZED PER NEC TABLE 250.102. REFER TO DETAIL.
2. ALL CONDUCTORS SHALL BE COPPER, SIZED PER NEC TABLE 310.15(B)16.
3. PROVIDE SECONDARY OVERCURRENT PROTECTION. SECONDARY OVERCURRENT PROTECTION SHALL BE LOCATED WITHIN TEN (10) FEET OF THE TRANSFORMER SECONDARY TERMINALS EITHER IN A PANELBOARD (MAIN BREAKER), AN INDIVIDUALLY MOUNTED ENCLOSED CIRCUIT BREAKER, OR FUSED DISCONNECT.
4. SUPPLY SIDE BONDING JUMPER INSTALLED IN FEEDER RACEWAY.
5. SYSTEM BONDING JUMPER INSTALLED INTERNAL TO PANELBOARD.
6. SUPPLY SIDE BONDING JUMPER INSTALLED INTERNAL TO PANELBOARD ENCLOSURE.
7. GROUNDING ELECTRODE CONDUCTOR SHALL BE INSTALLED IN CONDUIT.

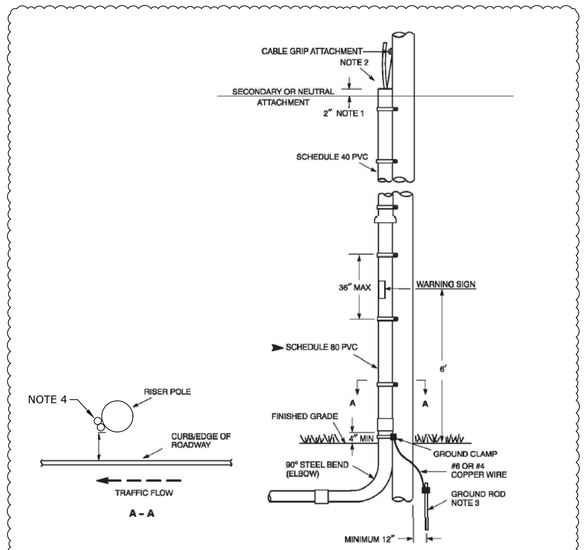
SEPERATELY DERIVED SYSTEM GROUNDING FOR DELTA - WYE TRANSFORMERS



1. 2"C FOR POWER TO SITE LIGHTING AND SITE LIGHTING RECEPTACLE
2. 2"C SPARE WITH PULL CORD
3. FLOW METER POWER WIRING IN 1"C
4. FLOW METER SIGNAL WIRING IN 1"C

BELOW GRADE DUCT BANK CONDUIT C-C

NO SCALE



NOTES:

1. TOP OF CONDUIT TO EXTEND AT LEAST 2 INCHES ABOVE THE NEUTRAL/SECONDARY ATTACHMENT.
2. SEAL CONDUIT FROM WATER ENTRY AT TOP OF RISER FOR SERVICES INSTALLED IN CONDUIT FOR THE ENTIRE RUN.
3. STEEL CONDUIT SHALL BE GROUNDED. IF THE STEEL ELBOW IS INSTALLED IN A NONMETALLIC CONDUIT INSTALLATION, IT SHALL ALSO BE GROUNDED. USE ⅝"x8' GALVANIZED STEEL GROUND ROD AND GROUND CLAMP.
4. PREFERRED LOCATION FOR RISER PLACEMENT IS ON FIELD SIDE OF POLE OPPOSITE THE DIRECTION OF TRAFFIC. CHECK RISER PATH FOR OBSTRUCTIONS, AND COORDINATE WITH OTHER UTILITIES FOR PLACEMENT OF RISERS AND ANY EQUIPMENT. (ROAD SIDE OF POLE OPPOSITE THE DIRECTION OF TRAFFIC IS RESERVED FOR ROAD CROSSINGS.)
5. CONTACT THE TOLL-FREE TELEPHONE NUMBER TO LOCATE BURIED CABLES BEFORE DRIVING GROUND RODS.
6. COORDINATE LOCATION OF RISER POLE WITH OWNER AND UTILITY COMPANY PRIOR TO INSTALLATION.
7. INSTALL SPARE RISER THROUGH THE SWEEP AND TERMINATE AT BASE OF POLE WITH A COUPLING AND CONDUIT PLUG. GROUND THE SPARE SWEEP.
8. APPROVED MATERIALS LIST SHALL BE PROVIDED BY EVERSOURCE.
9. CONFIRM ALL REQUIREMENTS WITH UTILITY PRIOR TO ORDERING MATERIALS.

TRANSFORMER CONNECTION/GROUNDING DETAIL

NO SCALE

Tighe&Bond

Town of Plainville

Shuttle Meadow Pump Station Rehabilitation

Plainville, Connecticut

MARK	DATE	DESCRIPTION
0	10/2023	ISSUED FOR CONSTRUCTION

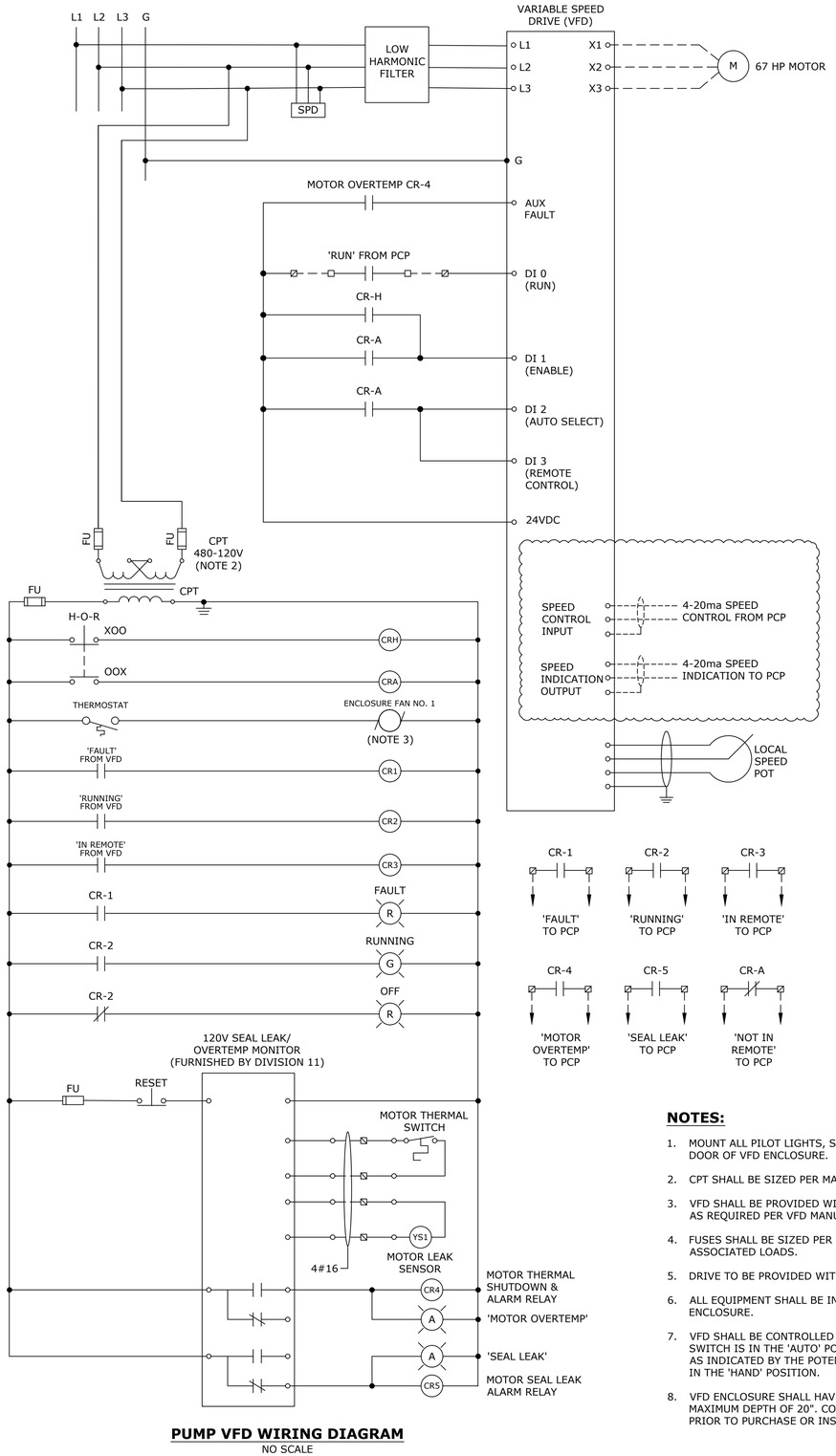
PROJECT NO:	P0659-023
DATE:	OCTOBER 2023
FILE:	P0659-023-E-501.dwg
DRAWN BY:	OLR
DESIGNED/CHECKED BY:	CST
APPROVED BY:	SES

ELECTRICAL DETAILS - 1

SCALE: NO SCALE

E-501
SHEET 23 OF 25

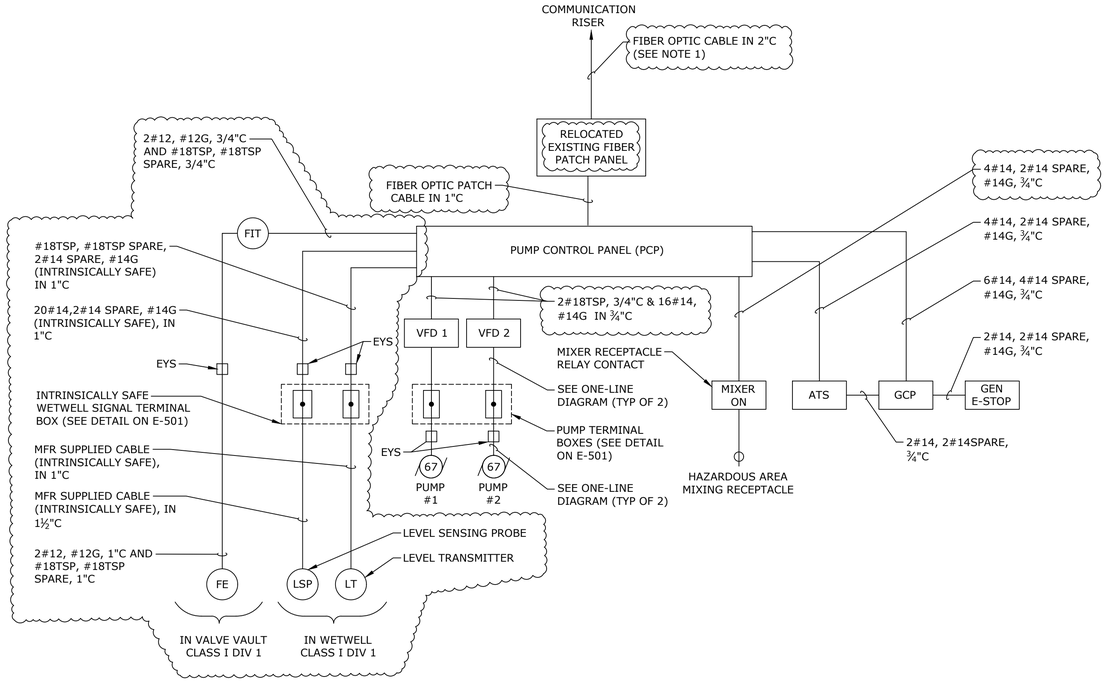
Last Saved: 11/27/2023
Printed: 11/28/2023 - 12:28pm By: SGiri
Tighe & Bond:J:\P\P0659 Plainville, CT\023_Shuttle Meadow WW PS\Drawings\AutoCAD\Sheets\P0659-023-E-501.dwg



PUMP VFD WIRING DIAGRAM
NO SCALE
TYPICAL FOR PUMP 1 & PUMP 2

NOTES:

1. MOUNT ALL PILOT LIGHTS, SWITCHES AND VFD KEYPAD ON DOOR OF VFD ENCLOSURE.
2. CPT SHALL BE SIZED PER MANUFACTURER'S RECOMMENDATIONS.
3. VFD SHALL BE PROVIDED WITH PROPER VENTILATION/COOLING AS REQUIRED PER VFD MANUFACTURER.
4. FUSES SHALL BE SIZED PER NEC IN ACCORDANCE WITH ASSOCIATED LOADS.
5. DRIVE TO BE PROVIDED WITH SURGE SUPPRESSION (SEE 16265).
6. ALL EQUIPMENT SHALL BE INSTALLED IN NEMA 12 STEEL ENCLOSURE.
7. VFD SHALL BE CONTROLLED BY THE PCP WHEN THE 3-POSITION SWITCH IS IN THE 'AUTO' POSITION AND SHALL RUN (AT SPEED AS INDICATED BY THE POTENTIOMETER) WHEN THE SWITCH IS IN THE 'HAND' POSITION.
8. VFD ENCLOSURE SHALL HAVE A MAXIMUM WIDTH OF 36" AND A MAXIMUM DEPTH OF 20". COORDINATE VFD ENCLOSURE SIZE PRIOR TO PURCHASE OR INSTALLATION.



CONTROL & COMMUNICATION SIGNAL DIAGRAM
NO SCALE

NOTES:

1. FIBER OPTIC CABLE SHALL BE 6-PAIR, ALUMINUM INTERLOCKING ARMORED (ILA), RISER-RATED CABLE. CABLE MATERIALS SHALL BE INDOOR/OUTDOOR, UV, WATER, CHEMICAL AND FUNGUS RESISTANT, SUITABLE FOR INSTALLATION IN CONDUIT BELOW GRADE. CABLE SHALL BE DX-SERIES ALUMINUM INTERLOCKING ARMORED (ILA) RISER RATED CABLE, BY OPTICAL CABLE CORPORATION, OR EQUAL.

Tighe&Bond

Town of Plainville

Shuttle Meadow Pump Station Rehabilitation

Plainville, Connecticut

MARK	DATE	DESCRIPTION
0	10/2023	ISSUED FOR CONSTRUCTION

PROJECT NO:	P0659-023
DATE:	OCTOBER 2023
FILE:	P0659-023-E-602.dwg
DRAWN BY:	RAK
DESIGNED/CHECKED BY:	TKV, MJR
APPROVED BY:	SES

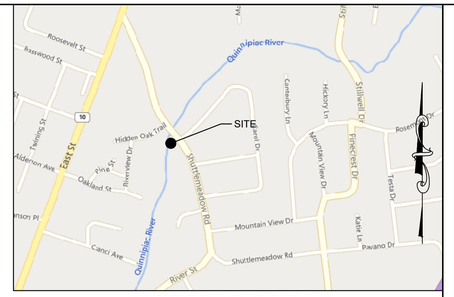
ELECTRICAL WIRING DIAGRAMS

SCALE: NO SCALE

E-602
SHEET 25 OF 25

Last Saved: 11/28/2023
Plotted: 11/28/2023 2:02pm By: SGH
Tighe & Bond J:\P\P0659 Plainville, CT\023_Shuttle Meadow WW PS\Drawings\AutoCAD\Sheets\P0659-023-E-602.dwg

CT N.A.D. 1983(2011)



SITE LOCATION MAP (NOT TO SCALE)

LEGEND:

- IRON PIN (FOUND)
- Rebar/Drill Hole (To Be Set)
- MONUMENT (FOUND)
- MANHOLE
- DRAINAGE MANHOLE
- SANITARY MANHOLE
- ELEC. MANHOLE
- TELE. MANHOLE
- "C" CATCH BASIN
- "C-L" CATCH BASIN
- DECIDUOUS TREES
- EVERGREEN TREES
- SHRUB/BUSH
- FLAG POLE
- TRAFFIC CONTROL BOX
- SIGN
- POST
- LIGHT POLE
- GUY ANCHOR
- UTILITY POLE
- WATER GATE
- WATER METER
- GAS VALVE
- GAS METER
- TRANSFORMER
- ELEC. METER
- MAIL BOX
- HAND HOLE
- BUTTON BOX
- A.C. UNIT
- TRAFFIC LIGHT POLE
- BOUNDARY LINE
- GUARD RAIL
- UNDERGROUND PIPING (San.,Stm.)
- G — U/G GAS LINE
- E — U/G ELEC. LINE
- W — WATER LINE
- \\ — OVERHEAD UTILITIES
- T — U/G TELE. LINE
- CHAIN LINK FENCE
- TREE LINE

martin
Surveying Associates, LLC
201 CHRISTIAN LANE BERLIN, CT 06037
860-832-9328 860-357-4604 (FAX)
WWW. MARTINSURVEY.COM

REVISIONS:

TOPOGRAPHIC SURVEY
SHUTTLE MEADOW PUMP STATION
TOWN OF PLAINVILLE
SHUTTLE MEADOW AVENUE
PLAINVILLE, CONNECTICUT

MSA PROJECT NO:

SCALE: 1"= 20'	DRAWN BY: GD
DATE: 10/19/2022	CHECKED BY: DGM
	SHEET: 1 OF 1

HIDDEN OAK TRAIL

OAK GROVE

QUINNIPIAC RIVER

PROPERTY LINE RUNS ALONG ℄ RIVER

SHUTTLE MEADOW ROAD

'C' CB
TF= 169.13'
18" RCP INV=166.28' (N)
18" RCP INV.=166.23'(SE)

36" RCP
INV = 164.26'

TF=169.25'
WG

SMH
TF= 168.35'
CAN'T OPEN

CL&P
#1183

BIT. CURB

BIT. SWALE

36" RCP FE
INV = 163.61'

8" V.C.P.

VINYL FENCE

24" RCP
INV = 161.7'

'C-L' CB
TF= 167.55'
INV. IN=162.45'(NE)
INV. OUT=162.35'(SW)

'C-L' CB
TF= 167.91'

GV

SMH
TF= 168.64'

SMH
TF= 167.46'

SMH
TF= 167.02'

JPN5032

TOP 12" CMP.
EL = 165.07'

TOP 12" CMP
EL = 164.37'

15" RCP

18" RCP
INV = 165.39'

TREE LINE

WL1-209 WL1-208 WL1-207 WL1-206 WL1-205 WL1-204 WL1-203 WL1-202 WL1-201

WL2-116 WL2-115 WL2-114 WL2-113 WL2-112 WL2-111 WL2-110

TOP 84" CMP.
EL = 165.55'

TOP 84" CMP.
EL = 165.69'

TOP 84" CMP.
EL = 165.50'

TOP 84" CMP
EL = 165.77'

TOP 84" CMP
EL = 165.83'

TOP 84" CMP
EL = 165.68'

CONC. WALL

CHAIN LINK FENCE

18" C.I.P.
APPROX. LOCATION OF FORCED MAIN PER PLAN

SAN. MH GATED

MON WELL

HATCH

WG

WATER MH
TF=171.23'

GATE

WET WELL ACCELERATOR

CONTROL & GENERATOR BUILDING FF=172.00'

GV

171.7'

CL&P
#48817

FIELD LOCATED ELECTRIC PAINT

FIELD LOCATED WATER PAINT

12" ? SAN

SMH
TF= 171.67'
FL=161.52'

FIELD LOCATED GAS PAINT

EDGE OF PAVEMENT

BIT. WALK

N 43°11'08" W 61.1' TO RIVER

WL1-101 WL1-102 WL1-103 WL1-104 WL1-105 WL1-106 WL1-107 WL1-108 WL1-109 WL1-110 WL1-111 WL1-112

× 166.4' × 167.5' × 168.5' × 168.2' × 168.6' × 164.4'

Location of unnumbered pole. Please note the survey is not showing the grass strip between the Edge of Pavement and the Bituminous Walk.

Δ=20°25'17"
R=657.97'
L=234.51'
CB=S 32°58'30" E
CL=233.27'

TREE LINE

N 05°35'27" W 90.80'

N/F
NIKOLAUS A. PANECZKO
VOL. 652 PG. 344

N/F
JOANNE R. PYLANT
VOL. 616 PG. 331

IRON PIN FOUND

N 67°14'09" E 40.00'

CONC. WALK

CL&P
#48820

SUBJECT PARCEL
VOL. 158 PG. 732

10 0 10 20 30
SCALE:1"=20'

MAP REFERENCES:

A. "SUBDIVISION PLAN RIVER EDGE PLAINVILLE OWNED BY BEL-AIRE CORPORATION DEVELOPED BY WILLIS DEVELOPMENT CORP." SCALE: 1"=40', BY: KRATZERT & JONES, DATED APRIL 25, 1967.

B. "TOWN OF PLAINVILLE PLAN OF SHUTTLE MEADOW ROAD SHOWING STREET LINE AND BUILDING LINES." SHEET 1&2 OF 2, SCALE: 1"=20', BY TOWN OF PLAINVILLE ENGINEERING DEPARTMENT, DATED AUGUST 1966.

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

70147
DEAN MARTIN LICENSE NO.

THIS DOCUMENT AND COPIES THEREOF ARE VALID ONLY IF THEY BEAR THE SIGNATURE AND EMBOSSED SEAL OF THE DESIGNATED LICENSED PROFESSIONAL. UNAUTHORIZED ALTERATIONS TO THIS PLAN RENDER THE DECLARATION HEREON NULL AND VOID.

MAP NOTES:

1. THIS MAP AND SURVEY HAVE BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND "THE MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" ADOPTED JUNE 21, 1996; AMENDED OCTOBER 26, 2018.
2. THE TYPE OF SURVEY PERFORMED AND THE MAPPED FEATURES DEPICTED HEREON ARE IN ACCORDANCE WITH THE REQUIREMENTS OF A TOPOGRAPHIC SURVEY.
3. THE BOUNDARY LINES DEPICTED HEREON IS BASED UPON A RESURVEY OF MAP REFERENCE 'A'.
4. THE HORIZONTAL BASELINE CONFORMS TO A CLASS A-2 ACCURACY.
   THE VERTICAL BASELINE CONFORMS TO A CLASS V-2 ACCURACY.
   THE TOPOGRAPHIC FEATURES CONFORM TO A CLASS T-2 ACCURACY.
5. THE NORTH ARROW AND BEARINGS ARE BASED UPON THE CONNECTICUT STATE COORDINATE SYSTEM N.A.D. 1983 (2011). THE ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) USING GEOID 18. COORDINATES AND ELEVATIONS WERE DETERMINED FROM RTK GPS OBSERVATIONS MADE ON OCTOBER 5, 2022, USING THE CT DOT RTK NETWORK KNOWN AS ACORN (CTNE BASE), HAVING THE FOLLOWING VALUES:

   LATITUDE = N 41° 40' 24.71719"
   LONGITUDE = W 72° 42' 52.25224"
   ELLIPSOID HEIGHT = 41.746M
6. UNDERGROUND UTILITIES, STRUCTURES AND FACILITY LOCATIONS DEPICTED AND NOTED HEREON HAVE BEEN COMPILED, IN PART FROM RECORD MAPPING SUPPLIED BY THE RESPECTIVE COMPANIES OR GOVERNMENTAL AGENCIES AND FROM OTHER SOURCES. THESE LOCATIONS MUST BE CONSIDERED AS APPROXIMATE IN NATURE. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE, THE EXISTENCE WHICH IS UNKNOWN TO MARTIN SURVEYING ASSOCIATES, LLC.. ALL CONTRACTORS ARE REQUIRED TO CONTACT CALL-BEFORE-YOU-DIG AT 1-800-922-4455 FOR LOCATION AND OR STAKEOUT OF ANY UTILITY PRIOR TO ANY EXCAVATION.