IMPORTED MATERIALS SAMPLING DESCRIPTION

Study Area
Corning, New York

1. INTRODUCTION

The New York State Department of Conservation (NYSDEC) requires sampling of soil imported for use in a soil cap, soil cover, or as backfill pursuant to Section 5.4(e) of NYSDEC's DER-10 ("*Technical Guidance for Site Investigation and Remediation*," dated May 2010; Table 1) (NYSDEC, 2010). Corning Incorporated is performing remedial activities in the Study Area under an Order on Consent and Administrative Settlement with NYSDEC (NYSDEC, 2017). The Study Area is located in the City of Corning, New York, and, in general, is bound by the Chemung River to the south; Post Creek and Interstate 86 to the east and north; and the Guthrie Medical Center, the City of Corning Fire Department, and Centerway to the west.

A Remedial Action Work Plan (RAWP) was prepared by Weston Solutions, Inc. (WESTON) on behalf of Corning Incorporated to perform remedial activities in the residential Operable Units of the Study Area (OU1, OU2 and OU5) (WESTON, 2018a). As described in the NYSDEC-approved RAWP, prior to importing backfill material, analytical samples will be collected at the backfill source to ensure the material meets the requirements for soil to be imported under DER-10 Section 5.4(e) and analytical results for soil samples will be submitted to NYSDEC for approval prior to use during the RAWP activities. As stated in Section 4.5, "*Prior to importing backfill material, analytical samples will be collected at the backfill source to ensure the material meets the requirements for soil to be imported under DER-10 Section 5.4(e). These samples will be collected and analyzed in accordance with Quality Assurance Project Plan (QAPP). Analytical results for soil samples will be submitted to NYSDEC for approval prior to use during the RAWP activities.*" In addition to the requirements of DER-10 Section 5.4(e), the source material samples will be analyzed for emerging contaminants in accordance with NYSDEC's guidance documents entitled "*Sampling for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances (PFAS) Under DEC's Part 375 Remedial Programs"* dated June 2019 (NYSDEC, 2019) and "*Guidelines for Sampling and Analysis of PFAS Under NYSDEC's Part 375 Remedial Programs*" dated October 2020

(NYSDEC, 2020), and in accordance with the Quality Assurance Project Plan (QAPP) (WESTON, 2018b) and the *Sampling Procedure Backfill Soil Sampling for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances (PFAS)* (AECOM, 2020).

The purpose of this Sampling Description is to identify the sources that will be sampled, the number and type of samples to be collected, analytical methods, laboratory deliverables, basis of the sample result evaluation, and required documentation. Additional sampling and analysis details are provided in the *Study Area Pre-Design Investigation Work Plan Residential Areas (OU1, OU2 AND OU5)* (WESTON, 2018b) and the *Sampling Procedure Backfill Soil Sampling for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances (PFAS)* (AECOM, 2020).

The fill materials requiring sampling for remediation are summarized below:

- Topsoil
- Soil from sod supplier fields
- Granular Fill (New York State Department of Transportation (NYSDOT) Item 203.07)
- Crushed Stone (NYSDOT Item 623.12) - NYSDOT Material Designation 703-0201, hard durable limestone or approved equal:
- Subbase Course, Type 2 (NYSDOT Item 304.12)
- Underdrain Filter, Type 3 (NYSDOT Item 605.1101) - NYSDOT Concrete Sand

Bagged soils will be used for landscaping. No sampling is planned for bagged soil. Additionally, no samples will be collected from fertilizer, lime, or mulch.

2. MATERIAL SOURCE IDENTIFICATION

Soil will be sampled from the following sources:

- Gridley Excavating (topsoil, granular fill, crushed stone, subbase course) – Primary Source
- Dalrymple Gravel and Construction (topsoil, granular fill, crushed stone, subbase course) – Alternate Source
- Porters Concrete Service (sand)
- Knight Settlement Sand and Gravel (sand)

Soil from sod will be sampled from the following sources:

- Batavia Turf – Primary Source
- PA State SOD, Clearfield, PA – Alternate Source

3. SAMPLING PLAN

3.1 SAMPLE TYPE AND FREQUENCY

The sample type and frequency are defined in NYSDEC Table 5.4(e)10 shown in Table 1.

Volatile organic compounds (VOCs) are analyzed on grab samples. Semivolatile organic compounds (SVOCs), inorganics and polychlorinated biphenyls (PCBs)/pesticides are analyzed on composite samples. The composite samples are prepared by mixing soil from discrete samples collected from 3 to 5 random locations. Samples for VOC analysis will be frozen, not chemically preserved. The emerging contaminants analyses will be performed on the composite samples. PFAS samples may also be collected for Synthetic Precipitation Leaching Procedure (SPLP) and held for analysis pending the results of the PFAS analyses. Note that the holding time for PFAS analysis is 14 days. The turnaround time will need to be 5 days to allow time for the SPLP analysis, if needed.

DER-10 includes a waiver to the sampling requirements defined in Table 5.4(e)10 that will be applied for coarse aggregate fill: material other than soil can be imported without chemical testing to be used as backfill beneath pavement, buildings, or part of a final site cover if it contains less than 10% by weight material passing through a size 80 sieve and consists of gravel, rock, or stone consisting of virgin material from a permitted mine or quarry.

Topsoil and granular fill will be sourced from certified mines, but the number of samples will be consistent with Table 5.4(e)10 rather than the DER-10 allowance for soil or sand imported from a virgin mine/pit. Crushed stone and the subbase course fill will not be chemically tested provided it meets the requirements for material other than soil. The proposed sampling is consistent with the source material sampling completed for the 2018 and 2019 remediation.

3.2 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Environmental duplicate and matrix/matrix-spike duplicates are required at a frequency of 1 per 20 samples. No aqueous trip blanks will be collected. Aqueous trip blanks are only required for aqueous samples. Field and equipment blanks are required at the same frequency except for PFAS, for which a field blank will be collected daily during the sampling activities.

3.3 ANALYTICAL METHODS

The analytical methods are as follows:

- VOCs – EPA Method 8260
- SVOCs – EPA Method 8270
- PCBs – EPA Method 8082
- Herbicides – EPA Method 8151
- Pesticides – EPA Methods 8081
- Metals –
  - Total Metals EPA Method 6010 (including target list arsenic, barium, beryllium, cadmium, chromium, copper, lead, manganese, nickel, selenium, silver, and zinc)
  - Mercury EPA Method 7471
  - Cyanide EPA Method 9012
  - Hexavalent Chromium EPA Method 7196
  - Trivalent Chromium EPA Method 3500
- 1,4-Dioxane – EPA Method 8270
- PFAS – LC-MS/MS using Modified EPA Method 537.1 for the PFAS Analyte List
- SPLP – EPA Method 1312

In accordance with NYSDEC's October 2020 PFAS Guidance, the laboratory must hold Environmental Laboratory Approval Program (ELAP) certification for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) in drinking water by EPA Method 537.1 or ISO 25101. Labs must also adhere to the requirements and criteria set forth in the Laboratory Guidance for Analysis of PFAS in Non-Potable Water and Solids. The reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 micrograms per kilogram (µg/kg).

Corning Incorporated is utilizing the laboratory Eurofins Test America to complete the sample analysis. Eurofins Test America has confirmed that they hold the appropriate ELAP certification and can comply with the reporting limits for all the identified PFAS compounds except for 6:2 fluorotelomer sulfonate, 8:2 fluorotelomer sulfonate, n-methyl perfluorooctanesulfonamidoacetic acid, and n-ethyl perfluorooctanesulfonamidoacetic acid. For these four compounds, Eurofins Test America can achieve a reporting limit of 2 µg/kg, which is consistent with the current industry capabilities.

Eurofins Test America's reporting limit for these four compounds is also consistent with NYSDEC's October 2020 PFAS Guidance which states that where a lab cannot achieve the 0.5 µg/kg reporting limit for solid samples, the reporting limit "should be as close to this limit as possible." NYSDEC's October 2020 PFAS Guidance goes on to state that "[i]f laboratories indicate that they are not able to achieve these reporting limits for the entire PFAS Analyte List, site-specific decisions regarding acceptance of elevated reporting limits for specific PFAS can be made by the Division of Environmental Remediation (DER) project manager in consultation with the DER chemist."

The reporting limits for the other compounds are listed in Table 2.

3.4 SAMPLING METHODS

The sampling procedures defined in the *Study Area Pre-Design Investigation Work Plan, Residential Areas (OU1, OU2 and OU5)* (WESTON, 2018b) will be followed. A representative number of the samples (approximately 50%) will be collected from 6 to 8 feet (ft) below the surface in interior portions of any stockpile. The remaining samples (approximately 50%) will be collected from 6 to 12 inches below the surface of any stockpile. The samples will be collected by hand auger or using an excavator bucket. Samples for VOC analysis will not be homogenized.

Sampling for emerging contaminants, as requested by the NYSDEC, will be conducted in accordance with the *Sampling Procedure Backfill Soil Sampling for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances (PFAS)* (AECOM, 2020) and Appendix B of *Guidelines for Sampling and Analysis of PFAS Under NYSDEC's Part 375 Remedial Programs* (NYSDEC, 2020).

Fill material stockpiles that are sampled will be set aside for Corning Incorporated use during remediation.

3.5 LABORATORY DELIVERABLES

The laboratories will provide full category B deliverables for data validation.

3.6 SAMPLE RESULT EVALUATION

The sample results will be compared to the unrestricted use soil clean up objectives (SCOs) listed in Appendix 5 of DER-10. Appendix 5 includes SCOs. For the emerging contaminants, the guidance (NYSDEC, 2020) requires the following:

- For 1,4-dioxane, soil exceeding the Unrestricted SCO of 0.1 ppm must be rejected.
- If PFOA or PFOS is detected in any sample at or above 0.66 or 0.88 part per billion (ppb), respectively, then a soil sample must be tested by SPLP and the leachate analyzed. If the SPLP results exceed 10 ppt for either PFOA or PFOS (individually), then the source of backfill must be rejected.

3.7 DOCUMENTATION

A sample log will be prepared to document the location of the sample, depth of the sample (if appropriate), sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. The discrete and composite sample locations will be sketched.

AECOM will obtain the particle distribution analysis from the supplier. Additionally, per DER-10 Section 5.4(e)6, AECOM will obtain documentation of the source of fill including:

- The name of the person providing the documentation and relationship to the source of the fill;
- The location where the fill was obtained;
- Identification of any state or local approvals as a fill source; and
- If no prior approval is available for the source, a brief history of the use of the property which is the source of the fill.

NYSDEC provides a form for summarizing the soil information –

https://www.dec.ny.gov/docs/remediation_hudson_pdf/requesttoreusesoil.pdf

4. REFERENCES

AECOM, 2020. *Sampling Procedure Backfill Soil Sampling for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances (PFAS)*. Prepared by AECOM for Corning Incorporated. February 2020.

NYSDEC, 2010. DER-10 *Technical Guidance for Site Investigation and Remediation*. May 2010.

NYSDEC, 2017. Order on Consent and Administrative Settlement, Index No. CO 8-20171204-140, Study Area, Corning, Steuben County, New York, Site ID No. 851046, December 2017.

NYSDEC, 2019. *Sampling for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances (PFAS) Under DEC's Part 375 Remedial Programs,* June 2019.

NYSDEC, 2020, *Guidelines for Sampling and Analysis of PFAS Under NYSDEC's Part 375 Remedial Programs,* October 2020.

WESTON, 2018a. *Remedial Action Work Plan, Residential Areas (OU1, OU2 and OU5), Study Area,* April 6, 2018. Prepared by WESTON for Corning Incorporated.

WESTON, 2018b. *Study Area Pre-Design Investigation Work Plan Residential Areas (OU1, OU2 AND OU5), Study Area, Corning, NY,* January 9, 2018. Prepared by WESTON for Corning Incorporated.

TABLES

Table 1 - DER-10 Table 5.4(e)10 Number of Soil Samples for Imported Soil

Table 5.4(e)10 Recommended Number of Soil Samples for Soil Imported To or Exported From a Site			
Contaminant	**VOCs**	**SVOCs, Inorganics & PCBs/Pesticides**	
Soil Quantity (cubic yards)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0-50	1	1	3-5 discrete samples from different locations in the fill being provided will comprise a composite sample for analysis
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1000	7	2	
➢ 1000	Add an additional 2 VOC and 1 composite for each additional 1000 Cubic yards or consult with DER		

AECOM

Table 2
Reporting Limits and Method Detection Limits

	Soil	
	RL	**MDL**
Target Analyte List (TAL) Metals [Method SW846 6010]	**mg/kg**	
Aluminum	10.0	4.40
Antimony	15.0	0.400
Arsenic	2.00	0.400
Barium	0.500	0.110
Beryllium	0.200	0.0280
Boron	2.00	0.190
Cadmium	0.200	0.0300
Calcium	50.0	3.30
Chromium	0.500	0.200
Cobalt	0.500	0.0500
Copper	1.00	0.210
Iron	10.0	1.10
Lead	1.00	0.240
Magnesium	20.0	0.927
Manganese	0.200	0.0320
Nickel	5.00	0.230
Potassium	30.0	20.0
Selenium	4.00	0.400
Silver	0.600	0.200
Sodium	140	13.0
Thallium	6.00	0.300
Vanadium	0.500	0.110
Zinc	2.00	0.153
Mercury [Method SW846 7471B/7470A]	**mg/kg**	
Mercury	0.0200	0.00810
Semi-Volatile Organic Compounds (SVOCs) [Method SW846 8270]	**µg/kg**	
Biphenyl	170	28.2
bis (2-chloroisopropyl) ether	170	34.0
1,4-Dioxane	100	55.0
2,4,5-Trichlorophenol	170	46.0
2,4,6-Trichlorophenol	170	34.0
2,4-Dichlorophenol	170	18.0
2,4-Dimethylphenol	170	72.7
2,4-Dinitrophenol	1660	784
2,4-Dinitrotoluene	170	35.0
2,6-Dinitrotoluene	170	20.0
2-Chloronaphthalene	170	28.0
2-Chlorophenol	170	31.0
2-Methylphenol	170	20.0
2-Methylnaphthalene	170	34.0
2-Nitroaniline	330	25.0
2-Nitrophenol	170	48.0
3,3'-Dichlorobenzidine	330	200
3-Nitroaniline	330	47.0
4,6-Dinitro-2-methylphenol	330	170
4-Bromophenyl phenyl ether	170	24.0
4-Chloro-3-methylphenol	170	42.0
4-Chloroaniline	170	42.0
4-Chlorophenyl phenyl ether	170	21.0
3&4-Methylphenol	330	20.0
4-Nitroaniline	330	89.0
4-Nitrophenol	330	159
Acenaphthene	170	25.0
Acenaphthylene	170	22.0
Acetophenone	170	23.0
Anthracene	170	42.0
Atrazine	170	59.0
Benzaldehyde	170	135
Benzo[a]anthracene	170	27.6
Benzo[a]pyrene	170	25.0
Benzo[b]fluoranthene	170	27.0

AECOM

Table 2
Reporting Limits and Method Detection Limits
(continued)

	Soil	
	RL	**MDL**
Semi-Volatile Organic Compounds (SVOCs) [Method SW846 8270] (continued)	**µg/kg**	
Benzo[g,h,i]perylene	170	19.0
Benzo[k]fluoranthene	170	22.0
Bis(2-chloroethoxy)methane	170	36.0
Bis(2-chloroethyl)ether	170	22.0
Bis(2-ethylhexyl) phthalate	170	58.0
Butyl benzyl phthalate	170	28.0
Caprolactam	170	51.0
Carbazole	170	20.0
Chrysene	170	38.0
Dibenz(a,h)anthracene	170	30.0
Di-n-butyl phthalate	170	29.0
Di-n-octyl phthalate	170	20.0
Dibenzofuran	170	20.0
Diethyl phthalate	170	22.0
Dimethyl phthalate	170	20.0
Fluoranthene	170	18.0
Fluorene	170	20.0
Hexachlorobenzene	170	23.0
Hexachlorobutadiene	170	25.0
Hexachlorocyclopentadiene	170	23.0
Hexachloroethane	170	22.0
Indeno[1,2,3-cd]pyrene	170	22.0
Isophorone	170	36.0
N-Nitrosodi-n-propylamine	170	29.0
N-Nitrosodiphenylamine	170	138
Naphthalene	170	22.0
Nitrobenzene	170	30.0
Pentachlorophenol	330	170
Phenanthrene	170	25.0
Phenol	170	26.0
Pyrene	170	20.0
Chromium [Method SW846 7196A & SM 3500_CR3_D]	**mg/kg**	
Chromium, Hexavalent	2.00	0.395
Chromium Trivalent	1.50	0.630
Cyanide [Method SW846 9012B]	**mg/kg**	
Cyanide	0.100	0.0270
Volatile Organic Compounds (VOCs) [Method SW846 8260 per DER-10 [1]]	**µg/kg**	
1,1,1-Trichloroethane	5.00	0.363
1,1-Dichloroethane	5.00	0.610
1,1-Dichloroethene	5.00	0.612
1,2,4-Trimethylbenzene	1.00	0.340
1,2-Dichlorobenzene	5.00	0.391
1,2-Dichloroethane	5.00	0.251
1,2-Dichloroethene (cis)	1.00	0.220
1,2-Dichloroethene (trans)	1.00	0.390
1,3-Dichlorobenzene	5.00	0.257
1,3,5-Trimethylbenzene	1.00	0.130
1,4-Dichlorobenzene	5.00	0.700
2-Butanone (MEK)	25.0	1.83
Acetone	25.0	4.21
Benzene	5.00	0.245
Butylbenzene	1.00	0.210
Carbon tetrachloride	5.00	0.484
Chlorobenzene	5.00	0.660
Chloroform	5.00	0.309
Ethylbenzene	5.00	0.345
Methyl tert-butyl ether	5.00	0.491
Methylene Chloride	5.00	2.30
n-Propylbenzene	1.00	0.180
sec-Butylbenzene	1.00	0.170
Tetrachloroethene	5.00	0.671
Tert-Butylbenzene	1.00	0.340
Toluene	5.00	0.378
Trichloroethene	5.00	1.10
Vinyl chloride	5.00	0.610
Xylenes, Total	10.0	0.840

AECOM

Table 2
Reporting Limits and Method Detection Limits
(continued)

	Soil	
	RL	**MDL**
Polychlorinated Biphenyls (PCBs) [Method SW846 8082]	**mg/kg**	
PCB-1016	0.0167	0.00326
PCB-1221	0.0167	0.00326
PCB-1232	0.0167	0.00326
PCB-1242	0.0167	0.00326
PCB-1248	0.0167	0.00326
PCB-1254	0.0167	0.00782
PCB-1260	0.0167	0.00782
Total PCBs	0.0167	0.00782
Per- and Polyfluoroalkyl Substances (PFAS) [Method 537.1 mod.]	**µg/kg**	
6:2 FTS	2.00	0.150
8:2 FTS	2.00	0.250
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	0.370
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	0.390
Perfluorobutanesulfonic acid (PFBS)	0.200	0.0250
Perfluorobutanoic acid (PFBA)	0.200	0.0280
Perfluorodecanesulfonic acid (PFDS)	0.200	0.0390
Perfluorodecanoic acid (PFDA)	0.200	0.0220
Perfluorododecanoic acid (PFDoA)	0.200	0.0670
Perfluoroheptanesulfonic Acid (PFHpS)	0.200	0.0350
Perfluoroheptanoic acid (PFHpA)	0.200	0.0290
Perfluorohexanesulfonic acid (PFHxS)	0.200	0.0310
Perfluorohexanoic acid (PFHxA)	0.200	0.0420
Perfluorononanoic acid (PFNA)	0.200	0.0360
Perfluorooctanesulfonamide (FOSA)	0.200	0.0820
Perfluorooctanesulfonic acid (PFOS)	0.500	0.200
Perfluorooctanoic acid (PFOA)	0.200	0.0860
Perfluoropentanoic acid (PFPeA)	0.200	0.0770
Perfluorotetradecanoic acid (PFTeA)	0.200	0.0540
Perfluorotridecanoic acid (PFTriA)	0.200	0.0510
Perfluoroundecanoic acid (PFUnA)	0.200	0.0360
Pesticides [Method SW846 8081 & Method SW846 8151 per-DER-10[1]]	**µg/kg**	
2,4,5-TP Acid (Silvex)	17.0	11.4
4,4'-DDD	6.70	0.880
4,4'-DDE	6.70	0.970
4,4'-DDT	6.70	0.690
Aldrin	6.70	0.810
Alpha-BHC	2.00	0.610
Chlordane (alpha)	6.70	1.09
Beta-BHC	2.00	0.650
Delta-BHC	2.00	0.730
Dieldrin	2.00	0.870
Endosulfan I	6.70	0.930
Endosulfan II	6.70	1.05
Endosulfan sulfate	6.70	0.780
Endrin	6.70	0.850
gamma-BHC (Lindane)	2.00	0.600
Heptachlor	6.70	0.860

Notes:
[1] - List of constituents under this analysis are from the DER-10 List (see Appendix 5, Allowable Constituent Levels for Imported Fill or Soil, Subdivision 5.4(3)).
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram
RL - Reporting Limit
MDL - Method Detection Limit
Listed limits are the highest current MDL and RL inclusive of Eurofins TestAmerica Buffalo and Edison laboratories for standard analytical testing.