Memorandum

To: *Mr. Charles Post*

From: *Mr. Stephen Mirabello*

Date: *March 10, 2017*

Subject: *Former Paul Miller Dry Cleaners Vapor Intrusion Sampling 2016*

Former Paul Miller Dry Cleaners Vapor Intrusion Sampling

CDM Smith is investigating a chlorinated solvent groundwater plume at the Former Paul Miller Dry Cleaners Site (NYSDEC Site #243018) in Staten Island, NY. From December 2013 to February 2014, CDM Smith conducted an indoor air assessment of the Site building, as well as indoor air, sub-slab vapor, interstitial wall vapor, and outdoor ambient air samples. Due to the high concentrations of PCE in sub-slab vapor and indoor air, the NYSDOH Vapor Intrusion guidance required mitigation of the Former Paul Miller Dry Cleaners building. A sub-slab depressurization system was installed in February 2016 to mitigate the indoor air concentrations of tetrachloroethylene (PCE). CDM Smith collected indoor air and sub-slab vapor samples from adjacent buildings for volatile organic compound (VOC) analysis to characterize migration of PCE vapor into the occupied structures and from the Site building to assess the performance of the sub-slab depressurization system.

On February 10-11, 2016, CDM Smith collected co-located sub-slab vapor and indoor air samples from the two properties adjacent to the Site building, 1441 Forest Avenue and 1481 Forest Avenue. On March 24-25, 2016, following installation of the sub-slab depressurization system, CDM Smith completed the vapor sampling, collecting an indoor air sample from the Former Paul Miller Dry Cleaners Site facility at 1465 Forest Avenue. This sample was collected for comparison to samples collected prior to the installation of a sub-slab depressurization system. These samples were collected in 6-liter SUMMA canisters over a 24-hour period. They were analyzed for TO-15 analysis by Alpha Analytical Laboratories. Sample locations are displayed on Figure 1.

At the 95181-IA/SS-02 location, the bank west to the Site, PCE was not detected in indoor air and was detected at 419 µg/m^3 in sub-slab vapor. Also at the 95181-IA/SS-02 location, trichloroethylene (TCE) was not detected in indoor air but was detected at 26.6 µg/m^3 in sub-slab vapor. At the 95181-IA/SS-03 location, the liquor store east of the Site, PCE was detected at 0.38 µg/m^3 in indoor air and was detected at 3.88 µg/m^3 in sub-slab vapor. TCE was not detected in either SS-03 sample. At these two sample locations, results were compared to the Soil Vapor/Indoor Air Matrix of the *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006*. Additional monitoring is recommended at the 95181-IA/SS-02 location and no further action is indicated at 95181-IA/SS-03 for both PCE and TCE. The indoor air sample collected at 95181-IA-08, the Site building, had a PCE concentration of 13.4 µg/m^3. This concentration is

significantly lower than the indoor air PCE concentrations from samples collected in 2014 and lower than the NYSDOH ambient air guideline of 30 $\mu g/m^3$. Sample results are displayed in Tables 1 and 2. A sample property index is included as Table 3.

cc: C. Gurr
Project file

Figures

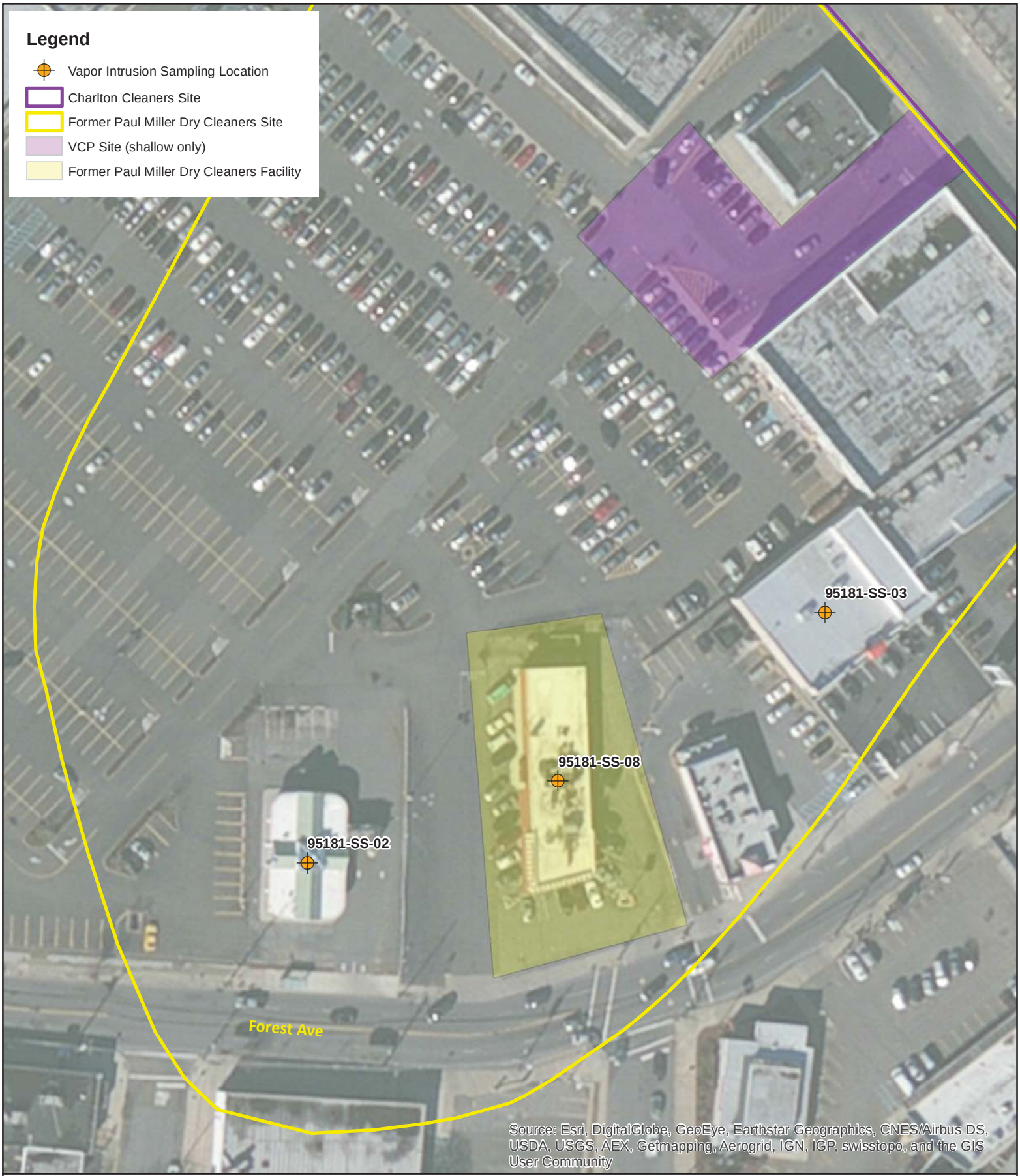

Figure 1
2016 Vapor Intrusion Sample Locations
Former Paul Miller Dry Cleaners
NYSDEC Site #243018
Staten Island, NY

N

0 25 50 75 100
Feet

CDM Smith

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Tables

Table 1
Vapor Intrusion Analytical Results
Former Paul Miller Dry Cleaners
NYSDEC Site #243018
Staten Island, NY

			Sample:	95181-IA-02-021016	95181-SS-02-021016	95181-IA-03-021016	95181-SS-03-021016	95181-IA-08-032516
			Location:	95181-SS-02	95181-SS-02	95181-SS-03	95181-SS-03	95181-SS-08
			Sample Date:	2/11/2016 11:58:00 AM	2/11/2016 11:51:00 AM	2/11/2016 3:52:00 PM	2/11/2016 9:17:00 AM	3/25/2016 10:28:00 AM
			Sample Type:	N	N	N	N	N
Chemical Name	**CAS Number**	**Unit**						
1,1,1-Trichloroethane	71-55-6	ug/m3	0.109 U	1.09 U	0.109 U	1.09 U	0.109 U
1,1,2,2-Tetrachloroethane	79-34-5	ug/m3	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	ug/m3	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U
1,1,2-Trichloroethane	79-00-5	ug/m3	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U
1,1-Dichloroethane	75-34-3	ug/m3	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,1-Dichloroethene	75-35-4	ug/m3	0.079 U	0.793 U	0.079 U	0.793 U	0.079 U
1,2,4-Trichlorobenzene	120-82-1	ug/m3	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U
1,2,4-Trimethylbenzene	95-63-6	ug/m3	0.983 U	0.983 U	2.67	1.06	0.983 U
1,2-Dibromoethane	106-93-4	ug/m3	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
1,2-Dichlorobenzene	95-50-1	ug/m3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	107-06-2	ug/m3	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,2-Dichloropropane	78-87-5	ug/m3	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	76-14-2	ug/m3	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene	108-67-8	ug/m3	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
1,3-Butadiene	106-99-0	ug/m3	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U
1,3-Dichlorobenzene	541-73-1	ug/m3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	106-46-7	ug/m3	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dioxane	123-91-1	ug/m3	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
2,2,4-Trimethylpentane	540-84-1	ug/m3	0.934 U	1.35	6.82	3.26	0.934 U
2-Butanone (MEK)	78-93-3	ug/m3	1.47 U	1.94	1.63	4.42	1.74
2-Hexanone	591-78-6	ug/m3	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
4-Ethyltoluene	622-96-8	ug/m3	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
4-Methyl-2-Pentanone (MIBK)	108-10-1	ug/m3	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U
Acetone	67-64-1	ug/m3	10.6	52.3	32.8	199	28.7
Allyl Chloride	107-05-1	ug/m3	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U
Benzene	71-43-2	ug/m3	0.658	0.639 U	1.26	1.41	0.831
Benzyl Chloride	100-44-7	ug/m3	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U
Bromodichloromethane	75-27-4	ug/m3	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U
Bromoethene	593-60-2	ug/m3	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U
Bromoform	75-25-2	ug/m3	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U
Bromomethane	74-83-9	ug/m3	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U
Carbon Disulfide	75-15-0	ug/m3	0.623 U	0.726	0.623 U	2.11	0.623 U
Carbon Tetrachloride	56-23-5	ug/m3	0.428	1.26 U	0.428	1.26 U	0.472
Chlorobenzene	108-90-7	ug/m3	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U
Chloroethane	75-00-3	ug/m3	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U
Chloroform	67-66-3	ug/m3	0.977 U	0.977 U	0.977 U	0.977 U	1.06
Chloromethane	74-87-3	ug/m3	1.46	0.413 U	1.44	0.413 U	1.31
cis-1,2-Dichloroethene	156-59-2	ug/m3	0.079 U	1.88	0.079 U	0.793 U	0.278
cis-1,3-Dichloropropene	10061-01-5	ug/m3	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Cyclohexane	110-82-7	ug/m3	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U
Dibromochloromethane	124-48-1	ug/m3	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	75-71-8	ug/m3	1.94	1.02	1.11	19.8	1.76
Ethanol	64-17-5	ug/m3	61.6	9.61	5460	156	145
Ethyl Acetate	141-78-6	ug/m3	1.8 U	1.8 U	2.56	1.8 U	1.8 U
Ethylbenzene	100-41-4	ug/m3	0.869 U	0.869 U	1.74	3.8	0.869 U
Hexachlorobutadiene	87-68-3	ug/m3	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U
Hexane	110-54-3	ug/m3	0.705 U	0.941	1.66	3.95	1.23
Isopropyl Alcohol	67-63-0	ug/m3	2.14	1.34	9.05	5.85	2.56
Tert-Butyl Methyl Ether	1634-04-4	ug/m3	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
Methylene Chloride	75-09-2	ug/m3	1.74 U	1.74 U	1.74 U	1.74 U	1.74 U
M-P-Xylene	179601-23-1	ug/m3	1.74 U	1.74 U	7.12	14.9	1.74 U
N-Heptane	142-82-5	ug/m3	0.82 U	1.91	1.04	7.13	1.43
O-Xylene	95-47-6	ug/m3	0.869 U	0.869 U	2.67	6.3	0.869 U
Styrene	100-42-5	ug/m3	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U
Tert-Butyl Alcohol	75-65-0	ug/m3	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U
Tetrachloroethene	127-18-4	ug/m3	0.136 U	419	0.38	3.88	13.4
Tetrahydrofuran	109-99-9	ug/m3	1.47 U	1.47 U	1.47 U	2.91	1.47 U
Toluene	108-88-3	ug/m3	1.03	0.754 U	7.88	4.86	2.6
trans-1,2-Dichloroethene	156-60-5	ug/m3	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U
trans-1,3-Dichloropropene	10061-02-6	ug/m3	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Trichloroethene	79-01-6	ug/m3	0.107 U	26.6	0.107 U	1.07 U	0.167
Trichlorofluoromethane	75-69-4	ug/m3	1.84	1.12 U	1.21	2.39	1.25
Vinyl Chloride	75-01-4	ug/m3	0.051 U	0.511 U	0.051 U	0.511 U	0.051 U

Notes:
N = Normal Field Sample
AB = Ambient Blank Sample
IA = Indoor Air Sample
SS = Sub-slab Vapor Sample
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U = The analyte was analyzed for, but was not detected above the sample reporting limit.
UJ = The analyte was not detected above the sample reporting limit, and the reporting limit is approximate.

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Table 2
Vapor Intrusion Field Duplicate Analytical Results
Former Paul Miller Dry Cleaners
NYSDEC Site #243018
Staten Island, NY

			Sample:	95181-IA-02-021016	95181-IA-902-021016	95181-SS-03-021016	95181-SS-903-021016	95181-IA-08-032516	95181-IA-908-032516
			Location:	95181-SS-02	95181-SS-02	95181-SS-03	95181-SS-03	95181-SS-08	95181-SS-08
			Sample Date:	2/11/2016 11:58:00 AM	2/11/2016 11:59:00 AM	2/11/2016 9:17:00 AM	2/11/2016 12:55:00 PM	3/25/2016 10:28:00 AM	3/25/2016 10:28:00 AM
			Sample Type:	N	FD	N	FD	N	FD
Chemical Name	**CAS Number**	**Unit**							
1,1,1-Trichloroethane	71-55-6	ug/m3		0.109 U	0.109 U	1.09 U	1.09 U	0.109 U	0.109 U
1,1,2,2-Tetrachloroethane	79-34-5	ug/m3		1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	ug/m3		1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U
1,1,2-Trichloroethane	79-00-5	ug/m3		1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U
1,1-Dichloroethane	75-34-3	ug/m3		0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,1-Dichloroethene	75-35-4	ug/m3		0.079 U	0.079 U	0.793 U	0.793 U	0.079 U	0.079 U
1,2,4-Trichlorobenzene	120-82-1	ug/m3		1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U
1,2,4-Trimethylbenzene	95-63-6	ug/m3		0.983 U	0.983 U	1.06	1.1	0.983 U	0.983 U
1,2-Dibromoethane	106-93-4	ug/m3		1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
1,2-Dichlorobenzene	95-50-1	ug/m3		1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	107-06-2	ug/m3		0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,2-Dichloropropane	78-87-5	ug/m3		0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U
1,2-Dichlorotetrafluoroethane	76-14-2	ug/m3		1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene	108-67-8	ug/m3		0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
1,3-Butadiene	106-99-0	ug/m3		0.442 U	0.442 U	0.442 U	0.442 U	0.442 U	0.442 U
1,3-Dichlorobenzene	541-73-1	ug/m3		1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	106-46-7	ug/m3		1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dioxane	123-91-1	ug/m3		0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
2,2,4-Trimethylpentane	540-84-1	ug/m3		0.934 U	0.934 U	3.26	3.57	0.934 U	0.934 U
2-Butanone (MEK)	78-93-3	ug/m3		1.47 U	1.47 U	4.42	3.89	1.74	1.55
2-Hexanone	591-78-6	ug/m3		0.82 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
4-Ethyltoluene	622-96-8	ug/m3		0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
4-Methyl-2-Pentanone (MIBK)	108-10-1	ug/m3		2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U
Acetone	67-64-1	ug/m3		10.6	9.62	199	162	28.7	29.2
Allyl Chloride	107-05-1	ug/m3		0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U
Benzene	71-43-2	ug/m3		0.658	0.639 U	1.41	1.12	0.831	0.888
Benzyl Chloride	100-44-7	ug/m3		1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U
Bromodichloromethane	75-27-4	ug/m3		1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U
Bromoethene	593-60-2	ug/m3		0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U
Bromoform	75-25-2	ug/m3		2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U
Bromomethane	74-83-9	ug/m3		0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U
Carbon Disulfide	75-15-0	ug/m3		0.623 U	0.623 U	2.11	2.34	0.623 U	0.623 U
Carbon Tetrachloride	56-23-5	ug/m3		0.428	0.428	1.26 U	1.26 U	0.472	0.459
Chlorobenzene	108-90-7	ug/m3		0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U
Chloroethane	75-00-3	ug/m3		0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U
Chloroform	67-66-3	ug/m3		0.977 U	0.977 U	0.977 U	0.977 U	1.06	1.08
Chloromethane	74-87-3	ug/m3		1.46	1.37	0.413 U	0.413 U	1.31	1.28
cis-1,2-Dichloroethene	156-59-2	ug/m3		0.079 U	0.079 U	0.793 U	0.793 U	0.278	0.278
cis-1,3-Dichloropropene	10061-01-5	ug/m3		0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Cyclohexane	110-82-7	ug/m3		0.688 U	0.688 U	0.688 U	0.688 U	0.688 U	0.688 U
Dibromochloromethane	124-48-1	ug/m3		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	75-71-8	ug/m3		1.94	2	19.8	20	1.76	2.25
Ethanol	64-17-5	ug/m3		61.6	59	156	125	145	144
Ethyl Acetate	141-78-6	ug/m3		1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Ethylbenzene	100-41-4	ug/m3		0.869 U	0.869 U	3.8	3.8	0.869 U	0.869 U
Hexachlorobutadiene	87-68-3	ug/m3		2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U
Hexane	110-54-3	ug/m3		0.705 U	0.705 U	3.95	3.95	1.23	1.35
Isopropyl Alcohol	67-63-0	ug/m3		2.14	1.98	5.85	4.87	2.56	1.95
Tert-Butyl Methyl Ether	1634-04-4	ug/m3		0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
Methylene Chloride	75-09-2	ug/m3		1.74 U	1.74 U	1.74 U	1.74 U	1.74 U	1.74 U
M-P-Xylene	179601-23-1	ug/m3		1.74 U	1.74 U	14.9	14.9	1.74 U	1.74 U
N-Heptane	142-82-5	ug/m3		0.82 U	0.82 U	7.13	7.46	1.43	1.61
O-Xylene	95-47-6	ug/m3		0.869 U	0.869 U	6.3	5.95	0.869 U	0.869 U
Styrene	100-42-5	ug/m3		0.852 U	0.852 U	0.852 U	0.852 U	0.852 U	0.852 U
Tert-Butyl Alcohol	75-65-0	ug/m3		1.52 U	1.52 U	1.52 U	1.52 U	1.52 U	1.52 U
Tetrachloroethene	127-18-4	ug/m3		0.136 U	0.136 U	3.88	4.06	13.4	13.3
Tetrahydrofuran	109-99-9	ug/m3		1.47 U	1.47 U	2.91	2.51	1.47 U	1.47 U
Toluene	108-88-3	ug/m3		1.03	0.901	4.86	4.48	2.6	2.94
trans-1,2-Dichloroethene	156-60-5	ug/m3		0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U
trans-1,3-Dichloropropene	10061-02-6	ug/m3		0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Trichloroethene	79-01-6	ug/m3		0.107 U	0.107 U	1.07 U	1.07 U	0.167	0.172
Trichlorofluoromethane	75-69-4	ug/m3		1.84	1.81	2.39	2.55	1.25	1.39
Vinyl Chloride	75-01-4	ug/m3		0.051 U	0.051 U	0.511 U	0.511 U	0.051 U	0.051 U

Notes:
N = Normal Field Sample
FD = Field Duplicate Sample
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U = The analyte was analyzed for, but was not detected above the sample reporting limit.
UJ = The analyte was not detected above the sample reporting limit; and the reporting limit is approximate.
SS = sub-slab vapor sample
IA = indoor air sample

CDM Smith

Table 3
Property Sample Index
Former Paul Miller Dry Cleaners
NYSDEC Site #243018
Staten Island, NY

Sample Location	Property Address	Indoor Air Sample	Sub-slab Vapor Sample	Notes
95181-SS-02	1481 Forest Avenue	95181-IA-02-021016	95181-SS-02-021016	Commercial bank property
95181-SS-03	1441 Forest Avenue	95181-IA-03-021016	95181-SS-03-021016	Commercial liquor store property
95181-SS-08	1465 Forest Avenue	95181-IA-08-032516	NC	Commercial restaurant property

Note: All addresses are located in Staten Island, NY
NC = Not collected

CDM Smith

Post, Charles H (DEC)

From: Post, Charles H (DEC)
Sent: Tuesday, September 05, 2017 3:11 PM
To: 'Mirabello, Stephen'
Cc: Gurr, Christopher; Tomaselli, Travis
Subject: RE: 2016 Paul Miller VI Tech Memo

All,
I believe this is repetition, but for the sake of electronic housekeeping I am resending this message. The Department has received and reviewed the 2016 Former Paul Miller Dry Cleaners Vapor Intrusion Sampling report and hereby approves it.
Charlie

From: Mirabello, Stephen [mailto:MirabelloSA@cdmsmith.com]
Sent: Friday, March 10, 2017 4:08 PM
To: Post, Charles H (DEC) <charles.post@dec.ny.gov>
Cc: Gurr, Christopher <gurrc@cdmsmith.com>; Tomaselli, Travis <tomasellit@cdmsmith.com>
Subject: 2016 Paul Miller VI Tech Memo

Charlie,

CDM Smith is pleased to submit a technical memorandum for the 2016 vapor sampling at the Paul Miller site. Please let me know if there are any questions or concerns.

Thank you,

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