Hnat, John J - DNR

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Sent:	Friday, July 28, 2017 10:54 AM
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Subject:	Solenis July 27th, 2017 Meeting

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Everyone,

From our meeting on July 27th, I've listed the DNR's comments and recommendations. If I forgot anything or you would like to add anything I've missed, please reply. Generally, your proposal is the next step in the site investigation. Hopefully, this list will add or help you achieve your site investigation goals. Minor adjustments to your proposal are forthcoming and at that time we will review and respond with a letter on the final proposal as requested.

- See attached map Figure 8 for references below.
- The DNR agrees that the free product should be bailed out of groundwater monitoring wells MW-1 and MW-2 prior to abandoning the wells.
- We recommend that over drilling and replacing MW-1 and MW-2 should be delayed until the additional soil sampling and defining the extent of free product over the area of the former ASTs be completed first. This would generally provide information where additional wells may be placed in order to recover free product. It would also present a clearer understanding on how free product decreases in concentration values towards the other monitoring wells.
- We discussed the possibility that the "deep" free product found in MW-1 and MW-2 may have been the result of communication from CVOCs at a shallower depth that migrated down to the lower depth during drilling activities. The silty clays for this site may prevent the CVOCs from migrating to deeper depths. Defining the free product area may result in "shallower" monitoring wells with shorter screens across the CVOC plume.
- 1,4-dichlorobenzene (1,4-DCB) was analyzed in soil borings SB-6 (1.23 ppm at 1-3 ft.) and SB-12 (38 ppm at 2.5 – 5 feet). This compound doesn't show up in any other soil sample. Sigma will research this compound and try to explain the presence in these soil borings. Solenis stated that the facility didn't use the compound. An online search indicated that the uses of 1,4-DCB included control of moths, molds, mildew, as a pesticide, and disinfectant.
- We recommend additional investigation downgradient from soil boring location SB-7. SB-7 indicates 1,2-DCP increasing in concentration from 0.156 ppm at 3-5 feet to 213 ppm at 12.5-15 feet. The groundwater table varies from 12 feet (MW-8) to 3.3 feet at MW-12. The groundwater contamination plume may be migrating east of SB-7. Therefore, we recommend additional soil/groundwater sampling in this area and possibly a NR 141 groundwater monitoring well to continue defining the GW plume.

- Depending on the results of investigation east of SB-7, we discussed the possibility of extending the investigation east of the railroad right-of-way for degree and extent in the future.
- The area between the former AST and where the new building foundation is proposed has limited soil sampling. Triethylamine (TEA) is above the groundwater pathway RCL in SB-8, SB-9, SB-10, SB-3, and TP-3. Additionally, there are some petroleum compounds above their groundwater pathway RCLs in TP-3, SB-3, SB-9 ("J" flag for toluene), and SB-6. We recommend additional soil sampling in the areas south of SB-10 and west of SB-3/TP-3; north of SB-3 and SB-1 towards SB-4 and SB-9 for VOCs for degree and extent.
- For the proposed building site, the use of soil gas results prior to the foundation construction doesn't establish site conditions after being built. The effect a future building will have on any migration of vapors or accumulation beneath the foundation cannot be determined until the building is in-place. Soil gas samples alone can't rule out the vapor pathway when other vapor screening criteria are exceeded, i.e., CVOC contamination greater than the enforcement standard (ES) in groundwater. For instance, MW-10 has 1,2-DCP at 92 ppb (ES = 5 ppb) at ~9 feet. There is a potential that vapors may accumulate beneath the future building foundation. If you can't rule out a vapor migration potential, then your possible options would be to wait and install sampling points during construction of the foundation for future testing, install vapor access points for testing after foundation installation, or install a vapor mitigation system during construction.
- Completing the site investigation may result in a remedial action prior to construction of the building.
- Please forward the construction plans for the building when available.

If you have any questions, please call or email me. Thank you and have a great weekend.

Solenis Fig 8.pdf

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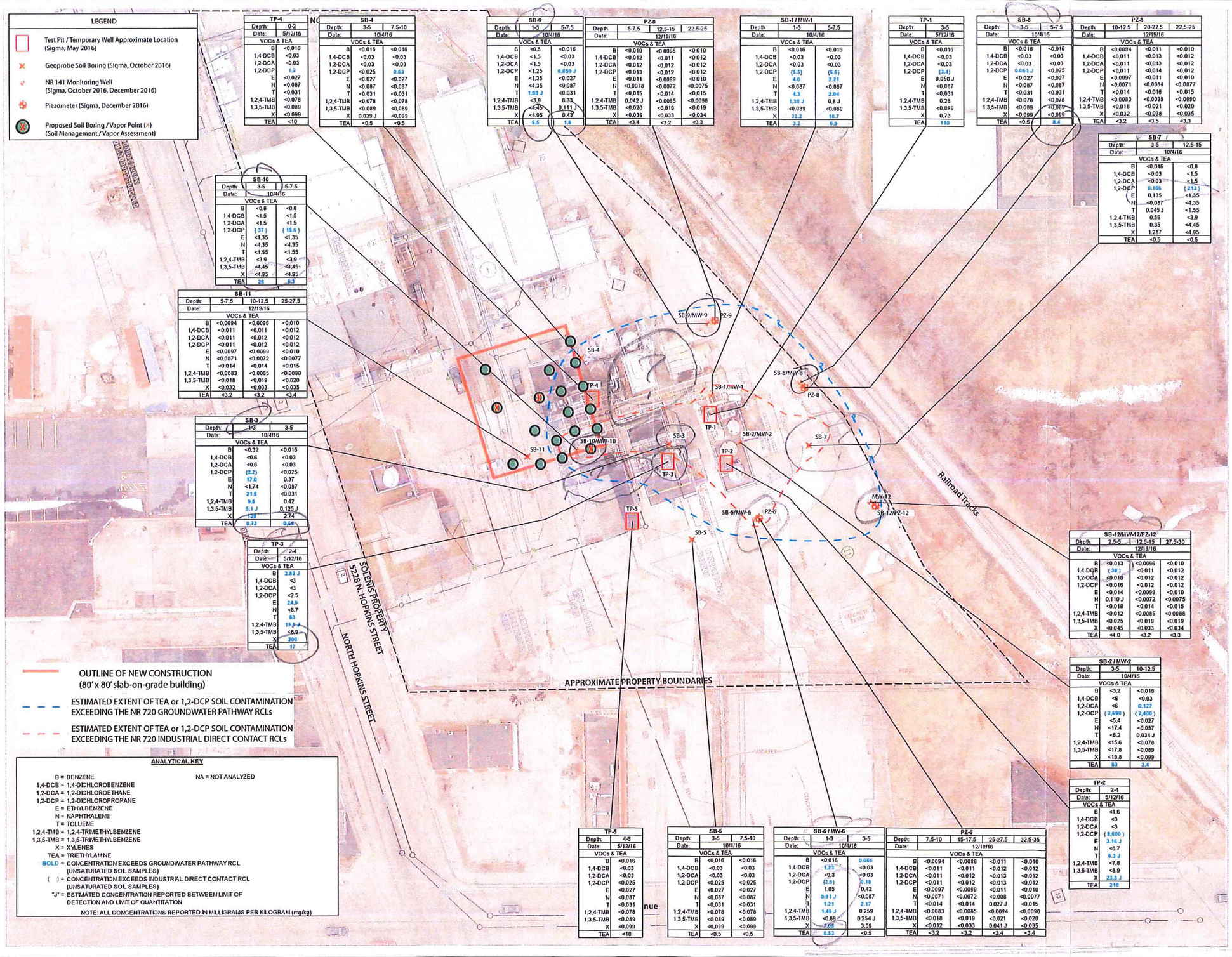

TP-4		
Depth:	0-2	
Date:	5/12/16	
VOCs & TEA		
B	<0.016	
1,4-DCB	<0.03	
1,2-DCA	<0.03	
1,2-DCP	1.2	
E	<0.027	
N	<0.087	
T	<0.031	
1,2,4-TMB	<0.078	
1,3,5-TMB	<0.089	
X	<0.099	
TEA	<10	

SB-4		
Depth:	3-5	7.5-10
Date:	10/4/16	
VOCs & TEA		
B	<0.016	<0.016
1,4-DCB	<0.03	<0.03
1,2-DCA	<0.03	<0.03
1,2-DCP	<0.025	0.63
E	<0.027	<0.027
N	<0.087	<0.087
T	<0.031	<0.031
1,2,4-TMB	<0.078	<0.078
1,3,5-TMB	<0.089	<0.089
X	0.039 J	<0.099
TEA	<0.5	<0.5

SB-9		
Depth:	1-3	5-7.5
Date:	10/4/16	
VOCs & TEA		
B	<0.8	<0.016
1,4-DCB	<1.5	<0.03
1,2-DCA	<1.5	<0.03
1,2-DCP	<1.25	0.059 J
E	<1.35	<0.027
N	<4.35	<0.087
T	1.93 J	<0.031
1,2,4-TMB	<3.9	0.33
1,3,5-TMB	<4.45	0.111 J
X	<4.95	0.43
TEA	5.5	1.6

PZ-9			
Depth:	5-7.5	12.5-15	22.5-25
Date:	12/19/16		
VOCs & TEA			
B	<0.010	<0.0096	<0.010
1,4-DCB	<0.012	<0.011	<0.012
1,2-DCA	<0.012	<0.012	<0.012
1,2-DCP	<0.013	<0.012	<0.012
E	<0.011	<0.0099	<0.010
N	<0.0078	<0.0072	<0.0075
T	<0.015	<0.014	<0.015
1,2,4-TMB	0.042 J	<0.0085	<0.0088
1,3,5-TMB	<0.020	<0.019	<0.019
X	<0.036	<0.033	<0.034
TEA	<3.4	<3.2	<3.3

SB-1 / MW-1		
Depth:	1-3	5-7.5
Date:	10/4/16	
VOCs & TEA		
B	<0.016	<0.016
1,4-DCB	<0.03	<0.03
1,2-DCA	<0.03	<0.03
1,2-DCP	(5.5)	(5.6)
E	4.0	2.11
N	<0.087	<0.087
T	4.3	2.04
1,2,4-TMB	1.38 J	0.8 J
1,3,5-TMB	<0.089	<0.089
X	32.2	16.7
TEA	3.2	6.9

TP-1	
Depth:	3-5
Date:	5/12/16
VOCs & TEA	
B	<0.016
1,4-DCB	<0.03
1,2-DCA	<0.03
1,2-DCP	(3.4)
E	0.050 J
N	<0.087
T	<0.031
1,2,4-TMB	0.28
1,3,5-TMB	<0.089
X	0.73
TEA	110

SB-8		
Depth:	3-5	5-7.5
Date:	10/4/16	
VOCs & TEA		
B	<0.016	<0.016
1,4-DCB	<0.03	<0.03
1,2-DCA	<0.03	<0.03
1,2-DCP	0.261 J	<0.025
E	<0.027	<0.027
N	<0.087	<0.087
T	<0.031	<0.031
1,2,4-TMB	<0.078	<0.078
1,3,5-TMB	<0.089	<0.089
X	<0.099	<0.099
TEA	<0.5	8.4

PZ-8			
Depth:	10-12.5	20-22.5	22.5-25
Date:	12/19/16		
VOCs & TEA			
B	<0.0094	<0.011	<0.010
1,4-DCB	<0.011	<0.013	<0.012
1,2-DCA	<0.011	<0.013	<0.012
1,2-DCP	<0.011	<0.014	<0.012
E	<0.0097	<0.011	<0.010
N	<0.0071	<0.0084	<0.0077
T	<0.014	<0.016	<0.015
1,2,4-TMB	<0.0083	<0.0098	<0.0090
1,3,5-TMB	<0.018	<0.021	<0.020
X	<0.032	<0.038	<0.035
TEA	<3.2	<3.5	<3.3

SB-7		
Depth:	3-5	12.5-15
Date:	10/4/16	
VOCs & TEA		
B	<0.016	<0.8
1,4-DCB	<0.03	<1.5
1,2-DCA	<0.03	<1.5
1,2-DCP	0.106	(213)
E	0.135	<1.35
N	<0.087	<4.35
T	0.045 J	<1.55
1,2,4-TMB	0.56	<3.9
1,3,5-TMB	0.35	<4.45
X	1.287	<4.95
TEA	<0.5	<0.5

SB-10		
Depth:	3-5	5-7.5
Date:	10/4/16	
VOCs & TEA		
B	<0.8	<0.8
1,4-DCB	<1.5	<1.5
1,2-DCA	<1.5	<1.5
1,2-DCP	(37)	(15.6)
E	<1.35	<1.35
N	<4.35	<4.35
T	<1.55	<1.55
1,2,4-TMB	<3.9	<3.9
1,3,5-TMB	<4.45	<4.45
X	<4.95	<4.95
TEA	26	8.3

SB-11			
Depth:	5-7.5	10-12.5	25-27.5
Date:	12/19/16		
VOCs & TEA			
B	<0.0094	<0.0096	<0.010
1,4-DCB	<0.011	<0.011	<0.012
1,2-DCA	<0.011	<0.012	<0.012
1,2-DCP	<0.011	<0.012	<0.012
E	<0.0097	<0.0099	<0.010
N	<0.0071	<0.0072	<0.0077
T	<0.014	<0.014	<0.015
1,2,4-TMB	<0.0083	<0.0085	<0.0090
1,3,5-TMB	<0.018	<0.019	<0.020
X	<0.032	<0.033	<0.035
TEA	<3.2	<3.2	<3.4

SB-3		
Depth:	1-3	3-5
Date:	10/4/16	
VOCs & TEA		
B	<0.32	<0.016
1,4-DCB	<0.6	<0.03
1,2-DCA	<0.6	<0.03
1,2-DCP	(2.7)	<0.025
E	17.0	0.37
N	<1.74	<0.087
T	21.5	<0.031
1,2,4-TMB	9.8	0.42
1,3,5-TMB	5.1 J	0.125 J
X	128	2.74
TEA	0.73	0.56

TP-3	
Depth:	2-4
Date:	5/12/16
VOCs & TEA	
B	2.82 J
1,4-DCB	<3
1,2-DCA	<3
1,2-DCP	<2.5
E	24.9
N	<8.7
T	63
1,2,4-TMB	15.5 J
1,3,5-TMB	<8.9
X	200
TEA	17

SB-12/MW-12/PZ-12			
Depth:	2.5-5	12.5-15	27.5-30
Date:	12/19/16		
VOCs & TEA			
B	<0.013	<0.0096	<0.010
1,4-DCB	(38)	<0.011	<0.012
1,2-DCA	<0.016	<0.012	<0.012
1,2-DCP	<0.016	<0.012	<0.012
E	<0.014	<0.0099	<0.010
N	0.110 J	<0.0072	<0.0075
T	<0.019	<0.014	<0.015
1,2,4-TMB	<0.012	<0.0085	<0.0088
1,3,5-TMB	<0.025	<0.019	<0.019
X	<0.045	<0.033	<0.034
TEA	<4.0	<3.2	<3.3

SB-2 / MW-2		
Depth:	3-5	10-12.5
Date:	10/4/16	
VOCs & TEA		
B	<3.2	<0.016
1,4-DCB	<6	<0.03
1,2-DCA	<6	0.127
1,2-DCP	(2,690)	(2,400)
E	<5.4	<0.027
N	<17.4	<0.087
T	<6.2	0.034 J
1,2,4-TMB	<15.6	<0.078
1,3,5-TMB	<17.8	<0.089
X	<19.8	<0.099
TEA	83	3.4

TP-2	
Depth:	2-4
Date:	5/12/16
VOCs & TEA	
B	<1.6
1,4-DCB	<3
1,2-DCA	<3
1,2-DCP	(8,600)
E	3.16 J
N	<8.7
T	6.3 J
1,2,4-TMB	<7.8
1,3,5-TMB	<8.9
X	23.3 J
TEA	210

TP-5	
Depth:	4-6
Date:	5/12/16
VOCs & TEA	
B	<0.016
1,4-DCB	<0.03
1,2-DCA	<0.03
1,2-DCP	<0.025
E	<0.027
N	<0.087
T	<0.031
1,2,4-TMB	<0.078
1,3,5-TMB	<0.089
X	<0.099
TEA	<10

SB-5		
Depth:	3-5	7.5-10
Date:	10/4/16	
VOCs & TEA		
B	<0.016	<0.016
1,4-DCB	<0.03	<0.03
1,2-DCA	<0.03	<0.03
1,2-DCP	<0.025	<0.025
E	<0.027	<0.027
N	<0.087	<0.087
T	<0.031	<0.031
1,2,4-TMB	<0.078	<0.078
1,3,5-TMB	<0.089	<0.089
X	<0.099	<0.099
TEA	<0.5	<0.5

SB-6 / MW-6		
Depth:	1-3	3-5
Date:	10/4/16	
VOCs & TEA		
B	<0.016	0.056
1,4-DCB	1.23	<0.03
1,2-DCA	<0.3	<0.03
1,2-DCP	(2.6)	0.18
E	1.05	0.42
N	0.91 J	<0.087
T	1.21	2.17
1,2,4-TMB	1.46 J	0.259
1,3,5-TMB	<0.89	0.254 J
X	7.05	3.09
TEA	0.33	<0.5

PZ-6				
Depth:	7.5-10	15-17.5	25-27.5	32.5-35
Date:	12/19/16			
VOCs & TEA				
B	<0.0094	<0.0096	<0.011	<0.010
1,4-DCB	<0.011	<0.011	<0.012	<0.012
1,2-DCA	<0.011	<0.012	<0.013	<0.012
1,2-DCP	<0.011	<0.012	<0.013	<0.012
E	<0.0097	<0.0099	<0.011	<0.010
N	<0.0071	<0.0072	<0.008	<0.0077
T	<0.014	<0.014	0.027 J	<0.015
1,2,4-TMB	<0.0083	<0.0085	<0.0094	<0.0090
1,3,5-TMB	<0.018	<0.019	<0.021	<0.020
X	<0.032	<0.033	0.041 J	<0.035
TEA	<3.2	<3.2	<3.4	<3.4

ANALYTICAL KEY

B = BENZENE
1,4-DCB = 1,4-DICHLOROBENZENE
1,2-DCA = 1,2-DICHLOROETHANE
1,2-DCP = 1,2-DICHLOROPROPANE
E = ETHYLBENZENE
N = NAPHTHALENE
T = TOLUENE
1,2,4-TMB = 1,2,4-TRIMETHYLBENZENE
1,3,5-TMB = 1,3,5-TRIMETHYLBENZENE
X = XYLENES
TEA = TRIETHYLAMINE
BOLD = CONCENTRATION EXCEEDS GROUNDWATER PATHWAY RCL (UNSATURATED SOIL SAMPLES)
( ) = CONCENTRATION EXCEEDS INDUSTRIAL DIRECT CONTACT RCL (UNSATURATED SOIL SAMPLES)
"J" = ESTIMATED CONCENTRATION REPORTED BETWEEN LIMIT OF DETECTION AND LIMIT OF QUANTITATION
NA = NOT ANALYZED
NOTE: ALL CONCENTRATIONS REPORTED IN MILLIGRAMS PER KILOGRAM (mg/kg)

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GRAPHIC SCALE
0 30 60

SOLENIS
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MILWAUKEE, WISCONSIN

NEW CONSTRUCTION
PROPOSED SOIL BORING / VAPOR PROBE LOCATION MAP

NO.	REVISION	DATE	BY

DRAWING NO.	16153-Site Area Map.dwg
DRAWN BY:	CCK / VMS
DATE:	1/11/17
PROJECT NO.	16153
CHECKED BY:	---
APPROVED BY:	

FIGURE
8

File: I:\Solenis\16153 - Contaminated soil_water\060 CADIE - Environmental\AI Graphics\16153-Site Area Map.dwg 1/11/2017 9:54 AM