MEMORANDUM



To:	Billy Meyer	
From:	Christie Zawtocki, PE Timothy Klotz	
Date:	December 3, 2013	
Project:	One Hour Martinizing Site, DSCA ID 32-0013 1103 W Club Blvd, Durham, NC	
Subject:	Monthly Update	

Hart & Hickman, PC (H&H) is proceeding with implementation of the Remedial Action Plan (RAP) for the One Hour Martinizing site. A brief summary of recently completed activities and upcoming activities is provided below. An updated project calendar is attached.

Monthly Vapor Field Screening

On November 13, 2013, H&H completed a monthly vapor field screening event at the site. The event included measuring total volatile organic compounds (VOCs), methane, carbon dioxide, and oxygen in soil vapor, indoor air, and outdoor ambient air. The primary purpose of the sampling is to confirm methane levels are within acceptable standards. Measurements were collected at the following locations:

- Soil Vapor Monitoring Points: SV-8S, SV-8I, SV-18S, SV-19S, SV-20S, SV-20D, SV-29S, SV-55S, SV-55I
- Excavation Vent Exhaust Pipe
- Sub-Slab Depressurization (SSD) System Exhaust and Indoor Air at 1414 Watts St (Triangle Family Church)
- Ambient, Outdoor Air on Source Property

The field screening data are summarized in the attached Table 1, and the methane readings are shown on the attached Figure 1. Recorded field measurements indicate that methane was detected in the sampled source property soil vapor points (SV-8S, SV-8I, SV-55S and SV-55I) at low levels ranging from 0.2 to 0.4% by volume. These methane readings are well within acceptable levels. The monthly methane field readings generally appear to be stable or decreasing over time between January 2013 and November 2013.

Methane was detected in the vapors from the excavation passive exhaust vent at a level of 15.8% by volume. These vapors are exhausted into the atmosphere through the stack installed on the source property where they dissipate into the atmosphere. Ambient air monitoring conducted

near ground level in the immediate vicinity of the exhaust vent did not detect methane. Methane also was not detected in the sub-slab depressurization system exhaust or indoor air at the Triangle Family Church at 1414 Watts St.

VOCs were detected in each of the monitored soil vapor points. The highest VOC concentration was detected in the source property soil vapor point SV-55S (444 ppm) located near the source excavation area. The vapor points will continue to be monitored on a monthly basis to evaluate changes over time. The next monthly field screening event is scheduled for December 18, 2013.

Indoor Air Monitoring

H&H is continuing quarterly indoor air monitoring at the three structures adjacent to the source property where vapor mitigation systems are in place (1419 Dollar St, 1421 Dollar St, and 1414 Watts St). The next quarterly sampling event is planned for December 2013. During the December sampling event, H&H will collect two 14-day Radiello samples from the 1419 and 1421 Dollar St residences and two 3-hour Summa canister indoor air samples from the Triangle Family Church at 1414 Watts St during the church's Sunday service. The indoor air samples will be submitted for laboratory analysis of tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), and vinyl chloride (VC).

Injection of EHC

The RAP includes injection of EHC (a commercial remediation product that contains zero-valent iron and carbon) to treat groundwater impacts at the source property targeting PCE groundwater concentrations of 15 mg/L or greater. The injection plan proposed in the RAP was based on groundwater data from 2009. Based on the August and September 2013 groundwater sampling results, the EHC injection plan has been modified to target the current extent of PCE impacts exceeding 15 mg/L. The attached Figures 2A and 2B depict the extent of groundwater PCE impacts exceeding 15 mg/L in the shallow and intermediate groundwater zones at the site and the modified injection layout. The modified injection plan includes 30 shallow injection locations and 14 intermediate injection locations. The shallow injections will target a vertical interval from approximately 22 to 40 ft below ground surface (bgs), and the intermediate injection Control (UIC) Program has approved the modified injection plan.

Based on the injection contractor's availability, the EHC injection activities are scheduled to begin the week of January 6, 2013. As shown in Figure 2A, the shallow injection includes points on the 1414 Watts St property. The DSCA Program is working to obtain permission from the property owner for these injection locations.



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Pre-Injection Sampling Activities

In accordance with the RAP, H&H will collect groundwater and soil gas samples prior to performing the EHC injection to establish baseline, pre-injection site conditions. The pre-injection groundwater and soil gas sampling activities are scheduled for the week of December 16, 2013. During the pre-injection sampling event, groundwater samples will be collected from the following locations:

- Source property: MW-3R, MW-3I, MW-4R, MW-4I, MW-21, MW-22S, MW-22I, MW-23S, MW-23I
- West of source property: MW-10
- South of source property: MW-15S, MW-15I, MW-18
- East of source property: MW-14S, MW-14I, MW-16S, MW-16I

The groundwater samples will be analyzed for volatile organic compounds (VOCs) by EPA Method 8260 to evaluate current concentrations of dry-cleaning related constituents. In accordance with the UIC permit, the groundwater samples will also be evaluated for pH, temperature, dissolved oxygen, conductivity, oxidation-reduction potential, methane, ethane, and ethene.

The pre-injection soil gas sampling event will include collecting soil gas samples from the locations listed below for analysis of PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, and VC by EPA Method TO-15.

- Source property: SV-8S, SV-8I, SV-17, SV-55S, SV-55I
- West of source property: SV-49, SV-50
- South of source property: SV-27S, SV-27D, SV-28D
- East of source property: SV-18, SV-19, SV-20S, SV-20D, SV-21S, SV-21D, SV-25S, SV-29S, SV-36S

Following completion of the EHC injection activities, monthly post-injection groundwater and soil gas sampling will be conducted for three months. The post-injection sampling events will include sampling the same locations and performing the same analyses as the pre-injection sampling event. Additional post-injection monitoring activities will include indoor air sampling and vapor field screening, as described in the RAP. An updated calendar which shows the pre-and post-injection schedule through April 2013 is attached.

Information Session

The DSCA Program is holding a public information session on Thursday, December 5, 2013 from 7:00 to 8:30 pm in the cafeteria of George Watts Elementary School located at 700 Watts Street in Durham. The information session will provide an update of the planned injection activities and site data pertinent to the injection strategy.



TABLE

Table 1: Soil Vapor Point and Indoor/Outdoor Air Field Measurements ADT 1						
DSCA ID N	o.: 32-0013	;				
Sample ID	Depth [feet bgs]	Sampling Date (mm/dd/yy)	Total Volatile Organic E Compounds (VOC)	% Methane	% Carbon Dioxide	% Oxygen
U1		11/27/12	427	0.1	1.7	20.0
SV-8S SV-8I	5.00	01/08/13 02/07/13 03/08/13 04/08/13 05/08/13 06/13/13 07/08/13 08/14/13 09/11/13 10/09/13 11/13/13 11/27/12 01/08/13 02/07/13 03/08/13 04/08/13 05/08/13	1,833 NA NA 465 473 360 349 427 423 313 385 >9,999 2222 NM NM 4,098 1,720 248	$\begin{array}{c} 0.8 \\ 0.1 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.1 \\ 0.2 \\ 0.3 \\ 0.2 \\ 0.0 \\ 1.3 \\ 0.2 \\ 0.1 \\ 0.2 \\ 0.1 \\ 0.2 \\ 0.2 \\ 0.2 \\ 0.2 \\ 0.2 \end{array}$	$\begin{array}{c} 2.2 \\ 2.0 \\ 2.4 \\ 2.4 \\ 4.1 \\ 5.7 \\ 5.8 \\ 5.4 \\ 4.1 \\ 3.0 \\ 3.4 \\ 2.5 \\ 2.8 \\ 2.2 \\ 2.4 \\ 1.8 \\ 3.9 \\ 1.8 \end{array}$	$\begin{array}{c} 18.7 \\ 19.2 \\ 18.8 \\ 17.7 \\ 15.7 \\ 13.7 \\ 13.4 \\ 15.6 \\ 15.1 \\ 18.0 \\ 16.2 \\ 18.8 \\ 18.3 \\ 18.6 \\ 17.9 \\ 17.6 \\ 13.3 \\ 16.5 \end{array}$
5V-81		07/08/13 08/14/13 09/11/13 10/09/13 11/13/13 11/27/12 01/08/13	305 165 3,056 119 310 22.3 51.1	0.2 0.3 0.2 0.5 0.3 0.0 0.4	2.3 2.1 1.2 2.5 1.8 2.5 0.0	15.9 15.6 11.2 15.9 12.4 19.2 21.5
SV-18S	5.00	02/07/13 03/08/13 04/08/13 05/08/13 06/13/13 08/14/13 09/11/13 10/09/13 11/13/13	NM NM 2.1 14.9 20.7 26.1 84.5 201 102	$\begin{array}{c} 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.1 \\ 0.1 \\ 0.0 \\ 0.0 \\ 0.0 \\ \end{array}$	2.3 4.1 2.5 4.9 4.7 3.0 2.9 3.5 3.1	18.6 16.9 18.1 15.9 16.2 18.2 16.5 17.5 16.8
SV-19S	5.00	11/27/12 01/08/13 02/07/13 03/08/13 04/08/13 05/08/13 06/13/13 08/15/13 09/11/13 10/09/13 11/13/13	2.25 4.50 NM 1.2 0.9 6.2 4.4 22.9 156 86.4	0.0 0.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	10.8 9.1 8.6 8.3 9.1 9.7 9.2 10.1 11.9 9.8	11.5 13.3 13.9 13.5 13.7 13.0 11.7 12.1 9.3 9.8 10.4

Table 1: Soil Vapor Point and Indoor/Outdoor Air Field Measurements ADT 1							
DSCA ID No	o.: 32-0013	3					
Sample ID	Depth [fteet bgs]	Sampling Date (mm/dd/yy)	Total Volatile Organic E Compounds (VOC)	% Methane	% Carbon Dioxide	% Oxygen	
		11/27/12	75.5	0.0	6.3	16.1	
SV-20S	5.00	01/08/13 02/07/13 03/08/13 04/08/13 05/08/13 06/13/13 08/15/13 09/11/13 10/09/13 11/13/13	15.0 NM NM 47.4 62.5 64.0 61.8 60.4 89.7 78.1	$ \begin{array}{c} 1.3 \\ 0.1 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.1 \\ 0.1 \\ 0.0 \\ \end{array} $	5.0 6.4 5.0 5.2 6.3 7.7 6.8 5.1 7.0 6.8	16.9 15.5 16.0 15.3 14.6 13.1 13.6 15.3 15.3 15.3 14.4	
SV-20D	20.00	01/08/13 02/07/13 03/08/13 04/08/13 05/08/13 06/13/13 08/15/13 09/11/13 10/09/13 11/13/13	11.10 NM 46.8 61.4 58.9 60.1 93.1 113 101	$\begin{array}{c} 0.4 \\ 0.1 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.1 \\ 0.1 \\ 0.0 \\ \end{array}$	7.6 6.7 6.8 6.7 5.8 7.1 6.6 7.6 8.8 8.2	15.2 15.6 14.9 15.2 15.1 13.5 14.1 12.5 13.4 12.8	
SV-29S	5.00	11/27/12 01/08/13 02/07/13 03/08/13 04/08/13 05/08/13 06/13/13 08/14/13 09/11/13 10/09/13 11/13/13	344 96.3 NM 235 151 197 317 268 356 294	$\begin{array}{c} 0.0 \\ 0.3 \\ 0.1 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.1 \\ 0.1 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ \end{array}$	1.9 2.0 2.3 2.8 2.6 3.3 3.6 3.4 2.2 3.2 2.8	19.9 19.8 18.6 17.6 17.2 16.7 16.2 17.7 17.6 18.0 17.8	
SV-55S	5.00	11/27/12 01/08/13 02/07/13 03/08/13 04/08/13 05/08/13 06/13/13 07/08/13 08/14/13 09/11/13 10/09/13 11/13/13	430 295 NM 311 290 295 258 133 229 501 444	$\begin{array}{c} 0.2 \\ 4.1 \\ 2.1 \\ 1.8 \\ 1.4 \\ 1.1 \\ 0.8 \\ 0.7 \\ 0.2 \\ 0.9 \\ 0.8 \\ 0.4 \\ \end{array}$	$\begin{array}{r} 0.2 \\ 3.0 \\ 2.8 \\ 3.1 \\ 3.0 \\ 3.9 \\ 4.5 \\ 4.9 \\ 1.8 \\ 5.5 \\ 5.4 \\ 4.8 \end{array}$	21.1 14.7 14.6 14.0 14.3 13.3 11.8 11.1 17.8 10.6 13.6 11.1	

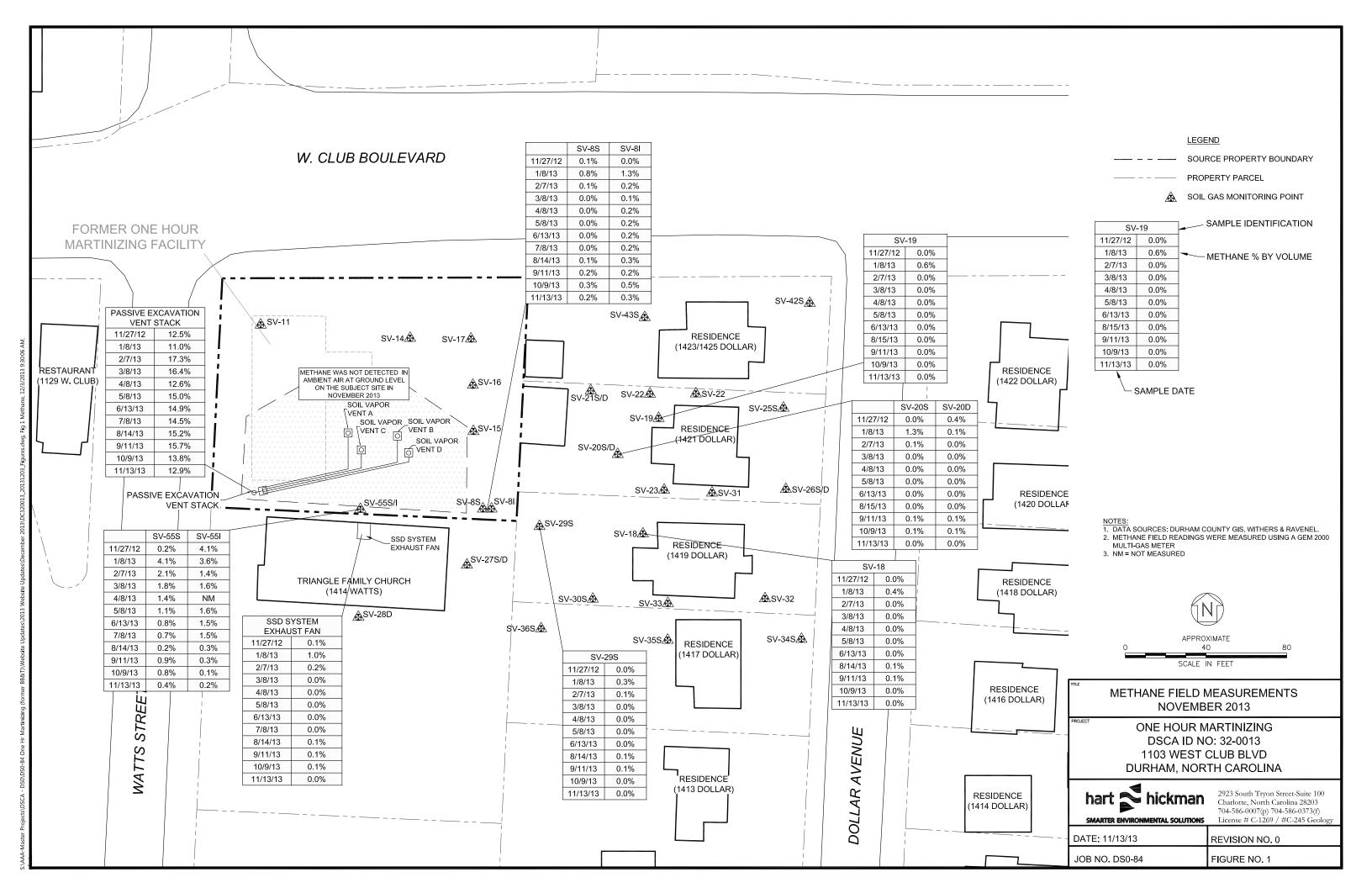
Table 1: Soil Vapor Point and Indoor/Outdoor Air Field Measurements ADT 1							
DSCA ID No	b.: 32-0013	3					
Sample ID	Depth [feet bgs]	Sampling Date (mm/dd/yy)	dd Total Volatile Organic E Compounds (VOC)	% Methane	% Carbon Dioxide	% Oxygen	
		11/27/12	12	4.1	0.6	12.4	
		01/08/13 02/07/13 03/08/13 04/08/13	442 NM NM	3.6 1.4 1.6 NI	2.0 2.9 3.5	12.1 14.8 14.6	
		04/08/13	NM	1.6	2.7	10.7	
SV-55I	17.00	06/13/13 07/08/13 08/14/13	86.5 NM 26.7	1.5 1.5 0.3	1.6 2.1 0.2	11.0 10.6 16.5	
		09/11/13	31.3	0.3	1.9	15.4	
		10/09/13	4.9	0.1	0.0	21.2	
		11/13/13	17.4	0.2	1.0	16.5	
		11/27/12	38.0	12.5	11.1	9.7	
		01/08/13 02/07/13	173 NM	11.0 17.3	9.3 15.9	10.6 1.5	
		02/07/13	NM	17.3	15.0	1.5	
		04/08/13	6.5	12.6	11.7	4.9	
Vent E	Exhaust	05/08/13	10.8	15.0	14.4	1.9	
Pi	pe	06/13/13	9.6	14.9	13.4	0.7	
		07/08/13	9.6	14.5	13.0	0.8	
		08/14/13	17.7	15.2	14.5	1.7	
		09/11/13 10/09/13	14.7	15.7	13.4	1.5	
		11/13/13	16.0 15.8	13.8 12.9	10.4 11.1	6.7 4.4	
		11/27/12	2.4	0.1	0.0	21.0	
		01/08/13	159	1.0	0.0	21.0	
		02/07/13	NM	0.2	0.0	21.4	
		03/08/13	NM	0.0	0.0	20.8	
		04/08/13	0.0	0.0	0.0	20.8	
	ystem	05/08/13	0.0	0.0	0.0	20.6	
	mily Church	06/13/13	0.0	0.0	0.0	20.4	
1414 Wa	tts Street	07/08/13	0.0	0.0	0.0	20.5	
		08/14/13	4.4	0.1	0.0	20.5	
		09/18/13	0.5	0.1	0.0	20.2	
		10/09/13	6.1	0.1	0.1	21.1	
		11/13/13	4.6	0.0	0.0	20.8	
		11/27/12	0.0	0.0	0.0	21.0	
		01/08/13	0.0	0.0	0.0	20.9	
		02/07/13	NM	0.0	0.0	20.8	
		03/08/13	NM	0.0	0.0	21.0	
		04/08/13	0.0	0.0	0.0	20.9	
	or Air	05/08/13	0.0	0.0	0.0	20.5	
-	mily Church tts Street	06/13/13	0.0	0.0	0.0	20.5	
1414 Wa	us sueet	07/08/13	0.0	0.0	0.0	20.5	
		08/14/13	0.0	0.1	0.0	20.6	
		09/18/13	0.0	0.0	0.0	20.3	
		10/09/13	0.0	0.1	0.0	21.2	
		11/13/13	0.0	0.0	0.0	20.8	

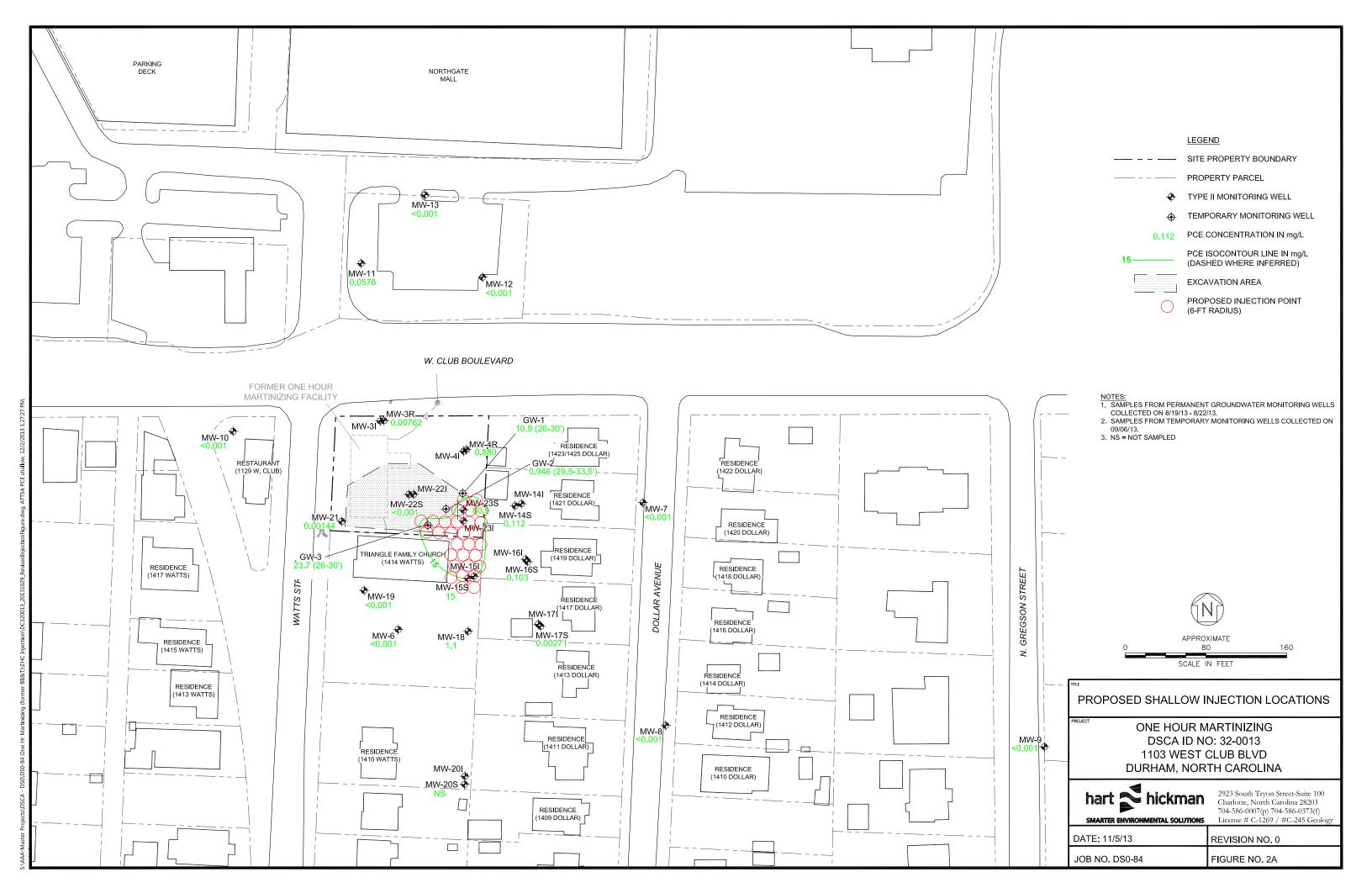
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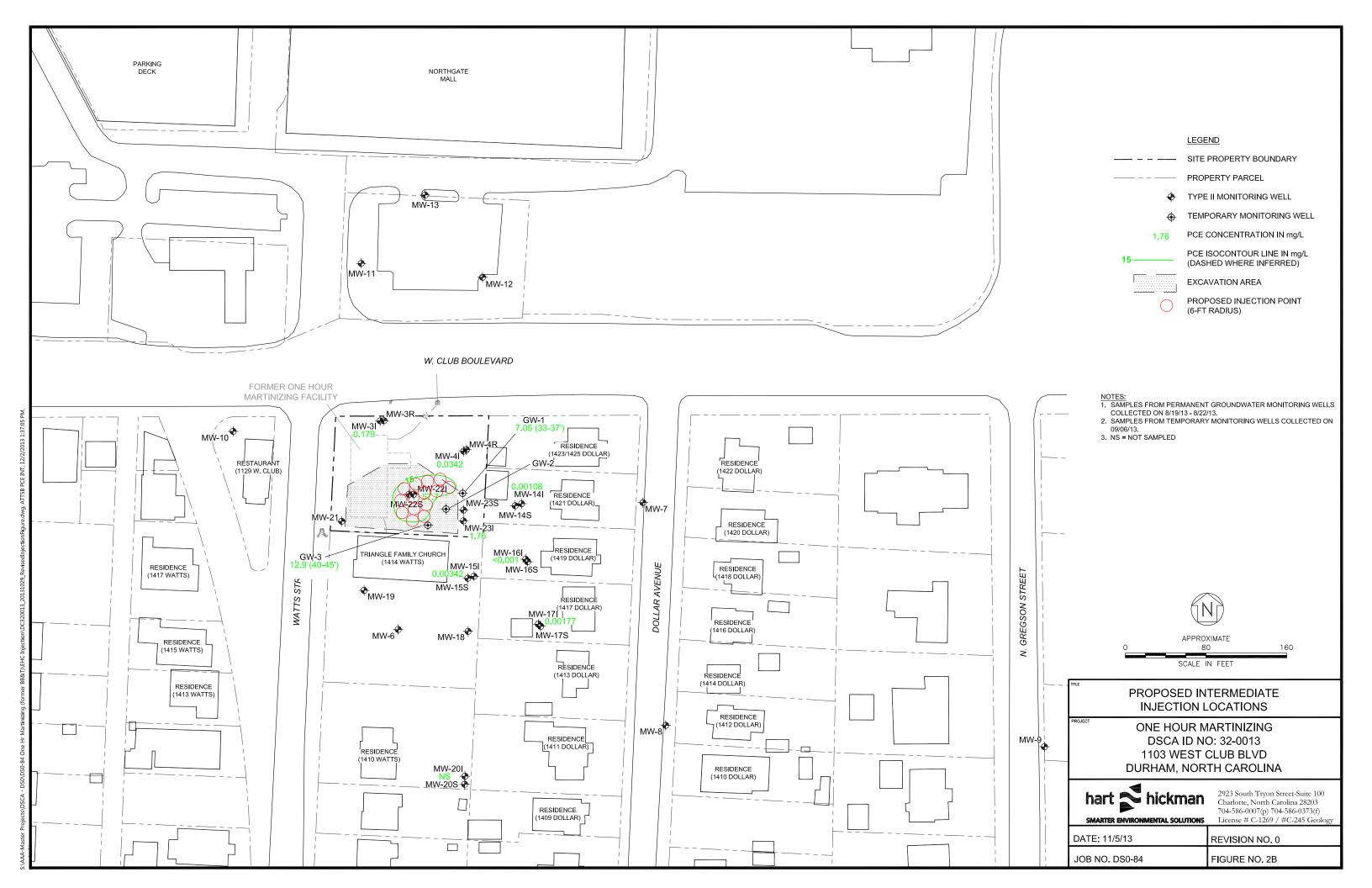
able 1: Soil SCA ID No						ADT 1
Sample ID	Depth [feet bgs]	Sampling Date (mm/dd/yy)	Total Volatile Organic Compounds (VOC)	Methane	Carbon Dioxide	Oxygen
San	Depth [feet b	Sarr	ppm	%	%	%
		11/27/12	0.0	0.0	0.0	20.9
		01/08/13	0.0	0.0	0.0	20.9
		02/07/13	NM	0.0	0.0	21.5
		03/08/13	NM	0.0	0.0	20.9
		04/08/13	0.0	0.0	0.0	20.9
Ambient, O		05/08/13	0.0	0.0	0.0	20.4
(near excava		06/13/13	0.0	0.0	0.0	20.4
subject site)		07/08/13	0.0	0.0	0.0	20.4
		08/14/13	0.0	0.0	0.0	20.6
		09/11/13	0.0	0.0	0.0	20.3
		10/09/13	0.0	0.3	0.0	21.3
		11/13/13	0.0	0.0	0.0	22.1

VOC concentrations measured using a photoionization detector (PID)
 Methane, carbon dioxide, and oxygen concentrations measured using GEM 2000 multi-gas meter.
 NM denotes not measured; NA denotes not available.

FIGURES







PROJECT CALENDAR

		~ D	ecember 201	3 ~				
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday		
1	2	3	4	5	6	7		
		14	-Day Radiello Indoo	r Air Sampling at 14	419 & 1421 Dollar A	ve		
				Public Information Session				
8	9	10	11	12	13	14		
	14	4-Day Radiello Indo	or Air Sampling at 1	419 & 1421 Dollar A	ve			
3-Hour Summa Canister Indoor Air Sampling at 1414 Watts St								
15	16	17	18	19	20	21		
14-Day Radiello	Indoor Air Samplin	ig at 1419 & 1421	Monthly Methane Field Screening					
		Pre–Injection G	oundwater and Soil	J Vapor Sampling				
						<u>.</u>		
22	23	24	25	26	27	28		
			Christmas Day					
29	30	31	Note: Schedule tentative and subject to change. Please check http://portal.ncdenr.org/web/wm/ dsca/bbt_updates regularly for any changes in the schedule.					

~ January 2014 ~									
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday			
Note: Schedule tentati portal.ncdenr.org/web/ he schedule.	ve and subject to change. /wm/dsca/bbt_updates reg	Please check http:// ularly for any changes in	1	2	3	4			
5	6	7	8 Methane Field Screening	9	10	11			
			Inject Adve	entus EHC					
12	13	14	15	16	17	18			
	Inject Ad	ventus EHC							
19	20	21	22	23	24	25			
26	27	28	29	30 Methane Field Screening	31				

		~ F	February 2014	4 ~			
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
Note: Schedule tentativ portal.ncdenr.org/web/ the schedule.	/e and subject to change. F wm/dsca/bbt_updates regu	Please check http:// llarly for any changes in				1	
2	3	4	5	6	7	8	
9	10	10 11	12	13 24-Hour Summa Canister Indoor Air Sampling at	14	15	
				1419 & 1421 Dollar Ave		liello Indoor Air 9 & 1421 Dollar Ave	
16	17	18	19	20	21	22	
3-Hour Summa		Post-Injection G	iroundwater and Soil	Vapor Sampling			
Canister Indoor Air Sampling at 1414 Watts St	Methane Field Screening						
		- 4-Day Radiello Indo	or Air Sampling at 14	419 & 1421 Dollar A	ve	•	
23	24	25	26	27	28	1	
1							

~ March 2014 ~									
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday			
2	3	4	5	6	7	8			
9	10	11	12	13 24-Hour Summa Canister Indoor Air Sampling at 1419 & 1421 Dollar Ave		15 Ilo Indoor Air & 1421 Dollar Ave			
16	17	18	19	20	21	22			
3-Hour Summa		Post-Injection G	roundwater and Soi	I Vapor Sampling					
Canister Indoor Air Sampling at 1414 Watts St	Methane Field Screening								
	. 14	-Day Radiello Indoo	or Air Sampling at 14	419 & 1421 Dollar A	ve				
23	24	25	26	27	28	29			
14	-Day Radiello Indo	or Air Sampling at 1	419 & 1421 Dollar A	ve					
					1				
30	31	Note: Schedule tentative for any changes in the s	and subject to change. P chedule.	lease check http://portal.n	cdenr.org/web/wm/dsca/ł	obt_updates regularly			

~ April 2014 ~								
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday		
		1	2	3	4	5		
6	7	8	9 10 24-Hour Summa Canister Indoor Air Sampling at	24-Hour Summa Canister Indoor	11	12		
				Dollar Ave	14-Day Radie Sampling at 1419	ello Indoor Air & 1421 Dollar Ave		
13	14	15	16	17	18	19		
3-Hour Summa Canister Indoor		Post-Injection G	roundwater and Soi	I Vapor Sampling				
Air Sampling at 1414 Watts St	Methane Field Screening							
	14	-Day Radiello Indoo	or Air Sampling at 1	419 & 1421 Dollar A	ve			
20	21	22	23	24	25	26		
14	- I-Day Radiello Indo	or Air Sampling at 1	419 & 1421 Dollar A	ve				
27	28	29	30	Note: Schedule tentative and subject to change. Please check http:// portal.ncdenr.org/web/wm/dsca/bbt_updates regularly for any changes in the schedule.				