TETRA TECH

PHIL-22373

September 3, 2008

Project Number 01060

Mr. Romuald Roman (3HS22)
U.S. Environmental Protection Agency (EPA) Region 3
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Reference: Remedial Action Contract - EPA Region 3
EPA Contract No. EP-S3-07-04

Subject: Round 2 Residential Vapor Intrusion Study Letter Report
Butz Landfill Site
Long-Term Remedial Action (LTRA)
EPA Work Assignment No. 021-RALR-03Q6

Dear Mr. Roman:

Based on comments from the EPA Region 3 Toxicologist (USEPA Region 3, 2008), Tetra Tech NUS, Inc. (Tetra Tech) was tasked by Environmental Protection Agency (EPA) Region 3 to further investigate three residences (i.e., R01, R06, and R07B) that were shown to contain elevated contaminant concentrations (i.e., TCE) during the Round 1 Vapor Intrusion (VI) Investigation (Tetra Tech, 2008). The Round 2 VI Investigation sample locations are shown on Figure 1. In addition to re-collecting sub-slab soil vapor (SV), indoor air (IA), outdoor ambient air (OA), and sump water (SUMP) samples, shallow groundwater (GW) sampling was conducted at two of these residences as described in July 2007 Work Plan Addendum for the Vapor Intrusion Investigation (Tetra Tech, 2007). During the field investigation that was conducted on May 7 and 8, 2008, Tetra Tech collected the samples listed in Table 1 from the three homes.

The Round 2 VI data were compared to the following screening criteria: Oak Ridge National Laboratory (ORNL) Regional Screening Levels for Residential Air (ORNL, July 2008) and EPA Region 3 Risk Based Concentrations (RBCs) for Ambient Air (USEPA Region 3, October 2007). Since disbursement of the Round 1 VI Study Report was prepared, the EPA Region 3 RBCs have been superseded by the ORNL Regional Screening Levels. This Round 2 VI Study Report compares data to both screening values, which are listed in Table 2. The EPA Region 3 RBCs are more stringent than the ORNL Regional Screening Levels with the following exceptions: 1,1-DCE, 1,1,1-TCA, and ethyl benzene.

The sample results for air sampling are included as Table 3 and 4, and the sample results for aqueous sampling are included as Table 5. Unadjusted SV, IA, and OA sample result concentrations were compared to EPA Region 3 RBCs for ambient air screening levels in Table 3 and ORNL Regional Screening levels for Residential Air in Table 4. Exceedances of each screening criteria are provided on the respective table. SUMP and GW samples were compared to MCLs (USEPA, 2006).

The analytical results from each residence are discussed in the following sections. The Round 2 VI results are also compared to the Round 1 VI results as appropriate.

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Residence R01

Two indoor air samples were obtained at this home. Indoor air samples collected from the 1st floor of R01 indicated elevated levels of 1,3-butadiene (0.30 µg/m^3) and chloroform (3.9 µg/m^3) in excess of the Region 3 RBCs for ambient air screening levels. PCE, TCE and chloroform were detected in sub-slab vapor samples in excess of Region 3 RBCs. Indoor air samples did not contain PCE or TCE. Elevated levels of BTEX (benzene, toluene, ethylbenzene, and xylene) compounds in the basement indoor air sample can be attributed to recent latex painting in the basement as well as other possible yet unidentified sub-slab vapor sources.

The shallow groundwater sample from R01 indicated the presence of TCE (31+ µg/L) and cis-1,2-DCE (8.2 µg/L). TCE was detected in excess of the MCL. The shallow groundwater sample was obtained from a screened depth of 5 feet to 15 feet below ground surface (bgs). Groundwater was encountered at 15 feet bgs. The sump water sample contained low concentrations of toluene (0.50 µg/L) and m,p-xylene (0.38 µg/L), which were both J qualified.

The presence of TCE in shallow groundwater and sub-slab vapor samples indicates that the vapor intrusion pathway may pose a problem. The VOC detections from the Round 2 VI investigation sub-slab vapor samples are an order of magnitude higher than the Round 1 results. The sub-slab sample locations during the Round 2 VI investigation were different than those from Round 1. Currently, however, the vapor intrusion pathway is incomplete since TCE was not detected in the indoor air samples. Further monitoring of indoor air should be considered in conjunction with the five-year sampling events. The outdoor air sample obtained at this home did not contain any site-related contaminants.

Residence R06

Two indoor air samples were obtained at this home. Indoor air samples collected from the basement of R06 indicated elevated levels of 1,3-butadiene (0.63 µg/m^3) and x,p-xylene (110 µg/m^3) in excess of the Region 3 RBCs for ambient air screening levels. PCE, TCE, chloroform, and 1,1,2,2-TCA were detected in sub-slab vapor samples in excess of Region 3 RBCs. Indoor air samples did not contain detections of PCE or TCE. Elevated levels of BTEX compounds in the basement indoor air sample can be attributed to woodworking paints and stains as well as other possible yet unidentified sub-slab vapor sources.

The shallow groundwater sample from R06 did not indicate the presence of VOCs. The shallow groundwater sample was obtained from a screened depth of 24.5 feet to 29.5 feet below ground surface (bgs). Groundwater was encountered at 29.5 feet bgs.

The lack of VOC detections in shallow groundwater indicates that the source of sub-slab vapor contaminant detections may be unrelated to the site. The Round 2 VI investigation VOC detections in the sub-slab vapor samples are comparable to the Round 1 VI investigations results. Moreover, since TCE and PCE were not detected in indoor air samples, the vapor intrusion pathway does not appear to be affecting this residence. The outdoor air sample obtained at this home did not contain any site-related contaminants with the exception of a trace amount of toluene (0.77 µg/m^3).

Residence R07B

Three indoor air samples were obtained at this home. Indoor air samples collected from the 1st floor of R07B indicated elevated levels of 1,3-butadiene (3.2 µg/m^3) and 1,2-DCA (1.1 µg/m^3) in excess of the Region 3 RBCs for ambient air screening levels. 1,3-butadiene and 1,2-DCA were also detected in the 2nd floor sample at elevated concentrations (3.9 µg/m^3 and 0.97 µg/m^3, respectively). Chloroform was detected at an elevated concentration in the basement indoor air sample. PCE (1.4 µg/m^3 maximum) and TCE (38 µg/m^3 maximum) were detected in sub-slab vapor samples in excess of Region 3 RBCs. Indoor

air samples did not contain detections of PCE or TCE. Elevated levels of BTEX compounds in the indoor air sample are probably not attributable to the site. The 1,3-butadiene detected in indoor air samples could be attributed to smoking by the residents of R07B since 1,3-butadiene was not detected in the sub-slab vapor samples during Rounds 1 and 2. Indoor and outdoor air samples were not collected during the Round 1 VI investigation.

A shallow groundwater sample was not collected at R07B because groundwater was not encountered prior to reaching bedrock at 4 different locations around the residence. At each location, bedrock was encountered between 6 feet and 10 feet bgs.

The presence of TCE and PCE in sub-slab vapor samples indicates that the vapor intrusion pathway may pose a problem. Currently, however, the vapor intrusion pathway is incomplete since TCE and PCE were not detected in indoor air samples. The concentrations of TCE and PCE found during the Round 2 were twice as high as the concentrations in Round 1. The concentrations for BTEX compounds were comparable for both rounds. Further monitoring of indoor air should be considered in conjunction with the five-year sampling events. The outdoor air sample obtained at this home did not contain any site-related contaminants.

Sampling Abnormalities

Problems with the duplicate samples (DUP-01 and DUP-02) were encountered after sampling. The DUP-01 and R06-SV5 sample pair contain differences in concentrations because the sample canister for R06-SV5 lost pressure after sampling. As the canister for R06-SV5 was disconnected from the sampling apparatus, the canister valve was apparently not fully closed and the canister was vented to the atmosphere. Tetra Tech expects that the concentrations reported by the DUP-01 sample are representative of the sample location; the R06-SV5 sample results should be discounted.

The DUP-02 and R07B-SV2 sample pair contain differences in concentrations because the sample canister for DUP-02 lost pressure during transit from the laboratory to Tetra Tech. Tetra Tech expects that the concentrations reported by the R07B-SV2 sample are representative of the sample location; the DUP-02 sample results should be discounted.

Please contact me if you have any questions or comments.

Sincerely,

Neil Teamerson

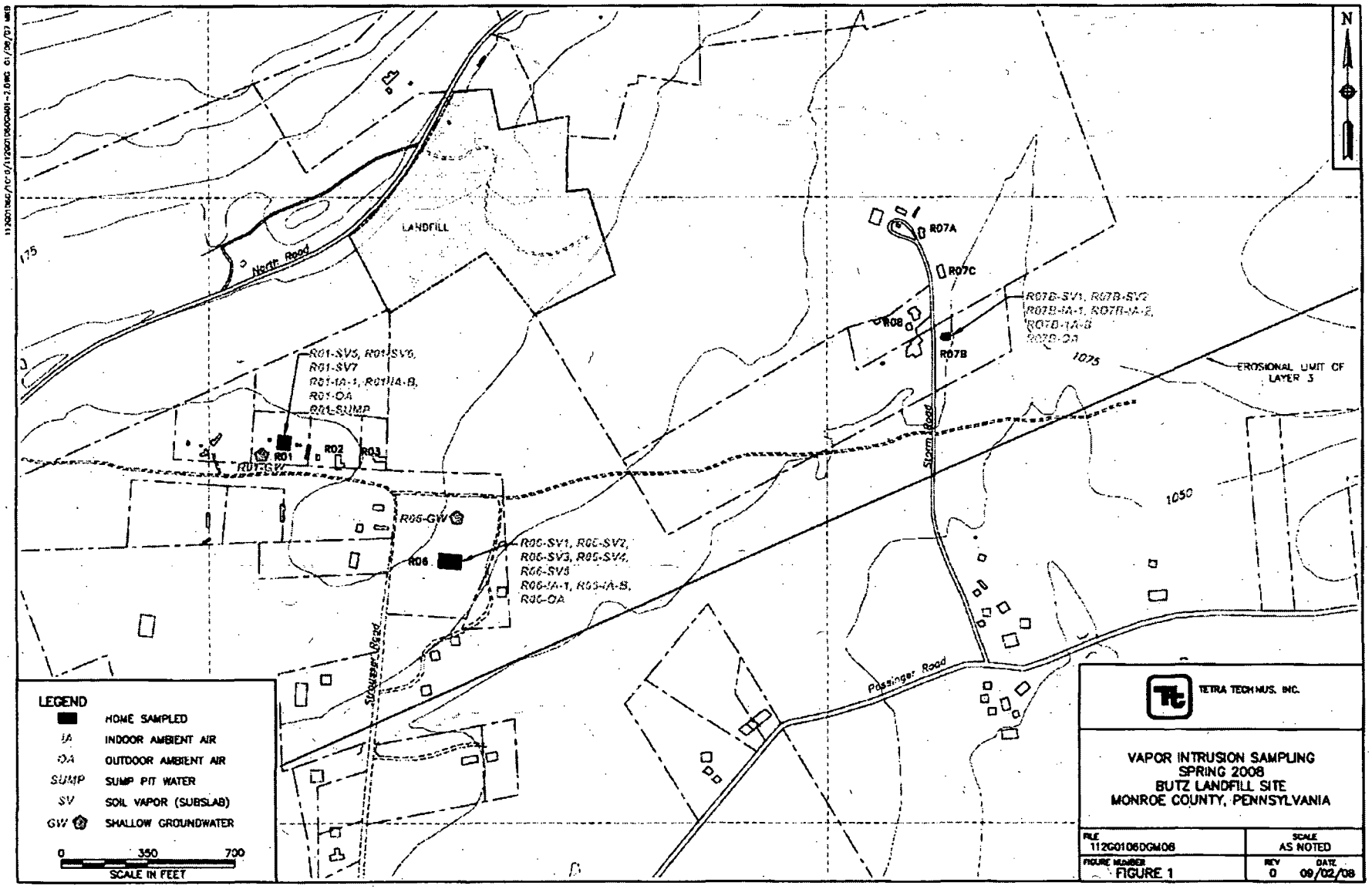
Neil Teamerson
Project Manager

NT/nfs

Enclosures

c: Bruce Rundell (EPA Region 3)
Elaine Spiewak (EPA Region 3) (without enclosures)
Gordon Araujo (Tetra Tech)
File No. 3

FIGURES


N
LANDFILL
North Road
1075
R07A
R07C
R08
R07B
R07B-SV1, R07B-SV2
R07B-IA-1, R07B-IA-2,
R07B-1A-3
R07B-OA
EROSIONAL LIMIT OF LAYER 3
Storm Road
R01-SV5, R01-SV6,
R01-SV7
R01-IA-1, R01-IA-B,
R01-OA
R01-SUMP
R01
R02
R03
R01-GW
R06-GW
R06
R06-SV1, R06-SV2,
R06-SV3, R06-SV4,
R06-SV5
R06-IA-1, R06-IA-B,
R06-OA
1050
Stoney Road
Passinger Road
LEGEND
HOME SAMPLED
IA INDOOR AMBIENT AIR
OA OUTDOOR AMBIENT AIR
SUMP SUMP PIT WATER
SV SOIL VAPOR (SUBSLAB)
GW SHALLOW GROUNDWATER
0 350 700
SCALE IN FEET
TETRA TECH NUS, INC.
VAPOR INTRUSION SAMPLING
SPRING 2008
BUTZ LANDFILL SITE
MONROE COUNTY, PENNSYLVANIA
FILE 112G01060GM08
SCALE AS NOTED
FIGURE NUMBER FIGURE 1
REV 0
DATE 09/02/08

TABLES

TABLE 1
SUMMARY OF ROUND 2 VI SAMPLE TYPES
VAPOR INTRUSION INVESTIGATION – ROUND 2
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA

Residence	Indoor Air	Outdoor Air	Sub-slab Soil Vapor	Sump Water	Shallow Groundwater
R01	1st Floor; Basement	1	3	1	1
R06	1st Floor; Basement	1	5 + Duplicate	0	1
R07B	2nd Floor; 1st Floor; Basement	1	2 + Duplicate	0	0

TABLE 2
COMPARISON OF SCREENING CRITERIA

Volatile Compound	Regional Screening Levels for Residential Air (ORNL, 2008)		EPA Region 3 Risk Based Concentrations (RBCs) for Ambient Air (USEPA, 2007)	
	µg/m³		µg/m³	
Vinyl Chloride	0.16	C	0.072	C
1,3-Butadiene	0.081	C	0.063	C
Trichlorofluoromethane (F11)	730	N	730	N
1,1-Dichloroethene	210	N	219	N
trans-1,2-Dichloroethene	63	N	62.05	N
cis-1,2-Dichloroethene	63*	N	36.5	N
Chloroform	0.11	C	0.077	C
1,1,1-Trichloroethane	5,200	N	5,220	N
Carbon Tetrachloride	0.18	C	0.118	C
1,2-Dichloroethane	0.094	C	0.069	C
Trichloroethene	1.2	C	0.016	C
Toluene	5,200	N	5,110	N
Tetrachloroethene	0.41	C	0.313	C
Ethyl Benzene	0.97	C	1,059	N
m,p-Xylene	730	N	109.5	N
o-Xylene	730	N	109.5	N
1,1,2,2,-Tetrachloroethane	0.042	C	0.031	C

Notes:
C Basis: Carcinogenic effects
N Basis: Non-carcinogenic effects
* Trans-1,2-DCE screening level utilized because cis-1,2-DCE screening level not listed.
More stringent criteria.

TABLE 3
ROUND 2 DATA SUMMARY FOR VOLATILE ORGANIC COMPOUND AIR RESULTS COMPARED TO EPA REGION 3 RBCs FOR AMBIENT AIR
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 1 OF 3

Sample Number / Field QC Date Sampled Time Sampled Dilution Factor		EPA Region 3 Risk Based Concentrations (RBCs) for Ambient Air (USEPA, 2007)		R01-IA-1-20080507 5/07/2008 16:53 1.36	R01-IA-6-20080507 5/07/2008 16:30 1.55	R01-OA-20080507 5/07/2008 16:34 1.64	R01-SV5-20080507 5/07/2008 17:43 1.46	R01-SV6-20080507 5/07/2008 17:37 1.45	R01-SV7-20080507 5/07/2008 17:31 1.42
Volatile Compound	RL	µg/m³		µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Vinyl Chloride	0.26	0.072	C						
1,3-Butadiene	0.22	0.063	C	0.30					
Trichlorofluoromethane (F-11)	0.56	730	N	1.5	1.5	1.4	2.6	2.3	2.2
1,1-Dichloroethene	0.40	219	N						
trans-1,2-Dichloroethene	0.40	62.05	N						
cis-1,2-Dichloroethene	0.40	36.5	N						
Chloroform	0.49	0.077	C	3.0	0.81			8.4	
1,1,1-Trichloroethane	0.54	5,220	N						
Carbon Tetrachloride	0.63	0.118	C						
1,2-Dichloroethane	0.40	0.069	C						
Trichloroethene	0.54	0.016	C				2.0	6.0	6.0
Toluene	0.38	5,110	N	5.3	64		7.7	14	15
Tetrachloroethene	0.68	0.314	C				18	24	10
Ethyl Benzene	0.43	1,059	N	0.84	15		1.0	2.2	2.5
m,p-Xylene	0.43	106.5	N	2.8	45		3.3	5.9	8.8
o-Xylene	0.43	109.5	N	1.2	27		2.1	3.7	3.6
1,1,2,2-Tetrachloroethane	0.69	0.011	C						

Notes:
[shaded] Analyte exceeds EPA Region 3 RBC for Ambient Air
C Basis: Carcinogenic effects
N Basis: Noncarcinogenic effects
RL Reporting Limit

Sample Number Field QC Date Sampled Time Sampled Dilution Factor		EPA Region 3 Risk-Based Concentrations (RBCs) for Ambient Air (USEPA, 2007)		R06-IA-1-20080507 5/07/2008 16:42 1.36	R06-IA-B-20080507 5/07/2008 16:05 1.81	R06-OA-20080507 5/07/2008 17:01 1.81	R06-SV1-20080507 5/07/2008 14:10 1.44	R06-SV2-20080507 5/07/2008 14:27 1.46	R06-SV3-20080507 5/07/2008 14:45 1.94	R06-SV4-20080507 5/07/2008 14:25 1.55	R06-SV5-20080507 Field Dup of DUP-01-20080507 5/07/2008 14:40 1.34	DUP-01-20080507 Field Dup of R06-SV5-20080507 5/08/2008 13:14 3.83
Volatile Compound	RL	µg/m³		µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Vinyl Chloride	0.26	0.072	C									
1,3-Butadiene	0.22	0.063	C		0.83				0.83			
Trichlorofluoromethane (F-11)	0.56	730	N	3.0	19	1.6	9.7	8.7	16	14	11	11
1,1-Dichloroethane	0.40	219	N									
trans-1,2-Dichloroethene	0.40	62.05	N									
cis-1,2-Dichloroethene	0.40	36.5	N									
Chloroform	0.49	0.077	C									3.0
1,1,1-Trichloroethane	0.54	5,220	N									
Carbon Tetrachloride	0.63	0.118	C									
1,2-Dichloroethane	0.40	0.069	C									
Trichloroethene	0.54	0.016	C					1.0			0.88	38
Toluene	0.38	5,110	N	6.6	190	0.77	17	28	200	18	38	340
Tetrachloroethene	0.68	0.313	C				1.2	1.5	8.0	1.2	1.8	
Ethylbenzene	0.43	1,059	N	1.2	20		2.8	3.6	6.3	7.5	4.2	3.7
m,p-Xylene	0.43	109.5	N	3.6	110		7.7	11	24	8.0	16	10
o-Xylene	0.43	109.5	N	1.3	38		4.1	5.9	9.0	4.4	5.3	5.0
1,1,2,2-Tetrachloroethane	0.69	0.031	C				1.1					

Notes:

(shaded) Analyte exceeds EPA Region 3 RBC for Ambient Air

C Basis: Carcinogenic effects

N Basis: Noncarcinogenic effects

RL Reporting Limit

TABLE 3
ROUND 2 DATA SUMMARY FOR VOLATILE ORGANIC COMPOUND AIR RESULTS COMPARED TO EPA REGION 3 RBCs FOR AMBIENT AIR
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 3 OF 3

Sample Number Field QC Date Sampled Time Sampled Dilution Factor		EPA Region 3 Risk Based Concentrations (RBCs) for Ambient Air (USEPA, 2007)		R07B-IA-1-20080508 5/08/2008 18:45 1.58	R07B-IA-2-20080508 5/08/2008 18:43 1.58	R07B-IA-B-20080508 5/08/2008 18:20 1.58	R07B-OA-20080508 5/08/2008 18:27 1.61	R07B-SV1-20080508 5/08/2008 17:25 1.44	R07B-SV2-20080508 Field Dup. of DUP-02-20080508 5/08/2008 17:56 1.44	DUP-02-20080508 Field Dup. of R07B-SV2-20080508 5/08/2008 14:33 1.36
Volatile Compound	RL	µg/m³		µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Vinyl Chloride	0.26	0.072	C							
1,3-Butadiene	0.22	0.063	C	**3.2**	**3.9**	**0.46**				
Trichlorofluoromethane (F-11)	0.56	730	N	1.5	1.6	1.7	1.5	1.4	1.5	1.7
1,1-Dichloroethane	0.40	216	N							
trans-1,2-Dichloroethene	0.40	62.05	N							
cis-1,2-Dichloroethene	0.40	36.5	N							
Chloroform	0.49	0.077	C			**1.9**				
1,1,1-Trichloroethane	0.54	5,220	N							
Carbon Tetrachloride	0.63	0.114	C							
1,2-Dichloroethane	0.40	0.064	C	**21.1**	**0.97**					
Trichloroethene	0.54	0.016	C					**6.0**	**30**	**10**
Toluene	0.38	5,110	N	6.6	7.8	3.1		15	26	76
Tetrachloroethene	0.68	0.312	C					**1.8**	**4.3**	**1.4**
Ethyl Benzene	0.43	1,120	N	0.67	1.0			1.6	1.3	2.3
m,p-Xylene	0.43	109.5	N	2.6	3.2	2.0		4.7	4.4	6.4
o-Xylene	0.43	109.5	N	0.86	0.94	0.87		2.5	2.0	3.3
1,1,2,2-Tetrachloroethane	0.69	0.031	C							

Notes
[shaded] Analyte exceeds EPA Region 3 RBC for Ambient Air
C Basis: Carcinogenic effects
N Basis: Noncarcinogenic effects
RL Reporting Limit

TABLE 4
ROUND 2 DATA SUMMARY FOR VOLATILE ORGANIC COMPOUND AIR RESULTS COMPARED TO REGIONAL SCREENING LEVELS FOR RESIDENTIAL AIR
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA
PAGE 1 OF 3

Sample Number Field QC Date Sampled Time Sampled Dilution Factor			Regional Screening Levels for Residential Air (OEHHA, 2008)		RB1-IA-1-20080507 5/07/2008 10:53 1.65	RB1-IA-B-20080507 5/07/2008 10:30 1.55	RB1-OA-20080507 5/07/2008 10:34 1.64	RB1-SV3-20080507 5/07/2008 12:43 1.46	RB1-SV6-20080507 5/07/2008 12:37 1.49	RB1-SV7-20080507 5/07/2008 12:31 1.63
Volatile Compound	RL	µg/m³			µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Vinyl Chloride	0.26	0.16	C							
1,3-Butadiene	0.22	0.091	C	0.30						
Dichlorodifluoromethane (CFC 12)	0.50	0.073	C	1.5	1.5	1.4	2.0	2.3	2.2	
1,1-Dichloroethane	0.40	210	N							
trans-1,2-Dichloroethene	0.40	63	N							
cis-1,2-Dichloroethene	0.40	63 *	N							
Chloroform	0.49	0.11	C	0.8	0.81			0.4		
1,1,1-Trichloroethane	0.54	5,200	N							
Carbon Tetrachloride	0.63	0.16	C							
1,2-Dichloroethane	0.40	0.094	C							
Trichloroethene	0.54	1.2	C				6.0	6.0	6.0	
Toluene	0.38	5,200	N	5.3	84		7.7	14	15	
Tetrachloroethene	0.68	0.41	C				1.2	2.4	1.0	
Ethylbenzene	0.43	0.97	C	0.84	15		1.0	2.2	2.2	
m,p-Xylene	0.43	730	N	2.6	45		3.3	5.8	6.8	
o-Xylene	0.43	700	N	1.7	22		2.1	3.7	3.6	
1,1,2,2-Tetrachloroethane	0.69	0.042	C							

Notes:
- Analyte exceeds EPA Screening Level for Residential Air
- C Basis: Carcinogenic effects
- N Basis: Noncarcinogenic effects
- RL Reporting Limit
- * trans-1,2-DCE screening level listed.

TABLE 4
ROUND 2 DATA SUMMARY FOR VOLATILE ORGANIC COMPOUND AIR RESULTS COMPARED TO REGIONAL SCREENING LEVELS FOR RESIDENTIAL AIR
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA

Sample Number		Regional Screening Levels for Residential Air (OSWER, 2008)		R06-IA-1-20080507	R06-IA-2-20080507	R06-OA-20080507	R06-SV1-20080507	R06-SV2-20080507	R06-SV3-20080507	R06-SV4-20080507	R06-SV5-20080507	DUP-01-20080507
Field QC											Field Dup. of DUP-01-20080507	Field Dup. of R06-SV5-20080507
Date Sampled				5/07/2008	5/07/2008	5/07/2008	5/07/2008	5/07/2008	5/07/2008	5/07/2008	5/07/2008	5/08/2008
Time Sampled				16:42	18:05	17:01	14:10	14:27	14:45	14:25	14:40	13:14
Dilution Factor				1.36	1.61	1.83	1.44	1.46	1.94	1.55	1.34	3.83
Volatile Compound	RL	µg/m³		µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Vinyl Chloride	0.26	0.16	C									
1,3-Butadiene	0.22	0.081	C		**0.63**				**0.63**			
Trichlorofluoromethane (F-11)	0.56	0.073	C	**3.0**	**19**	**1.6**	**8.7**	**8.7**	**19**	**14**	**11**	**41**
1,1-Dichloroethene	0.40	210	N									
trans-1,2-Dichloroethene	0.40	63	N									
cis-1,2-Dichloroethene	0.40	63 *	N									
Chloroform	0.49	0.11	C									**3.0**
1,1,1-Trichloroethane	0.54	5,200	N									
Carbon Tetrachloride	0.63	0.16	C									
1,2-Dichloroethane	0.40	0.094	C									
Trichloroethene	0.54	1.2	C					1.0			0.86	**20**
Toluene	0.38	5,200	N	6.6	190	0.77	17	28	200	18	36	340
Tetrachloroethene	0.68	0.41	C				**1.2**	**1.0**	**3.0**	**1.2**	**1.9**	
Ethyl Benzene	0.43	0.97	C	**1.2**	**28**		**2.9**	**3.6**	**6.3**	**2.5**	**4.2**	**3.7**
m,p-Xylene	0.43	730	N	3.6	**110**		7.7	11	24	8.0	16	16
o-Xylene	0.43	730	N	1.3	36		4.1	3.0	8.0	4.4	5.3	5.0
1,1,2,2-Tetrachloroethane	0.69	0.042	C				**1.1**					

Notes
1.2 Analyte exceeds EPA Screening Level for Residential Air
C Basis: Carcinogenic effects
N Basis: Noncarcinogenic effects
RL Reporting Limit
* trans-1,2 DCE screening level listed

TABLE 4
ROUND 2 DATA SUMMARY FOR VOLATILE ORGANIC COMPOUND AIR RESULTS COMPARED TO REGIONAL SCREENING LEVELS FOR RESIDENTIAL AIR
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA

Sample Number Field ID Date Sampled Time Sampled Dilution Factor		Regional Screening Levels for Residential Air (RSL, 2008)		RD7B-IA-1-20080508 5/08/2008 10 45 1 58	RD7B-IA-2-20080508 5/08/2008 18 43 1 58	RD7B-IA-3-20080508 5/08/2008 18 20 1 56	RD7B-GA-20080508 5/08/2008 18 27 1 61	RD7B-SV1-20080508 5/08/2008 17 25 1 44	RD7B-SV2-20080508 Field Dup of DUP-02-20080508 5/08/2008 17 50 1 44	DUP-02-20080508 Field Dup of RD7B-SV2-20080508 5/08/2008 14 53 1 36
Volatile Compounds	RL	µg/m³		µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³
Vinyl Chloride	0 26	0 16	C							
1 3 Butadiene	0 22	0 041	C	0 2	3 9	0 68				
Trichlorofluoromethane (F11)	0 56	0 073	C	1 8	1 6	1 7	1 8	1 4	1 5	1 7
1,1 Dichloroethene	0 40	210	N							
trans 1 2 Dichloroethene	0 40	63	N							
cis 1 2 Dichloroethene	0 40	63	N							
Chloroform	0 49	0 11	C			1 6				
1,1,1 Trichloroethane	0 54	5 200	N							
Carbon Tetrachloride	0 63	0 16	C							
1 2 Dichloroethane	0 40	0 043	C	1 1	0 87					
Trichloroethene	0 54	1 2	C					0 6	38	78
Toluene	0 38	5 200	N	9 8	7 8	3 1		16	20	78
Tetrachloroethene	0 68	0 41	C					1 3	1 2	1 4
Ethyl Benzene	0 43	0 97	C	0 87	1 0			1 6	1 5	2 3
m p Xylene	0 43	730	N	2 8	3 5	2 0		4 7	4 4	6 4
o Xylene	0 43	730	N	0 86	0 94	0 67		2 5	2 0	3 5
1,1,2,2 Tetrachloroethane	0 69	0 042	C							

Notes:

Analyte exceeds EPA Screening Level for Residential Air

C Basis: Carcinogenic effects

N Basis: Noncarcinogenic effects

RL Reporting Limit

* trans-1 2 DCE screening level listed

TABLE 5
ROUND 2 DATA SUMMARY FOR VOLATILE ORGANIC COMPOUND AQUEOUS RESULTS COMPARED TO MCLs
BUTZ LANDFILL SITE
JACKSON TOWNSHIP, PENNSYLVANIA

Sampling Location : Date Sampled : Time Sampled : Dilution Factor :		Maximum Contaminant Level (MCL)[1]	R01-SUMP-20080507 5/7/2008 17:55 1.0	R01-GW-20080508 5/8/2008 13:45 1.0 / 2.0	R06-GW-20080508 5/8/2008 11:55 1.0
Trace Volatile Compound	CRQL	µg/L	µg/L	µg/L	µg/L
Acetone	5.0	---[2]	71 L	R	R
cis-1,2-Dichloroethene	0.50	70		8.2	
2-Butanone	5.0	---[2]	39		
Trichloroethene	0.50	5	0.46 B	31 +	
Toluene	0.50	1,000	0.50 J		
m,p-Xylene	0.50	10,000	0.38 J		

Notes:

(1) As presented in the U.S. EPA document "2006 Edition of the Drinking Water Standards and Health Advisories" (USEPA, 2006)

(2) No MCL given.

CRQL Contract Required Quantitation Limit

* Action Level Exists

Analyte exceeds MCL

Data Qualifier

B Not detected substantially above the level reported in laboratory or field blanks.

J Analyte present. Reported value may not be accurate or precise.

L Analyte present. Reported value may be biased low. Actual value is expected to be higher.

R Unusable result. Analyte may or may not be present in sample. Supporting data necessary to confirm result.

+ Result reported from the diluted analysis.

ATTACHMENT 1

SOIL VAPOR SAMPLE LOG SHEETS

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location:

Sample ID Number: R06-SV5-20080507
Sampled By: Gordon Araujo
Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: R06-SV5
Basement: (yes) / no
Room size (ft x ft): 27' x 27'
Floor material: (concrete) / wood / dirt / other
Slab Thickness (ft): 6 in
Visible Cracks: (yes) / no — expansion joints
Subslab Material: dirt / (gravel)

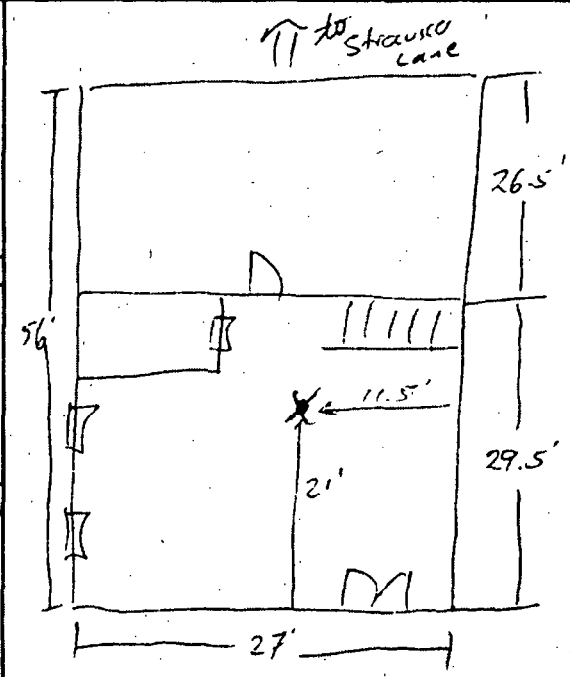
Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date: 5/7/08
Method: n/a
Diameter: 3/8 inch
Depth: 6 in
Packing Material: n/a
Initial PID Reading: 5.6, 0.0, 0.0
Post PID Reading: 0.0

LOCATION SKETCH



PURGE

Date: 5/7/08
Time: 1320
Rate: 1 L/min
Volume: 2 L

SAMPLE COLLECTION

Start Time: 1326 End Time: 1440
Starting Pressure: 29 PSI End Pressure: 0 psi
Rate: 111 mL/min
Volume:
Canister Descripti: 6 L Summa

OBSERVATIONS / NOTES:

Tank # 13856 - 29 PSI
Tank lost pressure upon removal for plumbing. Duplicate Tank OK no loss of Pressure

Dupl. cate Information
DUP-01-20080507 ; Tank # 4114 +28 PSI

Signature(s):

Assigned Time 1200

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location:

Sample ID Number: R07B-SV2-20080508
Sampled By: Carlos Araujo
Chuck Mayer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: R07B
Basement: (yes) no
Room size (ftxft):
Floor material: (concrete) / wood / dirt / other
Slab Thickness (ft): 4.4
Visible Cracks: (yes) no
Subslab Material: dirt (gravel)

Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date: 5/8/08
Method: n/a
Diameter: 3/8 inch
Depth: 6in
Packing Material: n/a
Initial PID Reading: 0.0
Post PID Reading:

LOCATION SKETCH

PURGE

Date: 5/8/08
Time: 1605
Rate: 1 L/min
Volume: 2 L

SAMPLE COLLECTION

Start Time: 1614 End Time: 1756
Starting Pressure: -30 End Pressure: 3.5 psi
Rate: 111 mL/min
Volume:
Canister Descripti: 6 L Summa

OBSERVATIONS / NOTES:

Tank # 31146

Duplicate Sample DUP-02-20080508
Start Pressure -18 psi
End Pressure 0 psi
Can # 10773 Assigned time 1256

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location: ___

Sample ID Number: R01-OA-20080507
Sampled By: Gordon Acuna
Charlie Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: ___
Basement: yes / no
Room size (ftxft): ___
Floor material: concrete / wood / dirt / other
Slab Thickness (ft): ___
Visible Cracks: yes / no
Subslab Material: dirt / gravel

Outdoor

Location: R01
Depth to Water (ft): ___
Soil type: ___
Odor: ___
Color: ___

PROBE INSTALLATION

Date: ___
Method: ___
Diameter: 3/8 inch
Depth: ___
Packing Material: ___
Initial PID Reading: ___
Post PID Reading: ___

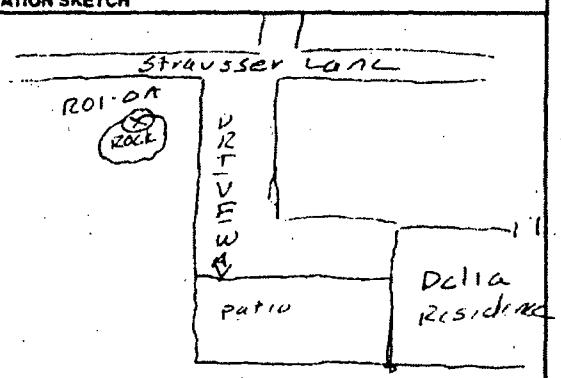
PURGE

Date: ___
Time: ___
Rate: ___
Volume: ___

SAMPLE COLLECTION

Start Time: 0921 End Time: 1834
Starting Pressure: -29.5 End Pressure: -5
Rate: 11.5 mL/min
Volume: ___
Canister Descriptic 6 L Summa

LOCATION SKETCH



OBSERVATIONS / NOTES:

Tank # 5593

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Page ___ of ___

Project Site Name:	Butz Landfill Vapor Intrusion	Sample ID Number:	R07B-IA-1-20080508
Project Number:	1060	Sampled By:	[illegible]
Sample Location:			[illegible]

DESCRIPTION OF SAMPLE LOCATION

Indoor		Outdoor	
Location:	R07B - 1st Floor	Location:	
Basement:	yes / no	Depth to Water (ft):	
Room size (ftxft):		Soil type:	
Floor material:	concrete / wood / dirt / other	Odor:	
Slab Thickness (ft):		Color:	
Visible Cracks:	yes / no		
Subslab Material:	dirt / gravel		

PROBE INSTALLATION

Date:	
Method:	
Diameter:	3/8 inch
Depth:	
Packing Material:	
Initial PID Reading:	
Post PID Reading:	

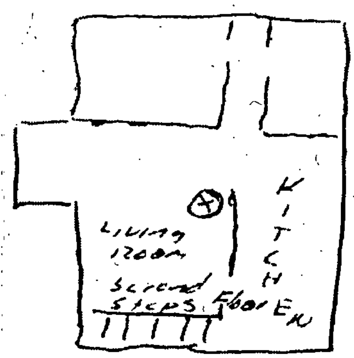
PURGE

Date:	
Time:	
Rate:	
Volume:	

SAMPLE COLLECTION

Start Time:	0857	End Time:	1845
Starting Pressure:	-30	End Pressure:	-5 PSF
Rate:	11.5 mL/min		
Volume:			
Canister Description:	6 L Summa		

LOCATION SKETCH



OBSERVATIONS / NOTES:

Can # 4373

Signature(s):

AR301421

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location: R06

Sample ID Number: R06-SV1-20080507
Sampled By: Carolina Arango
Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: R06-SV1
Basement: (yes) no
Room size (ft x ft): 27 x 27'
Floor material: (concrete) wood / dirt / other
Slab Thickness (ft): 6 in
Visible Cracks: (yes) no expansion joints
Substab Material: dirt / (gravel)

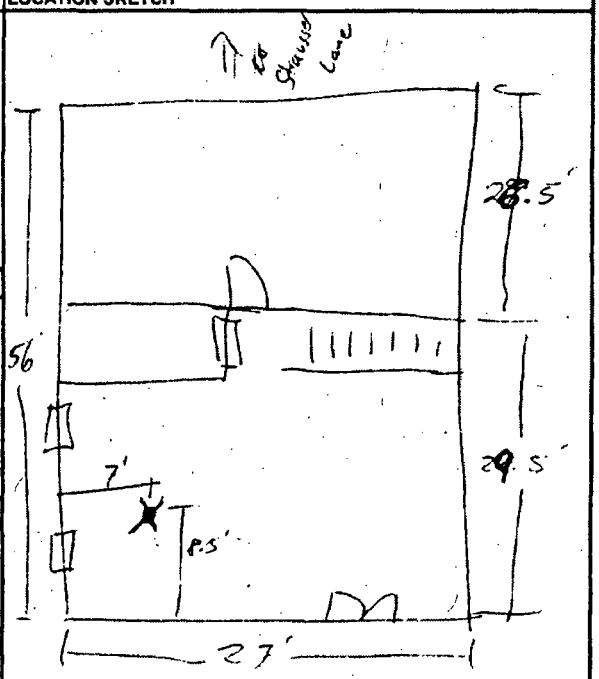
Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date: 5/7/08
Method: N/A
Diameter: 3/8 inch
Depth: 6 in
Packing Material: N/A
Initial PID Reading: 1.0, 1.7, 0.9
Post PID Reading: 0.0

LOCATION SKETCH



PURGE

Date: 5/7/08
Time: 2147
Rate: 1 L/min
Volume: 2 L

SAMPLE COLLECTION

Start Time: ~~1252~~ 1252 End Time: 1410
Starting Pressure: -30 End Pressure: -4
Rate: 111 mL/min
Volume:
Canister Descriptk 6 L Summa

OBSERVATIONS / NOTES:

Tank # 11870

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location:

Sample ID Number: R06-SV3-20080507
Sampled By: Gordon Araujo
Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: R06-SV3
Basement: (yes) / no
Room size (ftxft): 30' x 27'
Floor material: (concrete) / wood / dirt / other
Slab Thickness (ft): 6"
Visible Cracks: (yes) / no expansion joints
Subslab Material: dirt / (gravel)

Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date: 5/7/08
Method: n/a
Diameter: 3/8 inch
Depth: 6'
Packing Material: n/a
Initial PID Reading: 2.0, 0.0, 0.0
Post PID Reading: 0.0

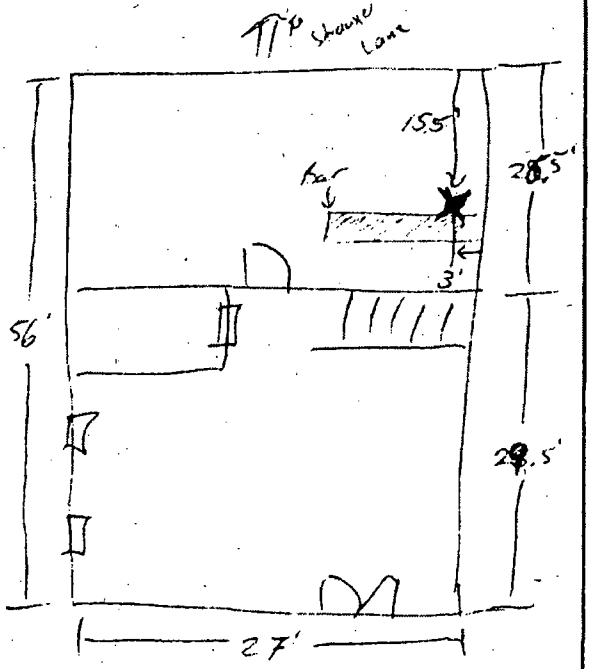
PURGE

Date: 5/7/08
Time: 1302
Rate: 1 L/min
Volume: 2L

SAMPLE COLLECTION

Start Time: 1309 End Time: ~~1510~~ 1445
Starting Pressure: 7-30 End Pressure: 4.0 psi
Rate: 111 mL/min
Volume:
Canister Descriptio 6 L Summa

LOCATION SKETCH



OBSERVATIONS / NOTES:

Tank # 31431

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location:

Sample ID Number: ROG-SV2-20080507
Sampled By: Gordon Araujo
Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: ROG-SV2
Basement: (yes) / no
Room size (ft x ft): 27' x 27'
Floor material: (concrete) / wood / dirt / other
Slab Thickness (ft): 6 in
Visible Cracks: (yes) / no expansion joint
Subslab Material: dirt / (gravel)

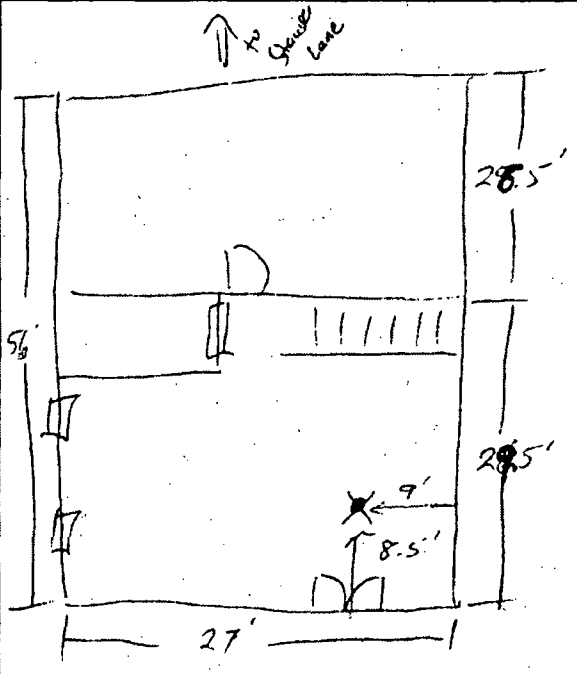
Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date: 5/7/08
Method: VIP
Diameter: 3/8 inch
Depth: 6 in
Packing Material: sand
Initial PID Reading: 4.0, 0.0, 0.0
Post PID Reading: 0.0

LOCATION SKETCH



PURGE

Date: 5/7/08
Time: 1253
Rate: 1 L/min
Volume: 2 L

SAMPLE COLLECTION

Start Time: 1308 End Time: 1427
Starting Pressure: -29 End Pressure: -4
Rate: 111 mL/min
Volume:
Canister Descriptik 6 L Summa

OBSERVATIONS / NOTES:

Tank # 3433

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location: R01

Sample ID Number: R01-SV7-20080507
Sampled By: Gordon Araujo
Mark Major

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: R01-SV7
Basement: (yes) no
Room size (ftxft):
Floor material: (concrete) / wood / dirt / other
Slab Thickness (ft): 6 in
Visible Cracks: yes (no)
Substab Material: dirt (gravel)

Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date: 5/7/08
Method: n/a
Diameter: 3/8 inch
Depth: 6 in
Packing Material: n/a
Initial PID Reading: 17.5, 5.2, 4.9
Post PID Reading: 5.8

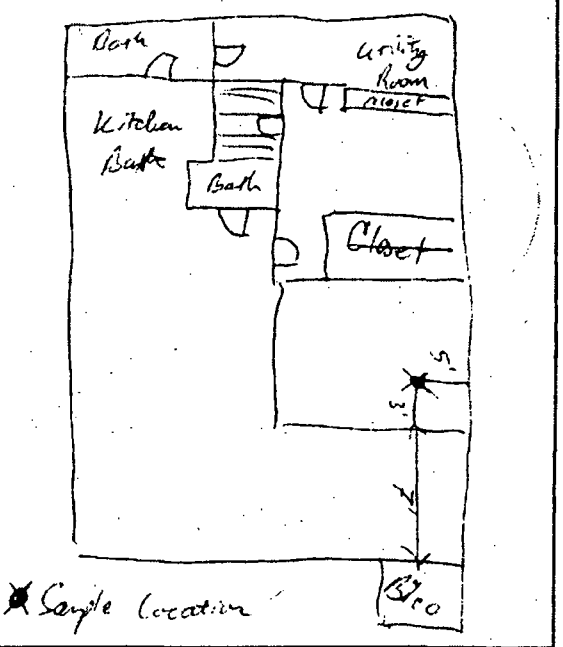
PURGE

Date: 5/7/08
Time: 1625
Rate: 1 L/min
Volume: 2 L

SAMPLE COLLECTION

Start Time: 1629 End Time: 1731
Starting Pressure: -30 End Pressure: -3.5
Rate: 111 mL/min
Volume:
Canister Descripti 6 L Summa

LOCATION SKETCH



OBSERVATIONS / NOTES:

Tank # 10776

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location: R01

Sample ID Number: R01-SV6-20080507
Sampled By: Gordon Araujo
Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: R01-SV6
Basement: (yes) / no
Room size (ft x ft):
Floor material: (concrete) / wood / dirt / other
Slab Thickness (ft): 6 in
Visible Cracks: yes / (no)
Subslab Material: dirt / (gravel)

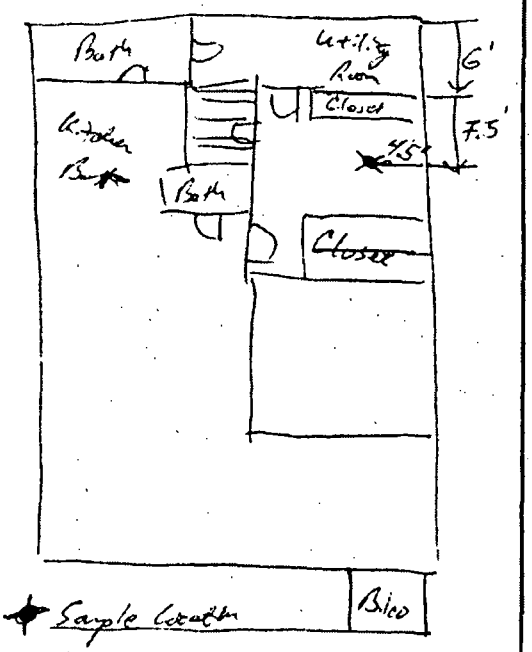
Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date: 5/7/08
Method: n/a
Diameter: 3/8 inch
Depth: 6 in
Packing Material: n/a
Initial PID Reading: 17.2, 4.1, 3.7
Post PID Reading: 5.3

LOCATION SKETCH



PURGE

Date: 5/7/08
Time: 1617
Rate: 1 L/min
Volume: 2 L

SAMPLE COLLECTION

Start Time: 1624 End Time: 1737
Starting Pressure: -28.5 End Pressure: -3.5
Rate: 111 mL/min
Volume:
Canister Description: 6 L Summa

OBSERVATIONS / NOTES:

Can # 34248

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location:

Sample ID Number: R07B-SV1-20080508
Sampled By: Gricha Araujo
Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: R07B
Basement: (yes) / no
Room size (ftxft):
Floor material: (concrete) / wood / dirt / other
Slab Thickness (ft): 9 in
Visible Cracks: (yes) / no
Subslab Material: dirt (gravel)

Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date: 5/8/08
Method: N/A
Diameter: 3/8 inch
Depth: 6in
Packing Material: N/A
Initial PID Reading: 0.0, 0.0, 0.0
Post PID Reading:

LOCATION SKETCH

PURGE

Date: 5/8/08
Time: 1605
Rate: 1 L/min
Volume: 2 L

SAMPLE COLLECTION

Start Time: 1610 End Time: 1725
Starting Pressure: -30 End Pressure: -2.5
Rate: 111 mL/min
Volume:
Canister Descriptic 6 L Summa

OBSERVATIONS / NOTES:

Tank # 421

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location: ___

Sample ID Number: R07B-OA-20080508
Sampled By: Gordon Araujo
Chuck Mayo

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: ___
Basement: yes / no
Room size (ft x ft): ___
Floor material: concrete / wood / dirt / other
Slab Thickness (ft): ___
Visible Cracks: yes / no
Subslab Material: dirt / gravel

Outdoor

Location: R07B
Depth to Water (ft): ___
Soil type: ___
Odor: ___
Color: ___

PROBE INSTALLATION

Date: ___
Method: ___
Diameter: 3/8 inch
Depth: ___
Packing Material: ___
Initial PID Reading: ___
Post PID Reading: ___

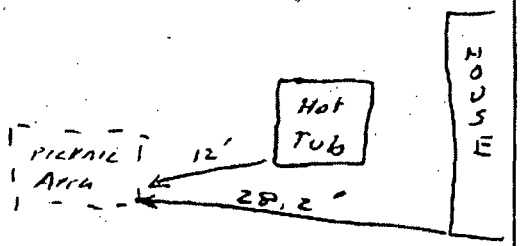
PURGE

Date: ___
Time: ___
Rate: ___
Volume: ___

SAMPLE COLLECTION

Start Time: 0907 End Time: 1827
Starting Pressure: 29 PSI End Pressure: -5 PSI
Rate: 11.5 mL/min
Volume: ___
Canister Descriptio: 6 L Summa

LOCATION SKETCH



OBSERVATIONS / NOTES:

Can # 13857

Signature(s): ___

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location:

Sample ID Number: K076-IA-B-20080508
Sampled By: Carlos Araujo
Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: K076 - Basement
Basement: (yes) / no
Room size (ftxft):
Floor material: (concrete) / wood / dirt / other
Slab Thickness (ft):
Visible Cracks: (yes) / no
Subslab Material: dirt / (gravel)

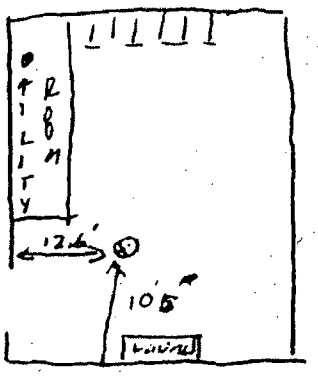
Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date: 5/8/08
Method: via
Diameter: 3/8 inch
Depth:
Packing Material:
Initial PID Reading:
Post PID Reading:

LOCATION SKETCH



PURGE

Date:
Time:
Rate:
Volume:

SAMPLE COLLECTION

Start Time: 0901 End Time: 1820
Starting Pressure: 7-30 End Pressure: -6
Rate: 11.5 ml/min
Volume:
Canister Descriptic 6 L Summa

OBSERVATIONS / NOTES:

Can # 913

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Butz Landfill Vapor Intrusion	Sample ID Number: R07B-IA-2-20080508
Project Number: 1060	Sampled By: [illegible]
Sample Location:	[illegible]

DESCRIPTION OF SAMPLE LOCATION	
Indoor	**Outdoor**
Location: R07B - 2nd Floor	Location:
Basement: yes / no	Depth to Water (ft):
Room size (ftxft):	Soil type:
Floor material: concrete / wood / dirt / other	Odor:
Slab Thickness (ft):	Color:
Visible Cracks: yes / no	
Subslab Material: dirt / gravel	

PROBE INSTALLATION

Date:
Method:
Diameter: 3/8 inch
Depth:
Packing Material:
Initial PID Reading:
Post PID Reading:

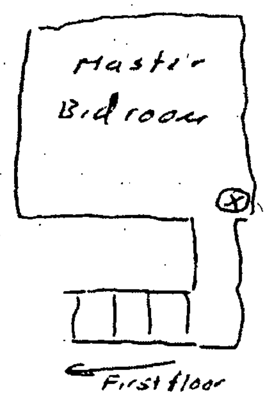
PURGE

Date:
Time:
Rate:
Volume:

SAMPLE COLLECTION

Start Time:	0900	End Time:	1843
Starting Pressure:	-30	End Pressure:	-6.5
Rate:	11.5 ml/min		
Volume:			
Canister Description:	6 L Summa		

LOCATION SKETCH



OBSERVATIONS / NOTES:

Can # 10781

Signature(s): [illegible]

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location:

Sample ID Number: R06-SV4-20080507
Sampled By: Gordon Amys
Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: R06-SV4
Basement: (yes) no
Room size (ftxft): 30'x27'
Floor material: (concrete) / wood / dirt / other
Slab Thickness (ft): 6 in
Visible Cracks: (yes) no expansion joints
Subslab Material: dirt / (gravel)

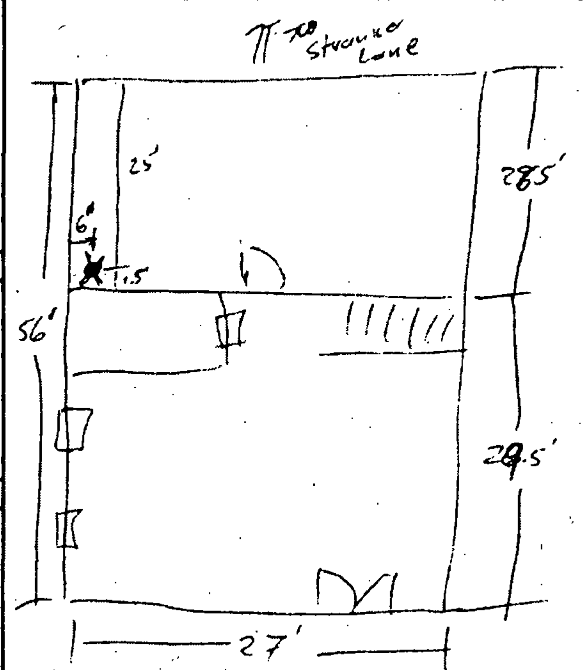
Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date: 5/7/08
Method: n/a
Diameter: 3/8 inch
Depth: 6 in
Packing Material: n/a
Initial PID Reading: 0.0, 0.0, 0.0
Post PID Reading: 0.0

LOCATION SKETCH



PURGE

Date: 5/7/08
Time: 1307
Rate: 1L/min
Volume: 2L

SAMPLE COLLECTION

Start Time: 1313
End Time: 1425
Starting Pressure: -29 psi
End Pressure: -2.5
Rate: 111 ml/min
Volume:
Canister Description: 6 L Summa

OBSERVATIONS / NOTES:

Tank # 12687

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location: ___

Sample ID Number: R01-IA-B-20080507
Sampled By: Gordon Araujo
Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: R01 - Basement
Basement: yes / no
Room size (ftxft): ___
Floor material: concrete / wood / dirt / other
Slab Thickness (ft): ___
Visible Cracks: yes / no
Substab Material: dirt / gravel

Outdoor

Location: ___
Depth to Water (ft): ___
Soil type: ___
Odor: ___
Color: ___

PROBE INSTALLATION

Date: ___
Method: ___
Diameter: 3/8 inch
Depth: ___
Packing Material: ___
Initial PID Reading: ___
Post PID Reading: ___

LOCATION SKETCH

PURGE

Date: ___
Time: ___
Rate: ___
Volume: ___

SAMPLE COLLECTION

Start Time: 0924 End Time: 1830
Starting Pressure: -30 End Pressure: -5
Rate: 11.5 mL/min
Volume: ___
Canister Descriptic 6 L Summa

OBSERVATIONS / NOTES:

Tank # 4294

Painting in basement ended 1 May 2008

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location: SG1

Sample ID Number: R01-IA-1-20080507
Sampled By: Gordon Arays
Chuck Mayer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: R01 - 1st Floor
Basement: yes / no
Room size (ftxft):
Floor material: concrete / wood / dirt / other
Slab Thickness (ft):
Visible Cracks: yes / no
Subslab Material: dirt / gravel

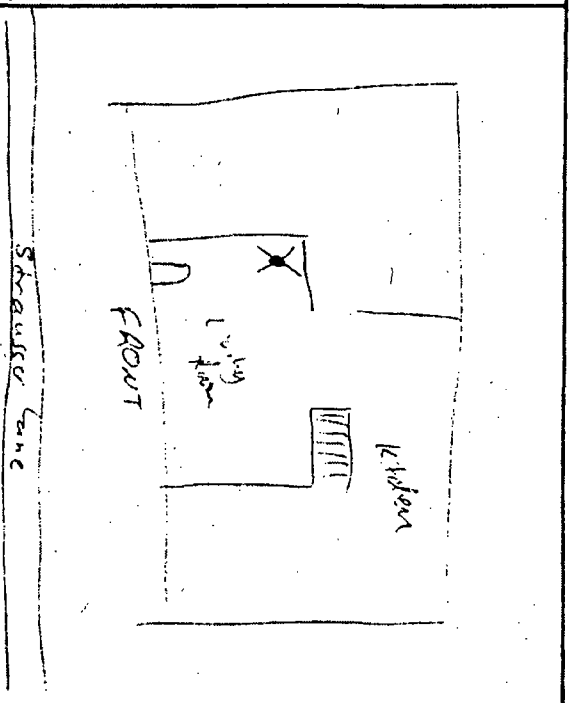
Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date:
Method:
Diameter: 3/8 inch
Depth:
Packing Material:
Initial PID Reading:
Post PID Reading:

LOCATION SKETCH



PURGE

Date:
Time:
Rate:
Volume:

SAMPLE COLLECTION

Start Time: 0928 End Time: 1653
Starting Pressure: -26.5 End Pressure: -5
Rate: 11.5 mL/min
Volume:
Canister Descriptio 6 L Summa

OBSERVATIONS / NOTES:

Tank # 4365

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location: R06

Sample ID Number: R06-IA-1-20080507
Sampled By: Gordon Araujo
Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: R06 - 1st Floor
Basement: yes / no
Room size (ftxft):
Floor material: concrete / wood / dirt / other
Slab Thickness (ft):
Visible Cracks: yes / no
Substab Material: dirt / gravel

Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date:
Method:
Diameter: 3/8 inch
Depth:
Packing Material:
Initial PID Reading:
Post PID Reading:

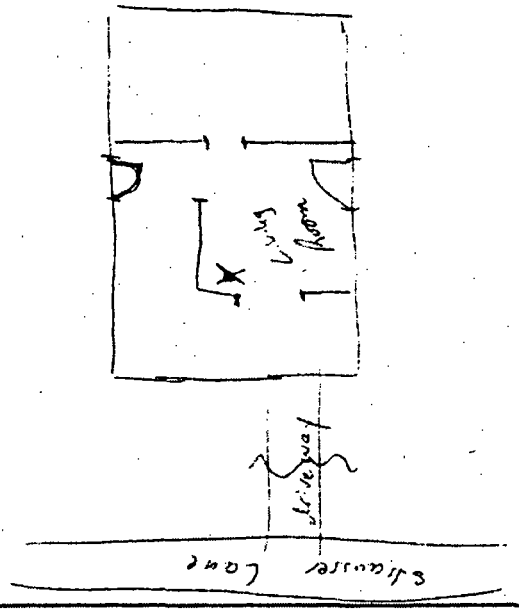
PURGE

Date:
Time:
Rate:
Volume:

SAMPLE COLLECTION

Start Time: 0901 End Time: 1642
Starting Pressure: -30 End Pressure: 0
Rate: 11.5 mL/min
Volume:
Canister Descriptic 6 L Summa

LOCATION SKETCH



OBSERVATIONS / NOTES:

Tank # 5609

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location: R01

Sample ID Number: R01-SV5-20080507
Sampled By: Gordon Araujo
Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: R01-SV5
Basement: (yes) no
Room size (ftxft):
Floor material: (concrete) wood / dirt / other
Slab Thickness (ft): 6 in
Visible Cracks: yes (no)
Subslab Material: dirt / (gravel)

Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date: 5/7/08
Method: ~1/4
Diameter: 3/8 inch
Depth: 5 ft
Packing Material: n/a
Initial PID Reading: 21.3, 4.4, 3.6
Post PID Reading: 5.6

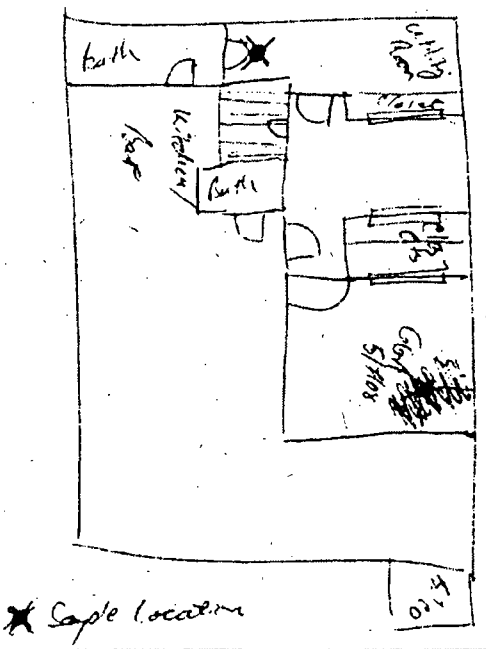
PURGE

Date: 5/7/08
Time: 1615
Rate: 1 L/min
Volume: 2 L

SAMPLE COLLECTION

Start Time: 1615 End Time: 1743
Starting Pressure: -30 End Pressure: -4.0
Rate: 111 mL/min
Volume:
Canister Descriptio: 6 L Summa

LOCATION SKETCH



OBSERVATIONS / NOTES:

Can # 5607

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location: R06

Sample ID Number: R06-0A-20080507
Sampled By: Gordon Araujo
Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location:
Basement: yes / no
Room size (ftxft):
Floor material: concrete / wood / dirt / other
Slab Thickness (ft):
Visible Cracks: yes / no
Subslab Material: dirt / gravel

Outdoor

Location: R06-0A
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date:
Method:
Diameter: 3/8 inch
Depth:
Packing Material:
Initial PID Reading: NA
Post PID Reading:

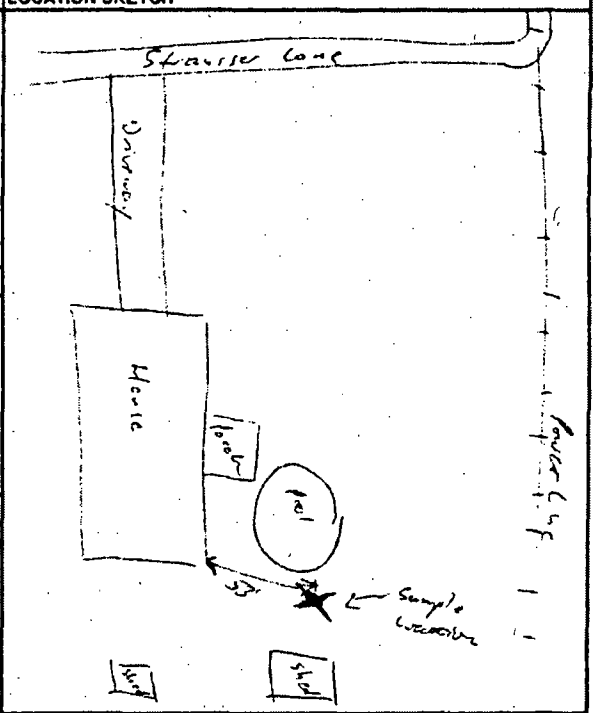
PURGE

Date:
Time:
Rate:
Volume:

SAMPLE COLLECTION

Start Time: 0904 End Time: 1701
Starting Pressure: -27 End Pressure: -4.12 psi
Rate: 11.5 mL/min
Volume:
Canister Descriptic 6 L Summa

LOCATION SKETCH



OBSERVATIONS / NOTES:

Tank # 33930

Signature(s):

Tetra Tech NUS, Inc.

SOIL VAPOR SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Butz Landfill Vapor Intrusion
Project Number: 1060
Sample Location: R06

Sample ID Number: R06-IA-B-20080507
Sampled By: Gordon Araujo
Chuck Meyer

DESCRIPTION OF SAMPLE LOCATION

Indoor

Location: R06 - Basement
Basement: yes / no
Room size (ftxft):
Floor material: concrete / wood / dirt / other
Slab Thickness (ft):
Visible Cracks: yes / no
Subslab Material: dirt / gravel

Outdoor

Location:
Depth to Water (ft):
Soil type:
Odor:
Color:

PROBE INSTALLATION

Date:
Method:
Diameter: 3/8 inch
Depth:
Packing Material:
Initial PID Reading:
Post PID Reading:

LOCATION SKETCH

PURGE

Date:
Time:
Rate:
Volume:

SAMPLE COLLECTION

Start Time: 0903 End Time: 1105
Starting Pressure: -27 End Pressure: -5.5
Rate: 11.5 mL/min-1
Volume:
Canister Descripti 6 L Summa

OBSERVATIONS / NOTES:

Tank #: 12686

Signature(s):

ATTACHMENT 2

SOIL BORING LOGS

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Butz Landfill
PROJECT NUMBER: 1060
DRILLING COMPANY: EFS
DRILLING RIG: Goeprobe

BORING No.: SB-126
DATE: 4/5/08
GEOLOGIST: Chuck Meyer
DRILLER: John Wysocki

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
			5.0			Red Brn	Silty Sand with Rock Fragments		dry			0	0
						Red Brn	Silty Sand with Rock Fragments		dry			0	0
						Red Brn	↓		dry			0	0
			4.0			Red Brn	↓		dry			0	0
			4.0			Red Brn	Silty Clay with Rock Fragments		dry			0	0
						Red Brn	Silty Clay with Rock Fragments		dry			0	0
						Red Brn	↓		dry			0	0
			4.0			Red Brn	↓		dry			0	0
			4.0			Red Brn	Silty Fine grained Sand with Rock Frag					0	0
						Red Brn	Silty Clay with rock fragments					0	0
						Red Brn	↓					0	0
			4.0			Red Brn	↓					0	0
			4.0			Red Brn	Silty Clay with rock fragments					0	0
						Red Brn	Silty clay with Rock Fragments					0	0
						Red Brn	↓					0	0
			4.0			Red Brn	↓					0	0
			4.0			Red Brn	Silty Clay with Rock Fragments					0	0
						Gray Brn	Sandy Gravel with some clay					0	0
						Gray Brn	Sandy Gravel with some clay					0	0
			4.0			Red Brn	Silty Clay with rock fragments					0	0
			4.0			Red Brn	Silty clay with rock fragments					0	0
						Red Brn	Silty clay with rock fragments					0	0
						Gray Brn	Silty clay with rock fragments					0	
			4.0			Red Brn	Silty Clay with rock fragments		Screen Interval			0	
			4.0			Red Brn	Silty clay with rock fragments		dry			0	

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: GW-126-20080508

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME:	Butz Landfill	BORING No.:	SB-R6
PROJECT NUMBER:	1060	DATE:	5/8/08
DRILLING COMPANY:	EFS	GEOLOGIST:	Chuck Meyer
DRILLING RIG:	Goeprobe	DRILLER:	John Wysocki

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	U S C S *	Remarks	Sample	Sampler BZ	Borehole**	Driller BZ**
			4.0			Red Brn	silty clay with rock fragments		Dry screened interval			0	0
						Red Brn	silty clay with rock fragments		Dry			0	0
			4.0			Red Brn	silty clay with rock fragments		Dry			0	0
			1.5			Red Brn	silty clay with rock fragments		Dry			0	0
			1.5	Refusal water		Red Brn	Rock fragments		wet			0	0

PID/FID Reading (ppm): Sample, Sampler BZ, Borehole**, Driller BZ**

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: ______

Drilling Area Background (ppm): ______

Converted to Well: Yes ______ No ______ Well I.D. #: GW-R6 20080508

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Butz Landfill
PROJECT NUMBER: 1060
DRILLING COMPANY: EFS
DRILLING RIG: Goeprobe

BORING No.: SB-R1
DATE: 5/9/08
GEOLOGIST: Chuck Meyer
DRILLER: John Wysocki

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
			2.0			Brn Red	Top soil roots silty sand rocks		Dry			0	0
						Red Brn	silty sand with rock fragments		Dry			0	0
						Red Brn	silty sand with rock fragments		Dry			0	0
			4.0			Red Brn	silty clay with rock fragments		Dry			0	0
			4.0			Brn	silty clay trace rocks		Dry			0	0
						Brn	silty clay trace rock fragments		Dry Slight Zone			0	0
						Brn	silty clay with pebbles		Dry			0	0
			4.0			Brn	silty clay trace pebbles		Dry			0	0
			4.0			Brn	silty clay with rock fragments		Dry			0	0
						Brn	silty clay with rock fragments		Dry			0	0
						Brn	silty clay with rock fragments		Dry			0	0
			4.0			Brn	silty clay with rock fragments		Dry			0	0
			3.0			Brn	silty clay with rock fragments		Dry			0	0
						Brn	silty clay with rock fragments		Dry			0	0
			4.0			Brn	silty clay with Rocks		Wet Saturated			0	0
				Refusal water									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: GW-R1-20080508

ATTACHMENT 3

LOGBOOK ENTRIES

Book #01060

Wednesday, May 7, 2008
Weather 65°F, sunny, 981 mbar (28.97 inHg)

0750 Gordon Arayu (GA) from TtNUS
arrives on-site.
GA prepares for sampling

0830 Chuck Meyer (CM) from TtNUS
arrives on-site
CM calibrates the PID

0840 GA + CM depart for Steussed (R06)
and Delia (R01) residences

0901 R06-IA-1-20080507
0903 R06-IA-B-20080507
0904 R06-OA-20080507
* see sample log sheets for
more information.

0921 R01-OA-20080507
0924 R01-IA-B-20080507
0928 R01-IA-1-20080507

[signature] 5/7/08

Butz # 01060

1000 GA and CM prepare for sub slab vapor sampling at Staunser (R06)
1245 Indoor Air PID reading = 0.8 ppm
1252 R06-SV1-20080507
1308 R06-SV2-20080507
1309 R06-SV3-20080507
1313 R06-SV4-20080507
1326 R06-SV5-20080507
Duplicate taken
DUP-01-20080507
Time 1200 on Chain of Custody

Note R06-SV5 lost pressure when removing canister from plumbing. Duplicate canister did not lose pressure.

1500 GA + CM clean at Staunser (R06) and depart for Delia (R01)

1530 Atmospheric Pressure 971 mbar ~~mmHg~~ 28.70 mm Hg

5/7/08

Butz # 01060

1550 Background PID reading of Indoor Air at R01 is 4.2 ppm in basement
Homeowner is cleaning windows on 1st floor of house.
Basement ~~was~~ is in the process of remodeling. Walls were painted with water based latex paint from Oct or as late as 5/1/08. Tile floor was laid since 5/1/08.

1615 R01-SV5-20080507
1624 R01-SV6-20080507
1629 R01-SV7-20080507
1745 TB-20080507
1755 R01-SUMP-20080507

1840 GA+CM depart Delia (R01) for Treatment Plant.
Atmospheric pressure 969 mbar
Temperature = 73°F 28.62 mm Hg
1900 GA+CM depart site

5/7/08

Burr # 01060

Thursday April 8, 2008
Weather: 38°F, drizzle

0730 Gordon Araujo (GA) and Chuck Meyer (CM) from TtNUS arrive on-site. GA + CM prepare for field activities. GA calibrates PID

0830 GA + CM arrive at Rocket (RO7B)

0835 Atmospheric Pressure 28.55" mHg 968 mbar

See Sample log sheets for info.

0857 RO7B-IA-1-20080508

0900 RO7B-IA-2-20080508

0901 RO7B-IA-B-20080508

0907 RO7B-OA-20080508

*Need to add entry

0805 John Wysocki (JW) from EFS (Environmental Field Services) arrives on-site.

0920 GA, CM, JW go to RO6 for Geoprobe Groundwater sampling.

1015 Ron Romuald (RR), Bruce Rundell (BR) from EPA Region 3 arrive on-site.

5/18/08

Burr # 01060

1130 Screen put at 24.5-29.5 ft bgs
Total well depth of 29.5 ft bgs

1140 Purge well at RO6 until water clear

1145 Wait for well to recover

1155 RO6-GW-20080508

1230 GA, CM, JW move to RO1 to geoprobe GW sampling

1330 Total depth of well is 15 feet
Screened Interval 5-15 ft
EF and RR depart site.

1335 Purge well at RO1

1340 Wait for well to recover

1345 RO1-GW-20080508

1415 GA, CM, JW move to RO7B for geoprobe GW sampling

5/18/08

Lutz #01060

1420 GA, CM, JW Start sampling @ GW

1430 After geophysics & hdsp, no groundwater was encountered. Refusal was around 6-10 ft bgs every time. Bedrock was encountered.

1635 JW departed the site.

1700 GA departs the site.

1725 CM completes collection of sample R07B-SV1-20080508

1756 CM completes collection of sample R07B-SV2-20080508 and Dup-02-20080508 with an assigned time of 1256

1820 CM completes collection of

[signature] 5/8/08

Butyl VE sampling

Sample R07B-IA-B-20080508

1843 CM completes collection of sample R07B-IA-2-20080508

1845 CM complete collection of sample R07B-IA-1-20080508

1905 CM returns rental Equipment for the 2 Day period

1915 CM arrives back at the treatment plant and Demobs equipment and supplies

1945 CM completes activities onsite heads back to the office

2130 CM arrives back at the office to complete the days activities

[signature] 5/8/08