APPENDIX B

WELL DEVELOPMENT LOGS

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: HILLCREST WELL NO.: MW-07-01

PROJECT NO.:

STAFF: [illegible]

DATE(S): 3/27/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	20.24	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	15.12	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.0	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V = 0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INIT	8	16	20	28	32					
pH	7.68	7.40	7.41	7.40	7.45	7.50					
SPEC. COND. (umhos)	561	552	552	552	555	553					
APPEARANCE	muddy	muddy	cloudy	cloudy	clear	clear					
TEMPERATURE (°C)	8.7	8.9	8.9	8.9	8.9	8.9					
TURB (NTU)	>1000	>1000	>1000	>1000	95	31					

COMMENTS: 0935 - START pumping w/ Intake + surging

1010 - STOP DEVELOPMENT

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: Hillcrest WELL NO.: MW-07-02

PROJECT NO.:

STAFF: CW

DATE(S): 3/27/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	24.83 SGT	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	18.33	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.0	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INIT	8	16	24	28	32	36				
pH	7.45	7.60	7.62	7.59	7.57	7.59	7.57				
SPEC. COND. (umhos)	479	539	545	559	566	569	565				
APPEARANCE	muddy	muddy	muddy	very cloudy	cloudy	clear	clear				
TEMPERATURE (°C)	9.7	9.6	9.6	9.6	9.6	9.5	9.6				
	71000	71000	>1000	>1000	627	64	48				

COMMENTS: 830 START pumping + surging/bailing

Stop surging after 24g, silt clears after 1.5g. will just pump until clear

0920 STOP Devel. 24.83 DTB.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: HILLCREST WELL NO.: MW-07-03

PROJECT NO.:

STAFF: RW

DATE(S): 3/27/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	27.15 SOL	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	19.96	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.0	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	INIT	12	24	36	40						
pH	7.82	7.56	7.45	7.42	7.46						
SPEC. COND. (umhos)	718	713	714	716	717						
APPEARANCE	Mod Turbid	mud/	cloudy	clear	clear						
TEMPERATURE (°C)	10.5	10.4	10.2	10.3	10.2						
	>1800	>1000	>1000	177	35						

COMMENTS:

1245 Bail 2 gallons then switch to pump

1300 Gary onsite

1320 - Stop pumping

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: MW-07-04

PROJECT NO.: _____

STAFF: [illegible]

DATE(S): 3/27/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	32.48	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	23.54	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	8.94	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.52	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	7.6	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INIT	12	24	28	32	36					
pH	7.75	7.47	7.63	7.51	7.50	7.50					
SPEC. COND. (umhos)	760	496	774	786	780	794					
APPEARANCE	muddy	muddy	muddy	cloudy	clear	clear					
TEMPERATURE (°C)	11.2	11.4	11.0	11.5	11.6	11.5					
	>1000	>1000	>1000	409	76	44					

COMMENTS:

1545 START Pumping/surging

1605 GARY PRESCOTT offsite

Stop surging after 24g

1625 Stop Develop. after 36g. 32.54 DTB

Check on pH + Transfer water

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: Hillcrest WELL NO.: MW-07-05

PROJECT NO.:

STAFF: R

DATE(S): 3/27

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	30.30 hard	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	25.52	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	4.78	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	.81	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	4.06	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INIT	8	10	14							
pH	7.74	7.56	7.50	7.48							
SPEC. COND. (umhos)	450	466	489	511							
APPEARANCE	very cloudy	clear	clear	clear							
TEMPERATURE (°C)	10.9	11.1	11.2	11.2							
Turb NTU	>1000	252	77	45							

COMMENTS: 1455 - START Pump + surge

1510 - STOP DEVELOPMENT

30.33 to bottom

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: HILLCREST WELL NO.: MW-07-06

PROJECT NO.:

STAFF: RW

DATE(S): 3/26/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	31.92	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	24.63	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 7.29	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0 1.24	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0 6.2	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V = 0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INIT	12	16	20							
pH	NA	NA	NA	NA							
SPEC. COND. (umhos)	1920	1890	1870	1850							
APPEARANCE	Muddy	Cloudy	~~Muddy~~ clear	clear							
TEMPERATURE (°C)	14.5	14.5	14.5	14.5							
TURB	>1000	>1000	289	26							

COMMENTS:

1250 Arrive @ well
pH meter malfunction.

1300 START DEVEL

1340 - Depart well site Goto XFER water

1500 - Check on MW

1506 - Go for batteries

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: Hillcrest WELL NO.: MW-07-07

PROJECT NO.:

STAFF: RP

DATE(S): 3/27/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	37.75 S.A.	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	31.51	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	6.24	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ 1.06	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	INIT	~~12~~	16	20	24						
pH	6.85	7.25	7.22	7.23	7.22						
SPEC. COND. (umhos)	1507	1464	1576	1630	1653						
APPEARANCE	muddy	~~muddy~~	cloudy	clear	clear						
TEMPERATURE (°C)	12.0	12.3	12.6	12.7	12.7						
	>1000	71000	578	146	48						

COMMENTS:

1050 START DEVEL. w/ whale (pump + surge)
FIRST 12 g very turbid then begins to clear
1152 STOP Pumping, DTB 38.23

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: Hillcrest WELL NO.: MW-07-08

PROJECT NO.:

STAFF:

DATE(S): 3/27/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	27.05 ~~27~~	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	19.10	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 7.95	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ 1.35	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	~~0~~ 6.76	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.).	=		8"	2.60

OR

$V = 0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	1ST	8	12	16	20						
pH	7.54	7.39	7.45	7.47	7.58						
SPEC. COND. (umhos)	815	826	815	799	795						
APPEARANCE	~~very~~ turbid	silty	very cloudy	cloudy	cloudy						
TEMPERATURE (°C)	11.2	11.2	11.6	11.7	11.7						
	>1000	>1000	>1000	>1000	>1000						

COMMENTS:

1340 - Bail 1g then pump

1350 - Dry after 6g Removed, recharges fast, cycle pump

1435 - STOP. DTB 27.08. WELL is not clearing up. have sufficient volume. will likely clear @ low flow Rates

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: HILLCREST WELL NO.: MW-07-09

PROJECT NO.:

STAFF: PW

DATE(S): 3/25/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	20.30 SCFT	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	13.52	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	6.78	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.15	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	5.76	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V = 0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INT	8	12	16	20	24	28	36	44	52	
pH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
SPEC. COND. (umhos)	980	980	870	870	870	870	870	860	860	870	
APPEARANCE	muddy	Muddy	cloudy	cloudy	cloudy	cloudy	cloudy	cloudy	partly cloudy	clear	
TEMPERATURE (°C)	54.0	54.1	49.0	49.1	49.1	49.0	49.1	49.6	49.5	49.0	
	7/000	7/000	7/000	7/000	7/000	7/000	7/000	7/000	48	50	

COMMENTS:

pH meter malfunctioning

1250 - START

AFTER 30g water clears relatively quickly following surges.

40g stop surging

DTB after Development 21.75'

1415 STOP DEVELOPMENT

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: Hillcrest WELL NO.: MW-07-10

PROJECT NO.:

STAFF: km

DATE(S): 3/25/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	23.85 of 1	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	16.90	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 6.95	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17 1.18	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.18 0.0 ~~5.9~~	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	0 5.9	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INIT	8	16	24	~~32~~	36	40				
pH	NA	NA	NA	NA	NA	NA	NA				
SPEC. COND. (umhos)	1080	1020	1030	1020	~~1010~~	1010	1010				
APPEARANCE	muddy	muddy	cloudy	cloudy	cloudy	clear	clear				
TEMPERATURE (°C)	9.7	10.3	10.2	10.0	10.3	10.2	10.3				
	7/1000	7/1000	7/1000	920	673	84	50				

COMMENTS: pH Malfunctioning

1440 START Developed w/ whale pump (surge + pump)

1520 STOP, DTB. 24.55

1530 HEAD TO SITE T X FOR WATER

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: HILLCREST WELL NO.: MW-07-11

PROJECT NO.:

STAFF:

DATE(S): 3/25/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	27.90	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	17.05	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 10.85	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ 1.84	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	0 9.23	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	CMT	8	16	24	32	40	48				
pH	NA	NA	NA	NA	NA	NA	NA				
SPEC. COND. (umhos)	770	840	860	840	850	850	850				
APPEARANCE	muddy	muddy	very cloudy	very cloudy	cloudy	clear	clear				
TEMPERATURE (°C)	10.6	10.3	10.0	9.6	9.9	9.8	9.9				
	>1000	>1000	>1000	>1000	616	56	48				

COMMENTS:

1600 ARRIVE @ MW-07-11

Develop using whale & surging.

1615 START PUMPING

1740 - STOP DEVELOPMENT

1810 - OFF SITE WATER

Depart site

PH meter malfunctioning

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: DEC Hillcrest WELL NO.: MW-2

PROJECT NO.:

STAFF: NATURES WAY

DATE(S): 3/26/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	33.50'	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	20.83	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 12.67	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0 2.16	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	45	8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	15	35	~~45~~							
pH	7.08	7.08	7.10	7.08							
SPEC. COND. (umhos) mS	3.08	2.92	2.55	2.56							
APPEARANCE	Silty	Silty	cloudy	clear							
TEMPERATURE (°C)	13.1	13.0	~~13~~ 14	13.3							
Turbidity	+ 1000	+ 1000	540	75							

COMMENTS: 30.85 to silt
- removed silt using S/S Bailer

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: MW-2A

PROJECT NO.: _____

STAFF: NATURES WAY

DATE(S): 3-27-08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	~~75.0~~ 76.30'	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	23.38 (before flushing)	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~-0.0~~ 52.92	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ 8.99 gal.	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	10 gal	8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)											
	initial	10 gal										
pH	17.80	7.83										
SPEC. COND. (umhos)	560	582										
APPEARANCE	muddy	muddy										
TEMPERATURE (°C)	11.4	11.6										
Turbidity	over 1000	over 1000										

COMMENTS: MW-2A silted in to (55.50'). going to try to flush out with water. (845 - 855) - Set up

(855) - Started flushing,

(937) - finished ~~flushing~~ flushing. used ±100 gal. water, last recovery at 65'-75'. recovered 55 gals. only had 75' of pipe; but was able to get tape to 76.3' top of casing.

10" - Started pumping, removed 10 gal. took time to pump - down 58' with water.

10⁴⁵ - Stopped pumping, come back later

2⁰⁰ - [redacted] water level 48.14', silt up to 70.00'.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: MW-03

PROJECT NO.: _____

STAFF: _____

DATE(S): 3/25/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	30.35' soft	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	28.56	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 9.49	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0 1.61	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0 8.06	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V = 0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	INIT	4	8.5								
pH	7.97	7.57	7.53								
SPEC. COND. (umhos)	1296	1309	1283								
APPEARANCE	Grayish very cloudy	clear	clear								
TEMPERATURE (°C)	~~10~~ 11.7	12.4	12.0								
	71000	49	22								

COMMENTS: 0900 - BEGIN pumping/surging w/ whale. Initial pulse of silty water, clears fast.

0912 - STOP PUMP. DTB 38.52'

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: MW-6

PROJECT NO.: _____

STAFF: NATURES WAY

DATE(S): 3-27-08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	56.40	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	21.88	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~00~~ 34.52	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~00~~ 5.86 gal.	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	55 gal	8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial	10 gal	30 gal								
pH	7.82	7.56	7.61	7.54							
SPEC. COND. (umhos)	614	654	710	671							
APPEARANCE	muddy	muddy	muddy	muddy							
TEMPERATURE (°C)	11.0°C	13.1°C	13.7°C	14.1°C							

COMMENTS: silted in to 41.84'

1145 - Started flushing

1215 - finished flushing; used 55 gallons, had no return. water level after flushing 20.58

1225 - Started pumping

145 - Stop pumping; pulled pump, water level at 24.43, bottom silted in to 55.53 already.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: MW-7

PROJECT NO.: _____

STAFF: NATURES WAY

DATE(S): 3-27-08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	38.14	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	17.80	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 20.34	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ 3.46	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	28 gal	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	initial	8 gal	20 gal	28 gal							
pH	7.60	7.67	7.54	7.52							
SPEC. COND. (umhos)	782	812	822	824							
APPEARANCE	Silty	cloudy	clear	clear							
TEMPERATURE (°C)	11.6°	11.9°	11.6°	11.3°							
Turbidity	600	140	80	55							

COMMENTS: 200 - start Bailing with S/S bailer to get silt out.
345 - Start pumping
415 - finished

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: DEC Hillcrest WELL NO.: MW-9

PROJECT NO.:

STAFF: NATURES WAY

DATE(S): 3-28-00

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	35.75	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	19.0	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 16.75	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ 2.84	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	35 gal	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	15	30	35							
pH	7.60	7.41	7.30	7.27							
SPEC. COND. (umhos)	1111	1081	812	1032							
APPEARANCE	Silty muddy	Silty	Silty	Silty							
TEMPERATURE (°C)	12.0	11.9°	11.8°	11.7							
Turbidity	+1000	370	820	550							

COMMENTS:

Start bailing 11:05

end bail 11:35

- Bottom of well at 35.75

Start pumping 12^00

- Stopped pumping 1245

DTW 30.3 @

DTW 19.0 @

pumped dry 4 times, would clear up then cloud up again on restart. called good at 35 gal. removed over ten well volumes.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: MW-10

PROJECT NO.: _____

STAFF: _____

DATE(S): 3/28/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	31.08	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	17.64	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 13.44	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0 2.28	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	0 11.4	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INIT	16	20	24							
pH	7.29	7.30	7.29	7.27							
SPEC. COND. (umhos)	930	933	933	934							
APPEARANCE	Silty + Sand	Gray Brown	Clear	clear							
TEMPERATURE (°C)	8.1	7.9	7.9	7.9							
	>1000	>1000	64	18							

COMMENTS: 1255 START. PUMPING + surging. f-Sand coming w/ purge water + silt

stop surging After 16g. feels like hard bottom

1328 STOP DEVELOPMENT. AFTER 24g. - DTB 32.80'

CHECK on MW + XFER WATER

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: DEC Hillcrest WELL NO.: MW-11

PROJECT NO.:

STAFF: NATURES WAY

DATE(S): 3-28-08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	40.15	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	19.5'	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 20.65	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.00~~ 3.51	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	40	8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	15gal	25	30	40						
pH	7.60	7.59	7.59	7.60	7.59						
SPEC. COND. (umhos)	957	811	843	840	820						
APPEARANCE	muddy silty	cloudy	cloudy	cloudy	clear						
TEMPERATURE (°C)	15.5°	15.6	15.8	15.7°	15.8°						
Turbidity	>1000	250	140	120	57						

COMMENTS:

DTW 19.5'
Initial bottom 32.5' to silt
start bailing 9:55a.
finished bailing 10:40
Started pumping 11:00
Stopped pumping 11:45

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: MW-14

PROJECT NO.: _____

STAFF: fw

DATE(S): 3/28/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	32.00	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	18.25	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.0	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INT	12	20								
pH	7.83	7.68	7.67								
SPEC. COND. (umhos)	893	909	902								
APPEARANCE	Brown to tan	cloudy	clear								
TEMPERATURE (°C)	10.8	10.9	11.2								
	71000	109	33								

COMMENTS: 1125 START pumping. Surge first 10g. clears fast.
1140 STOP Development. DTB 32.62 Bottom feels hard.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: MW-15

PROJECT NO.: _____

STAFF: RV

DATE(S): 3/28/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	39.79	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	20.95	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.0	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	INIT	8	12	16							
pH	7.60	7.56	7.60	7.57							
SPEC. COND. (umhos)	813	854	858	861							
APPEARANCE	silty	cloudy	clear	clear							
TEMPERATURE (°C)	11.6	11.7	11.5	11.8							
	>1000	~~>1000~~ 994	73	22							

COMMENTS:

1218 - START PUMPING, VERY SILTY TO START. THEN CLEARS FAST. SURGE DURING FIRST 8 GALLONS

1225 - STOP DEVELOPMENT. DTB 39.99.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: MW-16

PROJECT NO.: _____

STAFF: NATURES WAY

DATE(S): 3-27-08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	40.03'	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	19.0'	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 21.03	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ 3.57	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	18 gal	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	5gal	18gal								
pH	7.58	7.57	7.62								
SPEC. COND. (umhos)	780	786	784								
APPEARANCE	Silty	cloudy	clear								
TEMPERATURE (°C)	11.2	11.3	11.1								
Turbidity	845	130	25								

COMMENTS:

DTW 19'
Silt @ 36.93
Start bailing 3:40pm - 426 stop bailing
40.03' total Depth
445 - start pumping
520 - stop pumping, finished

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: MW-17

PROJECT NO.: _____

STAFF: _____

DATE(S): 3/27/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	43.65	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	27.48	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.0	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INIT	8	12	16	20	22					
pH	7.87	7.49	7.49	7.46	7.47	7.45					
SPEC. COND. (umhos)	874	1050	1059	1070	1071	1070					
APPEARANCE	muddy	cloudy	slightly cloudy	Sl. cloudy	clear	clear					
TEMPERATURE (°C)	11.8	12.8	12.8	12.9	12.8	12.8					
TURB	>1000	>1000	403	484	86	65					
					Pulled pump off Bottom ~2'						

COMMENTS:

1800 BAIL 1.5g until Lead bottom fell switch to whale pump

1835 STOP DEVELOPMENT. DTB 44.90'

1905 AFR water offsite

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: MW-18

PROJECT NO.: _____

STAFF: NATURES WAY

DATE(S): 3-27-08, 3-28-08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	22.95	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	16.18	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 6.77	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ 1.15	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	15 gal	8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	Initial	10 gal	15 gal								
pH	7.83	7.93	7.90								
SPEC. COND. (umhos)	3.34 m	1894	1904								
APPEARANCE	Silty cloudy	cloudy	clear								
TEMPERATURE (°C)	11.1°	11.5°	11.8°								
Turbidity	700	125	50								

COMMENTS: Road box damaged, water getters around it.

3-27 20.5 - Depth to silt and gravel.

4⁵⁸ - Start bailing with S/S Bailer to get silt and gravel out.

5³⁰ - Stop bailing, only able to open to 22.95. Obstructed by large rocks and gravel.

3-28 Started pumping 8³⁰

Stop pumping 9¹⁵

finished

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: DEC Hillcrest WELL NO.: MW-19

PROJECT NO.:

STAFF: NATURES WAY

DATE(S): 3-28-08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	39.95 ~~39.95~~	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	20.3'	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 19.65	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.00~~ 3.34	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V = 0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	initial	15 gal	30 gal	50 gal							
pH	7.73	7.75	7.85	7.69	7.70						
SPEC. COND. (umhos)	652	656	587	609	600						
APPEARANCE	Silty	Silty	Silty	Silty	Silty						
TEMPERATURE (°C)	12.8°	13.0	13.4°	13.5°	13.8°						
Turbidity	+1000	+1000	+1000	+1000	—						

COMMENTS: 35.52' to silt
Screen 25-40.
~5' silt
Start bailing 12:05 with S/S Bailer
Stop bailing 100
Start pumping 115
- very silty is not cleaning up, pumped 50 gal. so far.
- Stop pumping 215
- pumped 65 gallons did not clean up at all, gary said to stop.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: DEC Hillcrest WELL NO.: MW-20

PROJECT NO.:

STAFF: NATURES WAY

DATE(S): 3-28-08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	37.69	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	24.35	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 13.34	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ 2.27	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	20 gal	8"	2.60

OR
V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	10 gal	15	20							
pH	7.59	7.54	7.48	7.47							
SPEC. COND. (umhos)	741	747	751	746							
APPEARANCE	Silty	Cloudy	Clear	clear							
TEMPERATURE (°C)	11.6	11.7	11.7	12.0							
Turbidity	870	250	132	25.7							

COMMENTS: ~~[illegible] 35 40~~ Groundwater probe bouncing on hard bottom at 37.69'

35.41 DT Bottom silt

Start pumping 2:25

Stop pumping 2:55

finished

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: MW-21

PROJECT NO.: _____

STAFF: PW

DATE(S): 3/28/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	35.53	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	30.23	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 5.3	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0 .901	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	0 4.5	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	5	8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	INIT	4	5								
pH	7.72	7.67	7.60								
SPEC. COND. (umhos)	1096	1063	1067								
APPEARANCE	V. Cloudy Gray	cloudy	cloudy								
TEMPERATURE (°C)	11.8	12.7	13.3								
Turb (NTU)	>1000	420	500								

COMMENTS:

945- INIT Pulse silty material. then Rapidly clears.

0950 - Dry after 3g Removed pump intermittently. Turbidity hovers around 500. will likely clear @ low flow rates

1005 STOP DEVEL. 35.60' DTB

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: DEC Hillcrest WELL NO.: MW-22

PROJECT NO.:

STAFF: NATURES WAY

DATE(S): 3-28-08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	31.95'	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	21.21'	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 10.74'	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ 1.83	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	23 gal	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	10 gal	20 gal								
pH	7.16	7.13	7.07								
SPEC. COND. (umhos)	946	1106	1141								
APPEARANCE	Silty muddy	Cloudy	clear								
TEMPERATURE (°C)	18°	17.8°	18.4°								
Turbidity	over 1000	150	5								

COMMENTS: well ~~was~~ has no silt in screen ; was open.

- Started pumping: 1015
- finished pumping - 1045

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: HILL CREST WELL NO.: MW-25

PROJECT NO.:

STAFF: RM

DATE(S): 3/25/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	24.25	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	5.95'	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	18.30	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	3.11	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	15.6	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	20.0	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INIT	4	8	12	16	20					
pH	NA	NA	NA	NA	NA	NA					
SPEC. COND. (umhos)	970	960	960	960	960	960					
APPEARANCE	cloudy	cloudy	cloudy	partly cloudy	cloudy	cloudy					
TEMPERATURE (°F)	53.6	53.2	53.2	53.2	53.4	53.2					
TURB	7/000	7/000	550	~~420~~	549	~~371~~					

COMMENTS: DEVELOPED BY SURGING & PUMPING w/ whale pump.
STARTED
PH meter malfunctioning
DTB 24.50' After Development @ 1235

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: HILLCREST WELL NO.: MW-26

PROJECT NO.:

STAFF:

DATE(S): 3/26/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.) Bottom feels hard	=	24.25	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	11.69	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 12.56	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ 2.13	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0 10.7	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (CASING\ DIAMETER)^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INT	4	8	12							
pH	NA	NA	NA	NA							
SPEC. COND. (umhos)	330	350	250	250							
APPEARANCE	cloudy	cloudy	clear	clear							
TEMPERATURE (°C)	8.4	7.2	6.5	6.5							
Turb (ntu)	480	361	62	25							

COMMENTS: PH not functioning
1750 START
1810 OFF well
XFR water onload van, Dump sed into Drum. Sol.
1905 URS offsite

Q:/Exchange/Montroy/Geology Forms UPDATED 2005/Development Log-3/14/2008-11:11 PM

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: Hillcrest WELL NO.: MW-27

PROJECT NO.:

STAFF: [signature]

DATE(S): 3/26/08

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	~~25.91~~ 30.10	WELL ID.	VOL. (GAL/FT)
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	25.91	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 4.19	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ .71	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 5)	=	0 3.6	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	INT	8	16	24	32	44	50				
pH	NA	NA	NA	NA	NA	7.12	7.15				
SPEC. COND. (umhos)	over range	over range	over range	over range	over range	3.17 ms	3.20				
APPEARANCE	cloudy	muddy	muddy	muddy	muddy	cloudy	very cloudy				
TEMPERATURE (°C)	11.3	11.2	11.1	11.0	11.0	13.0	13.0				
Turb	>1000	----	----	----	>	>1000	>1000				

COMMENTS: 0830 - START DEVELOPMENT
VERY MUDDY BOTTOM - 2-3" silt @ Bottom of buckets
31.40 DTB AFTER 16g removed. will attempt surge block + check valve
32.78 DTB AFTER
1020 STOP DEVELOPMENT. will try + flush w/ new EQUIPMENT
1000 GARY PRISCOTT ONSITE
1640 USE SS BAILER REMOVE REMAINDER OF SILT, switch to whale.

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1730 - DTB 33.25, water still very cloudy/silty
STOP After 50g Discussed w/ Gary, likely bad sandpack/screen

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: HILLCREST WELL NO.: MW-28R

PROJECT NO.:

STAFF: PM

DATE(S): 3/26/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	29.50 Soft	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	19.04	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 10.46	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ 1.78	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	~~0~~ 8.9	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INIT	8	16	20	24						
pH	NA	NA	NA	NA	NA						
SPEC. COND. (umhos)	~~1270~~	1260	930	910	920						
APPEARANCE	muddy	muddy	cloudy	clear	clear						
TEMPERATURE (°C)	11.0	~~11.0~~	12.1	12.0	11.7						
	7/1000	1000	469	188	38						

COMMENTS:

1045 START pH meter malfunctioning

1100 ELIC ONSITE. GARY DEPARTS

1145 - Pole Probes off pH solution

1215 STOP DEVELOPMENT.

30.65' DTB after Devel.

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: HILLCREST WELL NO.: ~~MW-09~~ MW-05

PROJECT NO.:

STAFF: PW

DATE(S): 3/28/08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	37.65	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	28.36	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	9.29 ~~0.0~~	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0 1.58	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0 7.9	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	8	8"	2.60

OR

V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INIT	4	8								
pH	7.80	~~7.86~~	7.64								
SPEC. COND. (umhos)	1204	1260	1267								
APPEARANCE	grey/cloudy	clear	clear								
TEMPERATURE (°C)	12.4	~~12.5~~	12.7								
	198	15	7								

COMMENTS: 0820 START pumping / surging. intial pulse of silty material (Black) rapidly clears

0835 STOP DEVEL. WATER CLEAR. DTB 37.69'

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: MW-06

PROJECT NO.: _____

STAFF: _____

DATE(S): _____

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	28.00	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	21.85	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~6.15~~	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0 1.05	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0 5.23	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	6	8"	2.60

OR
V=0.0408 x (CASING DIAMETER)²

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	INIT	4	5	6							
pH	8.14	7.50	7.67	7.70							
SPEC. COND. (umhos)	771	1370	1398	1461							
APPEARANCE	very cloudy	cloudy	cloudy	cloudy							
TEMPERATURE (°C)	10.2	11.0	10.7	10.9							
	>1000	>1000	>1000	>1000							

COMMENTS: 1025 START Pumping/surging, intial pulse of silty material (Brown) clears rapidly: dry after 2.5g

1042 STOP AFTER 6g removed should clean up @ low flowrates DTB 28.01

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: NW-7

PROJECT NO.: _____

STAFF: NATURES WAY

DATE(S): 3-28-08

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	23.15	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	15.13	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	~~0.0~~ 8.02	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	~~0.0~~ 1.36	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	23 gal	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										
	initial	15 gal	20 gal								
pH	7.64	7.61	7.58								
SPEC. COND. (umhos)	923	909	870								
APPEARANCE	muddy	clear cloudy	clear								
TEMPERATURE (°C)	10.3°	10.6°	11.1°								
Turbidity	650	60	35								

COMMENTS: No lid on road box.
- well was open to 23.10
945 - Start pumping
910 - Stop pumping

APPENDIX C

LOW FLOW GROUNDWATER PURGING/SAMPLING LOGS

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

NW-05

Project: Hillcrest Site: ____ Well I.D.: ~~MW-17~~

Date: 7/10/08 Sampling Personnel: JOHN BOYD Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint ~~30-45~~ No log

Measuring Point: Below Top of Riser Initial Depth to Water: 29.69 Depth to Well Bottom: 37.50 7.81 Well Diameter: 2" Screen Length: ~~15~~ ?

Casing Type: PVC Volume in 1 Well Casing (liters): 4.8 LITERS Estimated Purge Volume (liters): 20 LITERS

Sample ID: ~~MW-17~~ NW-05 Sample Time: 1558 QA/QC: None

Sample Parameters: NOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1530	7.53	14.85	1.141	1.69	~~1000~~	-397.2	~~800~~	29.72
1535	~~7.75~~	14.77	1.154	0.76	937	-396.2	800	29.72
1540	7.63	14.73	1.134	0.61	141	-383.5	750	29.72
1545	7.58	14.75	1.114	0.54	96.9	-392.8	720	29.72
1550	7.58	14.74	1.096	0.54	70.1	384.7	790	29.72
1555	7.59	14.74	1.081	0.55	47.2	~~389.7~~	800	29.72
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Rate ↓

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Pump set 4' above bottom of well

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: NW-06

Date: 7/9/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: ~~GRUNDFOS~~ bailer Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint NO CONSTRUC. DATA

Measuring Point: Below Top of Riser Initial Depth to Water: 22.52 Depth to Well Bottom: 27.84 5.32 Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): 3.28 LITERS Estimated Purge Volume (liters): ≈ 2 gals

Sample ID: NW-06 Sample Time: 1906 QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1835	6.78	13.46	0.926	9.37		-355.4	≈30	24.41
1840	— well dewatered to the pump - would not recover.							
	well bailed.							
1853	8.22	16.35	0.909	9.36	>1000	-342.1	—	—
1855	8.11	14.53	0.957	9.57	~~>1000~~	-339.7	—	—
1857	8.05	14.23	0.918	9.65	736	-341.3	—	—
1859	7.97	13.83	0.936	9.65	>1000	-339.6	—	—
1902	7.96	13.40	0.928	9.72	>1000	-344.4	—	—
1904	7.87	1325	0.924	9.75	>1000	-345.1	—	—
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Pump placed 2' off bottom - Quickly dewatered well. a slow setting could NOT be set on the Grundfos. Bailed the well - very slow recovery.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: NW07

Date: 8/28/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Bailer. Tubing Type: _____ Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 21.60 Depth to Well Bottom: 23.13 Well Diameter: 2" Screen Length: ?

1.53

Casing Type: PVC Volume in 1 Well Casing (liters): 0.65 L Estimated Purge Volume (liters): 2 gals

Sample ID: NW-07 Sample Time: 1212 QA/QC: None

Sample Parameters: _____

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1030	6.91	14.47	0.830	10.36	>1000	130.0	—	—
~~1036~~	~~6.68~~	~~17.30~~	~~0.833~~	~~10.50~~	~~>1000~~	~~135.0~~	—	—
1036	6.89	14.53	0.839	11.97	>1000	136.0	—	—
1038	6.80	14.48	0.828	11.34	>1000	144.0	—	—
1041	6.76	14.37	0.827	11.85	>1000	148.3	—	—
1042	6.71	14.40	0.829	11.73	>1000	150.1	—	—
1044	6.69	14.38	0.830	11.78	>1000	151.3	—	—
1046	6.65	14.42	0.831	11.72	>1000	154.5	—	—
1048	6.67	14.45	0.831	11.52	>1000	158.0	—	—
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

23.13
21.60
1.53

617
1.53
18.51
3085
617
6497.01

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Purging ended at 1049. Well allowed to recover until sampled at.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: HILLCREST Well I.D.: MW-07-01

Date: 4/9/08 Sampling Personnel: RV Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDIFLO2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 15.21 Depth to Well Bottom: 20.26 Well Diameter: 2" Screen Length: 5.05

Casing Type: PVC Volume in 1 Well Casing (liters): 3.1 Estimated Purge Volume (liters): _____

Sample ID: MW-07-01 Sample Time: 1005 QA/QC: None

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
~~0940~~	~~7.64~~	9.25	0.434	10.82	544	272.4	1000	15.21
0945	7.13	9.28	0.432	10.41	240	270.6	1000	15.30
0950	7.21	9.62	0.435	10.26	71	266.4	1000	15.30
0955	7.23	9.60	0.438	10.19	31	265.5	1000	15.30
1000	7.23	9.73	0.438	10.01	6	266.0	1000	15.30
1005	7.23	9.76	0.439	9.98	6	267.2	1000	15.30
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-07-02

Date: 4/9/08 Sampling Personnel: RM Company: URS Corporation

Purging/Sampling Device: Grundfos Redi Flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 14.63 Depth to Well Bottom: 24.80 Well Diameter: 2" Screen Length: _____

6.17

Casing Type: PVC Volume in 1 Well Casing (liters): 3.8 Estimated Purge Volume (liters): _____

Sample ID: MW-07-02 Sample Time: 1107 QA/QC: None

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1027	6.10	10.89	0.408	5.72	>1000	352.0	1000	18.63
1032	7.38	11.09	0.447	4.09	550	341.4	1000	18.70
1037	7.44	11.18	0.460	4.49	281	331.7	1000	18.71
1042	7.44	11.25	0.465	4.78	146	327.9	1000	18.71
1047	7.43	11.33	0.468	4.98	135	324.1	1000	18.71
1052	7.43	11.27	0.469	5.15	122	320.7	1000	18.71
1057	7.42	11.20	0.468	5.21	108	319.0	1000	18.71
1102	7.42	11.18	0.468	5.30	81	317.6	1000	18.71
1107	7.42	11.22	0.469	5.38	71	316.2	1000	18.71
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: HILLCREST Well I.D.: MW-07-03

Date: 4/8/08 Sampling Personnel: [signature] Company: URS Corporation

Purging/Sampling Device: GRUNDFOS Red. f/a 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 20.00 Depth to Well Bottom: 27.23 Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: MW-07-03 Sample Time: 1040 QA/QC: None FIELD BLANK collected @ 1055 RD-040808

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1005	7.16	10.22	0.441	8.17	>1000	207.7	1000	20.00
1010	7.32	10.61	0.446	7.83	698	209.1	1000	20.07
1015	7.33	10.69	0.447	7.85	391	206.0	1000	20.07
1020	7.34	10.74	0.447	7.91	184	188.6	1000	20.07
1025	7.34	10.77	0.447	7.94	102	170.0	1000	20.07
1030	7.34	10.76	0.447	7.96	72	160.9	1000	20.07
1035	7.34	10.72	0.447	7.98	60	158.3	1000	20.07
1040	7.34	10.74	0.447		50	159.7	1000	20.07
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-07-04

Date: 4/8/08 Sampling Personnel: [signature] Company: URS Corporation

Purging/Sampling Device: GeoPump Redi-Flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 23.64 Depth to Well Bottom: 32.55 Well Diameter: 2" Screen Length: _____

8.91

Casing Type: PVC Volume in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: MW-07-04 Sample Time: 1615 QA/QC: NONE

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1540	7.29	12.95	0.522	9.03	>1000	175.6	1000	23.64
1545	7.43	12.97	0.531	8.87	710000	182.7	1000	23.68
1550	7.45	12.82	0.535	8.84	847	186.7	1000	23.68
1550	7.44	12.81	0.544	8.82	163	176.6	1000	23.68
1555	7.44	12.82	0.547	8.82	74	167.8	1000	23.68
1600	7.44	12.76	0.550	8.85	40	162.2	1000	23.68
1605	7.44	12.76	0.554	8.85	28	155.6	1000	23.68
1610	7.43	12.77	0.559	8.84	12	153.1	1000	23.68
1615	7.43	12.77	0.559	8.86	10	152.7	1000	23.68
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: HILLCREST Well I.D.: MW-07-05

Date: 4/8/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: GRUNDFOS Redi flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 25.56 Depth to Well Bottom: 30.29 Well Diameter: 2" Screen Length: _____

4.73

Casing Type: PVC Volume in 1 Well Casing (liters): 2.9 Estimated Purge Volume (liters): _____

Sample ID: MW-07-05 Sample Time: 1255 QA/QC: NONE

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1230	7.11	12.19	0.273	10.52	790	202.4	800	25.56
1235	7.56	12.47	0.275	10.31	239	198.4	800	25.66
1240	7.61	12.57	0.275	10.35	28	183.2	800	25.66
1245	7.61	12.65	0.275	10.36	16	176.5	800	25.66
1250	7.60	12.57	0.275	10.36	8	173.5	800	25.66
1255	7.60	12.60	0.275	10.34	6	173.0	800	25.66
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-07-06

Date: 4/8/08 Sampling Personnel: [signature] Company: URS Corporation

Purging/Sampling Device: Grundfos Redi Flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 24.75 Depth to Well Bottom: 31.94 Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: MW-07-06 Sample Time: 1355 QA/QC: MS/MSD

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1325	7.09	13.60	1.435	9.66	1000	224.5	1000	24.75
1330	7.33	13.82	1.492	9.52	547	216.1	1000	24.83
1335	7.36	13.92	1.485	9.49	117	175.6	1000	24.83
1340	7.36	13.90	1.478	9.51	34	156.5	1000	24.83
1345	7.37	13.96	1.476	9.52	20	143.2	1000	24.83
1350	7.37	13.94	1.467	9.50	12	137.8	1000	24.83
1355	7.37	13.92	1.464	9.51	8	140.0	1000	24.83
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: HILLCREST Well I.D.: MW-07-07

Date: 4/8/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: Grundfos Redi-flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 31.63 Depth to Well Bottom: 38.25 Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): 6.62 4.1 Estimated Purge Volume (liters): _____

Sample ID: MW-07-07 Sample Time: 915 QA/QC: _____

Sample Parameters: _____

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
845	6.23	12.62	1.119	5.59	>1000	266.3	1000	31.63
850	6.97	13.34	1.135	5.66	811	231.5	1000	31.69
855	7.11	13.68	1.168	6.01	71000	172.1	1000	31.69
900	7.14	13.60	1.173	6.44	129	142.8	1000	31.69
905	7.14	13.61	1.156	6.53	94	137.5	1000	31.69
910	7.15	13.61	1.161	6.59	121	132.1	1000	31.69
915	7.15	13.70	1.182	6.67	39	131.1	1000	31.69
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-07-08

Date: 4/8/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: Grundfos Redi flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 19.15 Depth to Well Bottom: 27.09 Well Diameter: 2" Screen Length: _____

7.94

Casing Type: PVC Volume in 1 Well Casing (liters): 4.9 Estimated Purge Volume (liters): _____

Sample ID: MW-07-08 Sample Time: 1200 QA/QC: FD-040808

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1115	6.09	11.89	0.539	7.52	>1000	259.6	1000	19.15
1120	7.29	12.65	0.548	7.03	>1000	245.3	780	20.19
1125	7.32	12.79	0.550	6.81	716	241.7	780	20.22
1130	7.34	12.90	0.551	6.50	253	235.0	710	20.18
1135	7.35	13.00	0.552	6.23	67	221.1	680	20.13
1140	7.36	13.01	0.550	6.07	37	206.0	680	20.13
1145	7.37	13.10	0.548	5.72	23	182.6	680	20.13
1150	7.37	13.12	0.548	5.70	19	168.3	680	20.13
1155	7.38	13.02	0.546	5.67	15	160.4	680	20.18
1200	7.38	13.03	0.544	5.46	11	157.6	680	20.18
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: HILLCREST Well I.D.: MW-07-09

Date: 4/7/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: GRUNDFOS Redflex 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 12.58 Depth to Well Bottom: 21.76 Well Diameter: 2" Screen Length: _____

9.18

Casing Type: PVC Volume in 1 Well Casing (liters): 5.7 L Estimated Purge Volume (liters): 30 L

Sample ID: MW-07-09 Sample Time: 1820 QA/QC: None

Sample Parameters: TCL VOC

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1750	6.84	9.99	0.639	1.37	71000	82.9	1000	12.58
1755	6.76	10.07	0.639	1.46	493	85.2	1000	12.63
1800	6.78	10.15	0.639	1.89	283	84.5	1000	12.63
1805	6.80	10.16	0.639	2.32	85	77.3	1000	12.63
1810	6.81	10.16	0.640	2.57	45	71.0	1000	12.63
1815	6.81	10.18	0.642	2.65	37	67.1	1000	12.63
1820	6.82	10.21	0.639	2.80	25	70.3	1000	12.63
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-07-10

Date: 4/7/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDIFLO 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 15.80 Depth to Well Bottom: 24.62 Well Diameter: 2" Screen Length: _____

8.82

Casing Type: PVC Volume in 1 Well Casing (liters): 5.4 L Estimated Purge Volume (liters): _____

Sample ID: MW-07-10 Sample Time: 1915 QA/QC: None

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1845	6.34	10.66	0.689	3.62	1000	159.3	1000	15.80
1850	6.67	10.80	0.691	2.67	710	191.6	1000	15.89
1855	6.76	10.85	0.690	2.80	323	147.3	1000	15.89
1900	6.77	10.89	0.687	3.08	190	141.7	1000	15.89
1905	6.78	10.82	0.683	3.41	72	142.8	1000	15.90
1910	6.77	10.83	0.683	3.52	28	145.1	1000	15.90
1915	6.78	10.85	0.682	3.60	19	144.5	1000	15.91
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-07-11

Date: 4/11/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDIFLO 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 17.11 Depth to Well Bottom: 27.92 Well Diameter: 2" Screen Length: _____

10.81

Casing Type: PVC Volume in 1 Well Casing (liters): 6.7 Estimated Purge Volume (liters): _____

Sample ID: MW-07-11 Sample Time: 1210 QA/QC: NONE

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1140	7.33	10.88	0.646	9.77	>1000	337.5	1000	17.11
1145	7.18	11.15	0.605	8.92	>1000	343.5	500	17.21
1150	7.18	11.85	0.616	8.90	846	346.5	500	17.21
1155	7.18	12.13	0.624	8.92	192	349.6	500	17.22
1200	7.15	12.29	0.623	8.90	30	351.7	500	17.22
1205	7.12	12.45	0.615	8.63	16	352.3	500	17.22
1210	7.15	12.45	0.619	8.69	11	352.3	500	17.22
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

25
19 + 1

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-02

Date: 4/10/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDIFLO 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint ~28' bgs

Measuring Point: Below Top of Riser Initial Depth to Water: 21.35 Depth to Well Bottom: 33.50 12.15 SOFT BOTTOM Well Diameter: 2" Screen Length: 15'

Casing Type: PVC Volume in 1 Well Casing (liters): 7.5 Estimated Purge Volume (liters): _____

Sample ID: MW-02 Sample Time: 1647 QA/QC: NONE

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1622	6.79	14.02	1.882	5.66	>1000	320.1	650	21.35
1627	7.20	14.12	1.941	7.64	222	317.3	650	21.46
1632	7.27	14.18	1.634	8.89	66	312.2	650	21.46
1637	7.27	14.07	1.664	8.93	27	309.3	650	21.47
1642	7.27	14.02	1.684	8.92	25	308.1	650	21.47
1647	7.27	13.99	1.692	8.93	18	306.9	650	21.47
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: ______ Site: Hillcrest Well I.D.: MW-2A

Date: 4/10/08 Sampling Personnel: [signature] Company: URS Corporation

Purging/Sampling Device: Grundfos Redi Flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 32.12 Depth to Well Bottom: 56.50' Well Diameter: 2" Screen Length: ______

Casing Type: PVC 24.38 Volume in 1 Well Casing (liters): 15.0 L Estimated Purge Volume (liters): ______

Sample ID: MW-02A Sample Time: 1805 QA/QC: None

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.) ← Approximate	DEPTH TO WATER (btor)
1725	7.40	14.04	0.767	1.01	>1000	299.1	350	32.12
1730	7.62	13.91	0.748	0.88	>1000	291.0	350	35.60
1735	7.68	17.20	0.750	1.68	>1000	264.7	350	37.40
1740	7.70	16.93	0.742	2.23	>1000	265.5	350	42.00
1745	7.71	17.00	0.738	2.43	382	267.0	350	44.10
1750	7.71	17.20	0.737	2.50	322	267.2	350	46.80
1755	7.71	18.08	0.756	2.56	327	265.1	350	49.12
1800	7.71	17.04	0.748	2.60	326	260.9	350	49.70
1805	7.71	16.91	0.747	2.48	320	259.0	350	50.10
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

— one well volume + stability

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Well has filled back in with silt since redevelopment. HEAD DROPS while pumping. SET pump 3' above silt and attempt to pump @ low rate to avoid pumping silt; pumping rate different & mult. head loss

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-03

Date: 4/9/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: Grundfos Redi Flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 28.84 Depth to Well Bottom: 38.50 Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): 9.66 5.96 Estimated Purge Volume (liters): _____

Sample ID: MW-03 Sample Time: 1550 QA/QC: _____

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1530	6.95	13.23	0.887	9.17	17	325.3	850	28.84
1535	7.18	13.59	0.913	8.85	7	322.6	850	28.89
1540	~~7.20~~	14.02	0.930	8.70	3	320.9	850	28.89
1545	7.22	14.10	0.929	8.60	2	319.7	850	28.90
1550	7.22	14.12	0.923	8.50	2	319.0	850	28.90
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-06

Date: 4/10/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDIFLO 2 Tubing Type: LDPE Pump/Tubing Inlet Location: 40-55 (47) Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 21.87 Depth to Well Bottom: 51.43 Well Diameter: 2" Screen Length: 15'

29.56 SOFT

Casing Type: PVC Volume in 1 Well Casing (liters): 18.2 Estimated Purge Volume (liters): _____

Sample ID: MW-06 Sample Time: 1920 QA/QC: None

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1840	BY PASSED		FLOW CELL		>1000			21.87
1900	7.25	16.68	0.752	0.73	>1000	258.6	1000	25.75
1905	7.31	16.15	0.682	0.16	>1000	243.0	1000	26.10
1910	7.35	16.09	0.768	0.16	>1000	236.0	1000	25.18
	Changed flow cell							
1920	7.34	15.94	0.750	0.18	>1000	234.0	1000	26.00
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Flow rate drops once site in pump

stable

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: VERY TURBID TO START BYPASS FLOW CELL

Pull pump up to 42' to get clearer sample still significant silt in samples

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: HILLCREST Well I.D.: MW-07

Date: 4/10/08 Sampling Personnel: RM Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDIFLO 2 Tubing Type: LDPE Pump/Tubing Inlet Location: near ~~Screen midpoint~~ bottom of well (32')

Measuring Point: Below Top of Riser Initial Depth to Water: 16.20 Depth to Well Bottom: 34.30 Well Diameter: 2" Screen Length: 15 (15-40)

Casing Type: PVC Volume in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: MW-07 Sample Time: 1328 QA/QC: Duplicate (FD-041008)

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1238	6.68	12.14	0.589	8.11	>1000	278.8	500	18.20
1243	7.24	12.50	0.612	7.75	846	285.0	500	18.23
1248	7.36	13.36	0.640	7.70	439	291.1	500	18.23
1253	7.37	13.51	0.646	7.70	191	295.5	500	18.23
1258	7.37	13.61	0.649	7.68	105	300.3	500	18.23
1303	7.37	13.60	0.650	7.66	97	305.3	500	18.23
1308	7.36	13.62	0.652	7.67	69	313.9	500	18.23
1313	7.35	13.67	0.655	7.65	42	320.0	500	18.23
1318	7.36	13.70	0.657	7.62	28	326.7	500	18.23
1323	7.36	13.69	0.660	7.60	22	331.6	500	18.23
1328	7.37	13.69	0.660	7.60	18	334.8	500	18.23
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: well ~ 1/2 filled w/ parking lot debris Screen

Set pump near bottom (~32')

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: HILLCREST Well I.D.: MW-09

Date: 4/11/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDIFLO 2 Tubing Type: LDPE Pump/Tubing Inlet Location: ~28' bgs Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 19.62 Depth to Well Bottom: 36.05' Well Diameter: 2" Screen Length: ~(35-20) 15'

16.43

Casing Type: PVC Volume in 1 Well Casing (liters): 10.1 Estimated Purge Volume (liters): _____

Sample ID: MW-09 Sample Time: 0852 QA/QC: NONE

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0827	6.60	11.32	1.099	6.71	71000	281.7	500	19.62
0832	6.91	12.51	1.126	5.62	748	279.3	500	19.79
0837	6.93	12.93	1.147	5.68	68	280.9	500	19.79
0842	6.93	12.96	1.151	5.68	33	282.5	500	19.79
0847	6.93	13.16	1.158	5.62	24	283.3	500	19.79
0852	6.93	13.13	1.156	5.61	20	283.7	500	19.79
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-10

Date: 4/10/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: Grundfos Redi Flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 18.20 Depth to Well Bottom: 32.80 Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): 14.60 9.0 Estimated Purge Volume (liters): _____

Sample ID: MW-10 Sample Time: 0903 QA/QC: _____

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0838	8.97	7.40	0.526	8.99	38	238.4	800	18.20
0843	8.99	7.45	0.523	8.75	4	243.7	800	18.23
0848	7.03	7.46	0.523	8.87	2	247.5	800	18.22
0853	7.03	7.49	0.522	8.89	1	251.6	800	18.22
0858	7.03	7.50	0.525	8.89	1	253.4	800	18.22
0903	7.02	7.51	0.524	8.88	1	255.5	800	18.22
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: HILLCREST Well I.D.: MW-11

Date: 4/10/08 Sampling Personnel: RM Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDIFLO 2 Tubing Type: LDPE Pump/Tubing Inlet Location: ~38' (25-40 Screen midpoint)

Measuring Point: Below Top of Riser Initial Depth to Water: 19.89 Depth to Well Bottom: 39.90 20.01 Soft Well Diameter: 2" Screen Length: 15'

Casing Type: PVC Volume in 1 Well Casing (liters): 12.3 Estimated Purge Volume (liters): _____

Sample ID: MW-11 Sample Time: 1444 QA/QC: None

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1404	6.98	16.19	0.702	5.65	>1000	443.0	680	19.89
1409	7.22	16.90	0.821	5.31	788	422.7	680	20.08
1414	7.23	17.35	0.860	4.77	366	411.8	680	20.08
1419	7.24	17.33	0.886	4.71	146	402.1	680	20.06
1424	7.24	17.36	0.880	4.78	110	396.9	680	20.06
1429	7.25	17.40	0.862	4.77	73	390.3	680	20.06
1434	7.25	17.42	0.870	4.74	41	384.6	680	20.06
1439	7.24	17.48	0.888	4.84	26	378.6	680	20.06
1444	7.24	17.43	0.890	4.79	19	375.3	680	20.06
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-14

Date: 4/9/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: Grundfos Redi flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 18.42 Depth to Well Bottom: 32.55 Well Diameter: 2" Screen Length: _____

Volume in 1 Well Casing (liters): 14.13 Estimated Purge Volume (liters): 8.7

Casing Type: PVC

Sample ID: MW-14 Sample Time: 1730 QA/QC: NONE

Sample Parameters: TCVOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1705	6.75	11.58	0.524	8.92	534	314.7	500	18.42
1710	7.45	12.96	0.541	8.58	125	311.3	500	18.45
1715	7.47	13.01	0.543	8.56	13	311.4	500	18.45
1720	7.47	13.06	0.544	8.53	8	311.8	500	18.45
1725	7.48	13.04	0.544	8.52	5	311.9	500	18.45
1730	7.48	13.07	0.545	8.54	4	312.5	500	18.45
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-15

Date: 4/9/08 Sampling Personnel: RW Company: URS Corporation

Purging/Sampling Device: Grundfos Redi Flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: 33' Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 21.05 Depth to Well Bottom: 40.00' Well Diameter: 2" Screen Length: (25-40) 15'

18.95

Casing Type: PVC Volume in 1 Well Casing (liters): 11.7 Estimated Purge Volume (liters): _____

Sample ID: MW-15 Sample Time: 1640 QA/QC: _____

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1615	6.12	12.13	0.551	9.09	583	296.8	800	21.05
1620	7.31	12.47	0.553	9.15	347	301.2	800	21.19
1625	7.38	12.66	0.558	9.08	74	303.7	800	21.25
1630	7.40	12.75	0.562	9.04	29	306.4	800	21.25
1635	7.41	12.85	0.564	8.96	20	308.4	800	21.25
1640	7.41	12.87	0.564	8.90	9	309.6	800	21.25
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-16

Date: 4/10/08 Sampling Personnel: RV Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDI FLO 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 19.32 Depth to Well Bottom: 40.21 Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: MW-16 Sample Time: 1157 QA/QC: NONE

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1127	6.96	12.15	0.587	8.80	>1000	345.1	680	19.32
1132	7.36	12.29	0.575	8.69	>1000	336.0	680	19.48
1137	7.44	12.46	0.579	8.71	151	327.0	680	19.48
1142	7.47	12.56	0.592	8.60	34	316.4	680	19.48
1147	7.48	12.55	0.600	8.51	19	310.2	680	19.48
1152	7.49	12.54	0.606	8.44	15	306.6	680	19.48
1157	7.48	12.64	0.608	8.37	11	303.2	680	19.48
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-17

Date: 4/9/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: Grundfos Redflo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 27.68 Depth to Well Bottom: 44.30 16.62 Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): 10.3 Estimated Purge Volume (liters): _____

Sample ID: MW-17 Sample Time: 0905 QA/QC: _____

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0820	~~7.56~~ 7.43	13.37	0.689	4.89	>1000	336.0	1000	27.68
0825	7.14	13.61	0.704	5.46	>1000	319.8	1000	27.68
0830	7.34	13.67	0.715	5.87	>1000	295.4	1000	27.68
0835	7.41	13.64	0.721	6.68	>1000	278.7	1000	27.68
0840	7.41	13.64	0.727	6.50	>1000	271.8	1000	27.68
0845	7.41	13.65	0.728	6.55	>1000	260.3	1000	27.68
0850	7.41	13.62	0.727	6.56	869	256.0	1000	27.68
0855	7.41	13.65	0.727	6.59	766	249.9	1000	27.68
0900	7.41	13.63	0.727	6.59	957	245.6	1000	27.68
0905	7.41	13.66	0.729	6.56	662	242.3	1000	27.68
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-18

Date: 4/10/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: Grundfos Redi-Flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: ~~Screen midpoint~~ Set pump @ bottom

Measuring Point: Below Top of Riser Initial Depth to Water: 16.55 Depth to Well Bottom: 23.00 Well Diameter: 2" Screen Length: 15 (20-35) (ie top of screen)

Casing Type: PVC Volume in 1 Well Casing (liters): 6.45 3.98 Estimated Purge Volume (liters): _____

Sample ID: MW-18 Sample Time: 1100 QA/QC: NONE

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1030	6.80	11.48	0.659	8.68	20	256.5	680	16.55
1035	7.33	11.78	0.663	8.28	6	258.3	680	16.59
1040	7.43	11.91	0.666	8.14	2	260.8	680	16.59
1045	7.44	11.94	0.667	8.05	2	265.7	680	16.59
1050	7.44	12.16	0.669	8.00	0	269.0	680	16.59
1055	7.45	12.05	0.668	7.97	0	272.1	680	16.59
1100	7.45	12.08	0.669	7.95	0	273.5	680	16.59
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Screen filled with Coarse SAND + Fine gravel (Particulate debris)

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: HILLCREST Well I.D.: MW-19

Date: 4/9/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDI FLO 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 21.00 Depth to Well Bottom: 39.65 Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: MW-19 Sample Time: 1853 QA/QC: NONE

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	
1818	7.07	13.18	0.563	0.61	>1000	263.0	600	21.00	
1823	7.46	14.97	0.584	0.30	>1000	244.3	540	23.00	change flow cell
1828	7.49	14.80	0.579	0.50	>1000	251.2	600	23.65	
1833	7.55	15.08	0.556	0.27	>1000	221.3	600	23.70	
1838	7.52	15.06	0.563	0.19	>1000	212.6	600	23.74	
1843	7.52	15.14	0.563	0.17	>1000	209.6	600	23.74	
1848	7.53	15.18	0.562	0.16	>1000	205.5	600	23.74	
1853	7.53	15.24	0.560	0.16	>1000	203.0	600	23.74	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: BURNING Plastic smell in air while sampling

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-20

Date: 4/8/05 Sampling Personnel: [signature] Company: URS Corporation

Purging/Sampling Device: Grundfos Redi Flo2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 24.59 Depth to Well Bottom: 37.80 Well Diameter: _____ Screen Length: 35-40 bgs 5

Casing Type: PVC Volume in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: MW-20 Sample Time: 1500 QA/QC: None

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1425	7.19	12.87	0.648	10.94	>1000	188.1	1000	24.59
1430	7.18	13.13	0.651	10.96	851	186.5	1000	25.65
1435	7.23	13.27	0.662	10.84	389	183.3	1000	25.68
1440	7.24	13.18	0.664	10.69	76	182.0	1000	25.76
1445	7.25	13.28	0.666	10.49	54	170.8	920	25.63
1450	7.25	13.33	0.667	10.27	16	159.6	920	25.64
1455	7.25	13.32	0.668	10.16	11	157.0	920	25.63
1500	7.25	13.29	0.668	10.08	10	155.3	920	25.63
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

Go to XFER water

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-21

Date: 4/8/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: Grundfos Redi flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 30.18 Depth to Well Bottom: 35.60 Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): 5.42 3.3 Estimated Purge Volume (liters): _____

Sample ID: MW-21 Sample Time: 1815 QA/QC: None

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1740	7.48	13.58	0.824	7.62	342	207.3	650	30.18
1750	7.41	15.71	0.877	7.46	300	187.4	185	31.48
1755	7.40	16.38	0.907	7.04	92	157.6	180	31.62
1800	7.40	17.34	0.928	6.86	53	140.6	170	31.60
1805	7.40	17.25	0.924	6.62	24	116.3	170	31.51
1810	7.40	17.44	0.917	6.50	20	123.2	170	31.40
1815	7.41	17.02	0.905	6.57	22	122.2	170	31.40
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-22

Date: 4/10/08 Sampling Personnel: [illegible] Company: URS Corporation

Purging/Sampling Device: Grundfos Rediflo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: ~~Screen midpoint~~ 23' bgs (15-30')

Measuring Point: Below Top of Riser Initial Depth to Water: 21.58 Depth to Well Bottom: 32.11 Well Diameter: 2" Screen Length: 15

10.53

Casing Type: PVC Volume in 1 Well Casing (liters): 6.5 Estimated Purge Volume (liters): _____

Sample ID: MW-22 Sample Time: 1555 QA/QC: MS/MSD

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1515	6.74	19.63	0.884	7.23	123	341.4	500	21.58
1520	6.89	19.86	0.930	6.72	138	341.9	500	21.62
1525	6.76	20.68	1.040	5.65	160	347.9	500	21.62
1530	6.77	21.02	1.113	4.39	122	347.3	500	21.62
1535	6.80	20.86	1.142	3.75	74	347.5	500	21.62
1540	6.82	20.76	1.169	3.33	53	347.1	500	21.62
1545	6.82	20.90	1.197	3.03	36	346.2	500	21.62
1550	6.82	20.79	1.196	2.93	23	344.6	500	21.62
1555	6.83	20.92	1.207	2.83	22	343.2	500	21.62
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: HILLCREST Well I.D.: MW-25

Date: 6/7/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDIFLO 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 5.72 Depth to Well Bottom: 24.48 Well Diameter: 2" Screen Length: _____

18.76

Casing Type: PVC Volume in 1 Well Casing (liters): 11.6 Estimated Purge Volume (liters): 25.0

Sample ID: MW-25 Sample Time: 1725 QA/QC: None

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1700	6.53	11.10	0.749	8.70	307	341.0	1000	5.72
1705	7.31	11.40	0.749	8.62	40	297.3	1000	6.03
1710	7.41	11.60	0.753	8.68	22	263.6	1000	6.01
1715	7.42	11.64	0.755	8.69	20	252.7	1000	6.02
1720	7.43	11.68	0.755	8.69	13	245.8	1000	6.02
1725	7.43	11.67	0.758	8.70	12	243.3	1000	6.02
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: Hillcrest Well I.D.: MW-26

Date: 4/7/08 Sampling Personnel: (ur) Company: URS Corporation

Purging/Sampling Device: Grundfos 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 10.49 Depth to Well Bottom: 27.26 Well Diameter: 2" Screen Length:

16.77

Casing Type: PVC Volume in 1 Well Casing (liters): 10.35L Estimated Purge Volume (liters): 16.4

Sample ID: MW-26 Sample Time: 1625 QA/QC: None

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1600	7.10	5.99	0.133	12.39	87	174.7	620	10.43
1605	6.81	6.35	0.133	11.36	63	178.0	620	10.94
1610	6.67	6.48	0.133	11.35	28	182.0	680	10.94
1615	6.61	6.45	0.133	11.27	15	185.2	680	10.94
1620	6.58	6.44	0.133	11.20	10	188.1	680	10.94
1625	6.56	6.44	0.133	11.15	7	191.9	680	10.94
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

There may be a bailer stuck in well, w/ indicator goes by obstruction @ 24.5'

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: HILLCREST Well I.D.: MW-27

Date: 4/11/08 Sampling Personnel: [redacted] Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDI FLO 2 Tubing Type: LDPE Pump/Tubing Inlet Location: No Log Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 26.05 Depth to Well Bottom: 32.55 Well Diameter: 2" Screen Length: No Log

Casing Type: PVC Volume in 1 Well Casing (liters): 6.5 4.0 L Estimated Purge Volume (liters): _____

Sample ID: MW-27 Sample Time: 1038 QA/QC: _____

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	
0958	6.42	12.32	3.690	9.91	>1000	467.8	680	26.05	
~~0958~~ 1003	7.28	13.42	3.814	9.33	78	435.1	680	26.11	
1008	7.38	13.64	3.836	9.44	58	417.2	680	26.19	
1013	7.38	13.82	3.844	9.45	32	405.2	680	26.21	change flow
1018	7.38	13.89	3.846	9.49	65	398.9	600	26.28	
1023	7.38	14.08	3.872	9.43	50	392.0	600	26.30	
1028	7.37	14.20	3.921	9.44	73	385.1	600	26.34	
1033	7.34	14.16	4.022	9.45	>1000	380.2	600	26.41	
1038	7.30	14.81	4.057	9.36	>1000	375.7	600	26.42	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: MW-28R

Date: 4/8/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: GRUNDFOS Redi flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 19.17 Depth to Well Bottom: 30.64 Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: MW-28R Sample Time: 1720 QA/QC: None

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1645	6.79	12.16	0.678	5.55	>1000	204.7	1000	19.17
1650	7.06	12.38	0.679	5.33	>1000	200.5	1000	19.21
1655	7.14	12.30	0.667	5.79	>1000	204.0	1000	19.21
1700	7.14	12.21	0.662	5.73	453	202.6	1000	19.21
1705	7.15	12.23	0.658	5.60	111	197.7	1000	19.21
1710	7.15	12.26	0.656	5.55	46	190.0	1000	19.21
1715	7.15	12.28	0.655	5.52	24	185.0	1000	19.21
1720	7.15	12.25	0.653	5.53	15	180.2	1000	19.21
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: NW-05

Date: 4/9/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDI FLO 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 28.39 Depth to Well Bottom: 37.63 Well Diameter: 2" Screen Length: _____

Volume in 1 Well Casing (liters): 9.24 5.7 Estimated Purge Volume (liters): _____

Casing Type: PVC

Sample ID: NW-05 Sample Time: 1451 QA/QC: _____

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1400	6.85	14.27	0.929	6.07	7100	459.4	1000	28.39
1405	7.22	14.61	0.988	5.61	212	439.3	1000	28.39
1410	7.24	14.66	1.024	5.47	52	423.0	1000	28.39
1415	7.24	14.67	1.033	5.29	33	412.3	1000	28.39
1420	7.24	14.73	1.033	5.22	26	400.8	1000	28.39
1425	7.24	14.75	1.028	5.17	21	391.0	1000	28.39
1430	7.24	14.85	1.018	5.08	19	378.1	1000	28.39
1433	7.24	14.87	1.015	5.08	18	374.8	1000	28.39
1436	7.24	14.89	1.013	5.06	17	365.0	1000	28.39
1439	7.24	14.88	1.011	5.02	14	361.1	1000	28.39
1442	7.24	14.90	1.006	4.98	13	354.6	1000	28.39
1445	7.23	14.87	1.003	4.97	12	346.8	1000	28.39
1448	7.24	14.87	1.002	4.93	10	342.6	1000	28.39
1451	7.24	14.89	1.001	4.92	10	337.2	1000	28.39
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: Hillcrest Well I.D.: ~~MW~~ NW-06

Date: 4/8/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: Grundfos Redi-Flo 2 Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 21.87 Depth to Well Bottom: 28.04 Well Diameter: 2" Screen Length: _____

6.17

Casing Type: PVC Volume in 1 Well Casing (liters): 3.8 Estimated Purge Volume (liters): _____

Sample ID: NW-06 Sample Time: 1905 QA/QC: NONE

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1845	7.10	11.55	0.926	10.27	281	166.0	~~800~~ 920	21.87
1850	7.37	12.17	0.918	9.86	233	164.2	600	23.60
1855	7.44	12.81	0.964	9.84	154	168.2	600	23.65
1900	7.45	12.92	0.977	9.92	43	168.1	550	23.70
1905	7.45	12.94	0.974	9.88	25	169.2	550	23.70
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: HILLCREST Well I.D.: NW-07

Date: 4/10/08 Sampling Personnel: _____ Company: URS Corporation

Purging/Sampling Device: GRUNDFOS REDI FLO 2 Tubing Type: 1/2" RE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 16.01 Depth to Well Bottom: 23.35 Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): 7.34 4.5 Estimated Purge Volume (liters): 15

Sample ID: NW-07 Sample Time: 0955 QA/QC: RINSE BLANK over ~~NONE~~ Pump RB-040808 @ 1005

Sample Parameters: TCL VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0935	6.56	11.34	0.796	9.69	665	288.3	750	16.01
0940	7.29	12.04	0.815	9.23	147	279.3	750	16.07
0945	7.33	12.31	0.822	9.17	51	275.8	750	16.01
0950	7.33	12.36	0.823	9.13	20	274.6	750	16.01
0955	7.33	12.36	0.825	9.11	10	274.6	750	16.01
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-07-02

Date: 7/10/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint, 15'-25'

Measuring Point: Below Top of Riser Initial Depth to Water: 21.57 Depth to Well Bottom: 24.70 / 3.13 Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 2 LITERS Estimated Purge Volume (liters): 20 LITERS

Sample ID: MW-07-02 Sample Time: 1307 QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	
1225	7.68	11.74	0.517	4.94	>1000	-370.6	750	22.66	RATE ↓
1230	7.27	12.53	0.529	5.22	>1000	-362.8	520	22.50	
1235	6.96	13.29	0.537	7.10	>1000	-350.2	590	22.48	
1240	6.80	13.79	0.542	7.05	703	-348.3	580	22.35	
1245	6.58	13.15	0.536	7.00	231	-346.2	500	22.38*	* HARD TO READ THE DEPTH METER ACTING UP
1250	6.76	13.17	0.534	6.78	192	-346.6	500	22.46	
1255	6.85	13.19	0.535	6.88	182	-345.4	500	22.58	
1300	6.83	13.20	0.535	6.81	2671	-344.1	500	22.49	
1305	6.83	13.22	0.536	6.78	432	-343.9	520	22.61	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Pump about 1½' off bottom, Then moved to bottom, Then 6" off bottom. Silt content actually began to increase near the end of purging?

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-07-03

Date: 7/8/08 Sampling Personnel: Tom Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: ~~Poly~~ LDPE Pump/Tubing Inlet Location: Screen midpoint (17.5-27.5')

Measuring Point: Below Top of Riser Initial Depth to Water: 22.43 Depth to Well Bottom: 27.07 Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 2.86 Liters Estimated Purge Volume (liters): ~~2.86~~ +2 2.5 gals

Sample ID: MW-07-03 Sample Time: 1105 QA/QC: Dup 20080708-FD-1

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1035	8.28	14.50	0.490	8.70	>1000	-199.5	640	22.55
1041	7.57	12.63	0.495	7.41	>1000	-174.9	370	22.48
1045	7.56	13.53	0.488	7.33	>1000	-181.6	320	22.47
1049	7.64	15.37	0.509	7.10	874	-187.9	530	22.47
1053	7.61	15.51	0.512	7.05	677	-185.8	340	22.47
1057	7.63	16.07	0.520	6.96	545	-184.9	310	22.47
1101	7.69	16.92	0.531	6.89	458	-187.8	240	22.47
1103	7.70	16.92	0.531	6.87	282	-183.9	240	22.43
					160			
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-07-04

Date: 7/10/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint (22.5 - 32.5')

Measuring Point: Below Top of Riser Initial Depth to Water: 26.65 Depth to Well Bottom: 32.35 Well Diameter: 2" Screen Length: 10'

5.7

Casing Type: PVC Volume in 1 Well Casing (liters): 3.52 Liters Estimated Purge Volume (liters): 7 gals

Sample ID: MW-07-04 Sample Time: 0917 QA/QC: 20080710-FD-1 (Dup)

Sample Parameters: _____

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0850	8.18	13.45	0.560	9.95	>1000	-347.7	800	26.70
0855	7.67	13.37	0.600	9.13	>1000	-347.5	760	26.70
0900	7.26	13.73	0.611	9.15	558	-343.5	800	26.70
0905	6.77	13.68	0.612	9.19	124	-340.9	780	26.70
0910	6.57	13.46	0.608	9.19	59.1	340.1	790	26.70
0915	6.57	13.61	0.611	9.19	31.0	-339.4	850	26.70
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-07-05

Date: 7/8/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/ Sampling Device: Bailer ~~Grundfos~~ Tubing Type: ~~Poly~~ LDPE Pump/Tubing Inlet Location: Screen midpoint (20'-30')

Measuring Point: Below Top of Riser Initial Depth to Water: 28.6 Depth to Well Bottom: 30.17 Well Diameter: 2" Screen Length: 10'

1.57' × 6.17 =

Casing Type: PVC Volume in 1 Well Casing (liters): 0.969 LITER Estimated Purge Volume (liters): ≈ 1 gallon

Sample ID: MW-07-05 Sample Time: 1220 QA/QC: None

Sample Parameters: VOC's NOTE: only about 8" above pump intake - ~~Bail~~ well was bailed - about 5" of water while bailing

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1156	~~8.36~~	14.77	0.180	10.19	>1000	-195.06	—	—
1159	~~7.77~~	13.26	0.175	9.81	>1000	-193.6	—	—
1201	~~7.55~~	12.89	0.327	9.72	~~>1000~~	-204.3	—	—
1205	7.45	12.56	0.323	9.58	>1000	-195.0	—	—
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-07-06

Date: 7/8/07 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: ~~Poly~~ LDPE Pump/Tubing Inlet Location: Screen midpoint 22'-32'

Measuring Point: Below Top of Riser Initial Depth to Water: ~~28.71~~ 27.71 Depth to Well Bottom: 31.75 / 3.04 Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 1.88 LITERS Estimated Purge Volume (liters): 4 gals

Sample ID: MW-07-06 Sample Time: 1735 QA/QC: MS/MSD (3 40ml bottles)

Sample Parameters: VOC's

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
~~1710~~	6.60	14.86	2.34	10.42	>1000	-55.5	~~780~~	~~27.78~~
1715	7.03	15.06	2.80	9.86	700	-110.1	540	27.78
1720	7.08	15.34	2.25	9.84	371	-137.1	540	27.78
~~1725~~	~~7.12~~	15.48	2.22	~~9.84~~ 9.84	95	-150.4	~~338~~	~~27.75~~
1730	7.12	15.35	2.11	9.81	43.1	-155.9	530	27.71
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-07-07

Date: 7/8/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: ~~Poly~~ LDPE Pump/Tubing Inlet Location: Screen midpoint (28-38')

Measuring Point: Below Top of Riser Initial Depth to Water: 33.77 Depth to Well Bottom: 38.08 / 4.31' Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 2.66 LITERS Estimated Purge Volume (liters): 3 gals

Sample ID: MW-07-07 Sample Time: 1615 QA/QC: none

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1545	8.33	15.67	0.732	7.83	>1000	-190.4	760	33.85
1550	7.44	14.86	0.710	7.18	>1000	-152.8	390	33.85
1555	7.30	16.10	0.737	7.26	>1000	-140.2	390	33.91
1600	7.26	16.66	0.756	7.28	>1000	-148.8	360	33.82
1605	7.26	16.85	0.766	7.30	>1000	-151.2	380	33.84
1610	7.25	16.79	0.771	7.37	>1000	-152.6	380	33.85
1615	7.25	16.85	0.778	7.37	1000	-152.6	380	33.85
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-07-08

Date: 7/8/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: ~~Poly~~ LDPE Pump/Tubing Inlet Location: Screen midpoint (27-17')

Measuring Point: Below Top of Riser Initial Depth to Water: 21.47 Depth to Well Bottom: ~~27.92~~ 26.92 Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 3.36 Liters Estimated Purge Volume (liters): _____

Sample ID: MW-07-08 Sample Time: 1320 QA/QC: ~~MS/MSD @1330 Taken~~

Sample Parameters: 5.45' x 617 = 3.36 LITERS
VOC's

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1248	6.39	13.40	0.547	7.58	>1000	-43.1	-	22.20
1251	6.92	13.59	0.555	6.39	>1000	-100.8	1000	22.42
1254	6.98	13.79	0.555	6.25	917	-119.0	1000	~~630~~
1257	7.02	14.43	0.565	6.21	353	-151	500	22.13
1300	7.06	14.84	0.572	6.42	230	-175.6	390	21.89
1305	7.17	15.22	0.590	6.25	149	-191.5	385	21.90
1308	7.20	15.96	0.585	6.32	48.9	-194.0	360	21.88
1312	7.18	15.87	0.586	6.52	44	-194.9	360	21.86
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-07-09

Date: 8/28/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 17.20 Depth to Well Bottom: 21.52 Well Diameter: 2" Screen Length: 9'-22' 13

Casing Type: PVC Volume in 1 Well Casing (liters): 2.56 L Estimated Purge Volume (liters): 8 gals

Sample ID: MW-07-09 Sample Time: 0825 QA/QC: MS/MSD

Sample Parameters: VOC's

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l) %	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0746	7.49	11.24	0.014	86.4 %	133	67.7	760	—
0750	7.11	11.65	0.688	48.8 %	135	45.3	760	17.28
0755	6.86	11.88	0.689	29.6 %	133	36.4	850	17.28
0800	6.73	11.69	0.681	17.2 %	39	37.3	860	17.27
0805	6.70	11.71	0.680	13.3 %	~~3920~~	40.3	960	17.27
0810	6.68	11.73	0.679	~~9.91~~ 1.06 mg/L	10	45.9	920	17.28
—	—	—	—	mg/L	—	—	—	—
0815	6.59	11.75	0.680	0.95	6	47.6	950	17.28
0820	6.57	11.73	0.679	0.91	6	48.3	950	17.28
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hellam Site: _____ Well I.D.: MW-07-10

Date: 8/28/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint 16'-25'

Measuring Point: Below Top of Riser Initial Depth to Water: 20.51 Depth to Well Bottom: 24.38 3.87' Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 2.98 L Estimated Purge Volume (liters): 8gal/s

Sample ID: MW-07-10 Sample Time: 0948 QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0915	6.41	11.69	0.759	7.86	370	71.8	640	20.54
0920	6.44	12.20	0.766	6.28	46	63.1	830	20.54
0925	6.36	12.19	0.764	5.31	25	60.7	920	20.54
0930	6.31	12.12	0.760	4.80	19	59.0	950	20.54
0935	6.26	12.21	0.762	4.06	16	56.2	950	20.55
0940	6.2622	12.24	0.761	3.55	21	54.7	950	20.54
0945	6.21	12.24	0.761	3.26	12	54.6	950	20.54
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

24.38
20.51
3.87

6.17
3.87
4319
4936
2451
2.98779

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-07-11

Date: 7/8/08 Sampling Personnel: J. Boyd Company: URS Corporation

Purging/Sampling Device: GRUNDFOS Tubing Type: ~~poly~~ LDPE Pump/Tubing Inlet Location: Screen midpoint (13-28')

Measuring Point: Below Top of Riser Initial Depth to Water: 21.08 Depth to Well Bottom: 27.75 Well Diameter: 2" Screen Length: 15'

Casing Type: PVC Volume in 1 Well Casing (liters): 4.115 Estimated Purge Volume (liters): 5 gals

Sample ID: MW-07-11 Sample Time: 0940 QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0912	7.94	13.13	0.637	~~31.0~~	>1000	~~-18~~	425	22.24
0919	7.44	13.45	0643	~~26.1~~	>1000	-180	540	21.04
0925	7.49	13.96	0.651	2.65	>1000	-196	550	21.04
0928	7.51	13.94	0.654	2.63	>1000	-204.1	~~563~~ 550	21.06
0932	7.51	14.24	0.655	2.57	863	-206.3	550	21.06
0937	7.51	14.15	0.659	2.53	~~981~~ 274	207.2	550	21.08
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

22.24

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-02

Date: 8/28/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: HDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 25.52' Depth to Well Bottom: 32.84' Well Diameter: 2" Screen Length: 15

Casing Type: PVC Volume in 1 Well Casing (liters): 2" Estimated Purge Volume (liters): 14 gals

Sample ID: MW-02 Sample Time: 1328. QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1245	5.19	14.09	0.589	6.56	>1000	87.2	>1000	28.67
1250	6.48	1420	0.599	8.21	>1000	52.1	>1000	29.54
1255	6.50	14.06	0.599	8.56	>1000	16.9	1000	29.98
1300	6.45	14.02	0.600	7.42	>1000	74.7	≈1200	29.95
1305	6.43	14.05	0.599	7.05	>1000	87.7	1150	29.78
1310	6.41	13.91	0.594	7.13	>1000	97.2	1150	29.88
1315	6.35	13.75	0.593	8.43	>1000	106.1	1150	29.91
1320	6.39	13.97	0.597	7.38	>1000	107.5	1150	29.78
1325	6.40	13.97	0.600	7.45	>1000	109.2	1150	29.71
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Pump set at ≈ 2' off bottom. Cannot pump less than ≈ 1100 LITERS/min. for 1ST 15 minutes. Actually for all 3 the TEST. LOTS of silt.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: ______ Well I.D.: MW-02A

Date: 8/28/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 33.01 Depth to Well Bottom: 54.10 soft Well Diameter: 2" Screen Length: no data

Casing Type: PVC Volume in 1 Well Casing (liters): 13.01 L Estimated Purge Volume (liters): ≈ 3 ½ gals

Sample ID: MW-02A Sample Time: ______ QA/QC: None

Sample Parameters: VOC's

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1410	6.88	14.29	0.886	10.51	63	121.8	460	46.22
1415	6.76	16.30	0.881	9.43	64	145.4	320	49.61
1420	6.76	16.88	0.894	8.02	64	146.9	300	At Pump
		~~dewatered well at slowest rate the~~						
		grundfos would pump - went to						
		a bailer to finish the purge						
1432	6.88	16.70	1.056	8.09	>1000	134.1	—	—
1436	6.68	16.03	1.028	5.13	>1000	131.4	—	—
			well bailed dry. Total water collected					
			up to now is ≈ 3½ gallons.					
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

54.10
33.01
21.09

2109
617
14763
2109
12654
1301253

40
23
63

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

MW-02A has ≈ 2½' stickup. "2A" barely visible. This well is about 12' south of MW-02.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-03

Date: 7/9/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint NO WELL CONST. details on Log

Measuring Point: Below Top of Riser Initial Depth to Water: 30.25 Depth to Well Bottom: 38.25 / 8.00 Well Diameter: 2" Screen Length: ?

Casing Type: PVC Volume in 1 Well Casing (liters): 4.94 LITERS Estimated Purge Volume (liters): _____

Sample ID: MW-03 Sample Time: 1455 QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1435	8.07	17.14	0.709	7.41	359	-351.7	630	30.28
1440	8.03	14.62	0.672	6.32	23.8	-352.2	620	30.28
1445	7.85	15.13	0.682	6.17	14.5	-346.8	650	30.27
1450	7.79	15.32	0.686	6.16	12.5	-347.4	640	30.28
1455	7.76	15.28	0.686	6.14	10.9	-348.6	680	30.28
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Pump set 5' Above bottom

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-06

Date: 7/11/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: POE Pump/Tubing Inlet Location: Screen midpoint 40-55'

Measuring Point: Below Top of Riser Initial Depth to Water: 25.65 Depth to Well Bottom: 42.6 V. Soft AT Bottom 16.95 Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): 10 LITERS Estimated Purge Volume (liters): 11 LITERS

Sample ID: MW-06 Sample Time: 1312 QA/QC: None

Sample Parameters: VOC's

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	
1245	7.93	16.69	0.886	3.74	897	-374.0	~~370~~	~~28.30~~	28.55
1250	8.25	18.29	0.919	3.04	>1000	-367.3	~~400~~	~~28.84~~	~~28.84~~
1255	8.20	19.19	0947	2.35	>1000	-371.1	~~390~~	~~28.74~~	~~28.74~~
1300	8.18	19.28	0.919	0.62	>1000	-395.4	~~395.8~~	28.65	
1305	8.15	19.38	0874	0.43	>1000	-398.5	500	29.15	
1310	8.12	19.21	0832	0.62	>1000	-399.2	500	29.41	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

Pump 7' from soft bottom - Heavy Silt came in around 1253 & WP CONTINUED Till The end.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-07

Date: 8/28/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos pump Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 22.65 Depth to Well Bottom: 32.84 Well Diameter: 2" Screen Length: 25-40 15'

~~2.19~~ 10.19

Casing Type: PVC Volume in 1 Well Casing (liters): ~~12~~ 6.28L Estimated Purge Volume (liters): 7 gals

Sample ID: MW-07 Sample Time: 1158 QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1120	6.93	12.03	0.544	11.53	688	120.3	1040	22.67
1125	6.47	13.81	0.585	9.61	245	97.6	500	22.67
1130	6.41	14.53	0.603	9.38	134	85.1	610	22.67
1135	6.37	14.68	0.608	9.34	57	82.4	510	22.67
1140	6.34	14.62	0.609	9.35	36	84.4	510	22.68
1145	6.31	14.49	0.608	9.43	39	88.5	600	22.68
1150	6.31	14.48	0.608	9.37	27	83.9	620	22.68
1155	6.30	14.42	0.607	9.38	23	85.0	610	22.68
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

32.84
22.65
10.19

10.19
6.17
7.126
1.089
6.11
62.87 16

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-09

Date: 7/8/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: GRUNFOS . Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint (20-35')

Measuring Point: Below Top of Riser Initial Depth to Water: 23.51 Depth to Well Bottom: 35.80 / 12.29' Well Diameter: 2" Screen Length: 15'

Casing Type: PVC Volume in 1 Well Casing (liters): 7.58 LITERS Estimated Purge Volume (liters): 4 gals

Sample ID: MW-09 Sample Time: 1955 QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1940	8.27	16.76	0.852	3.02	>1000	-383.2	1020	23.97
1945	7.48	14.10	0.822	1.09	364	-379.0	720	23.75
1950	7.38	15.11	0.843	0.93	218	~~-388.8~~	730	23.75
1955	7.35	15.12	0.842	0.84	14.8	-390.0	720	23.75
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-10

Date: 7/9/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint (15-30')

Measuring Point: Below Top of Riser Initial Depth to Water: 21.43 Depth to Well Bottom: 32.61 / 11.18 Well Diameter: 2" Screen Length: 15'

Casing Type: PVC Volume in 1 Well Casing (liters): 6.9 LITERS Estimated Purge Volume (liters): 5 gals

Sample ID: MW-10 Sample Time: 1246 QA/QC: None

Sample Parameters: VOC's

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1215	7.76	16.03	0.482	6.73	>1000	-359.9	~~870~~ 970	21.45
1220	7.64	12.36	0.461	3.66	947	-361.8	970	21.45
1225	7.56	14.06	0.479	5.18	941	-355.4	750	21.44
1230	7.49	13.91	0.481	3.96	295	-358.4	550	21.44
1235	7.41	14.01	0.483	3.47	171	-357.6	550	21.44
1240	7.45	14.84	0.492	3.46	89.1	-361	430	21.45
1245	7.44	14.54	0.488	3.41	35.8	-356.9	560	21.45
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

← stopped pumping cleaned out flow cell - restarted

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-11

Date: 7/11/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint 25-40

Measuring Point: Below Top of Riser Initial Depth to Water: 24.38 Depth to Well Bottom: 39.43 / 15.05 Well Diameter: 2" Screen Length: 15'

Casing Type: PVC Volume in 1 Well Casing (liters): 9.3 LITERS Estimated Purge Volume (liters): 27 LITERS

Sample ID: MW-11 Sample Time: 1104 QA/QC: ~~AQA~~ RINSE BLANK at 1011

Sample Parameters: VOC's WATER poured over pump.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1023	7.72	17.30	0.824	5.77	>1000	-351.8	830	24.61
1025	8.00	17.60	0.866	5.34	>1000	-348.3	630	24.61
1030	8.05	18.34	0.893	5.32	769	-341.6	710	24.61
1035	8.04	18.67	0.914	5.22	525	-338.2	660	24.61
1040	8.00	18.78	0.923	5.18	487	-335.1	640	24.54
1045	7.96	18.90	0.927	5.15	80.1	-331.7	700	24.55
1050	7.93	18.73	0.925	5.21	37.8	-329.1	680	24.54
1055	7.89	18.62	0.924	5.10	39.8	-329.5	680	24.54
1100	7.18	18.69	0.922	5.10	33.6	-329.9	680	24.54
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

LATE

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Pump set 7' above bottom

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-14

Date: 7/9/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/ Sampling Device: GRUNDFOS Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

NO well const. DATA on log

Measuring Point: Below Top of Riser Initial Depth to Water: 22.37 Depth to Well Bottom: 32.40 / 10.03 Well Diameter: 2" Screen Length: ?

Casing Type: PVC Volume in 1 Well Casing (liters): 6.19 LITERS Estimated Purge Volume (liters): ≈4 gals

Sample ID: MW-14 Sample Time: 1345 QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1330	8.24	16.26	0.612	8.99	750	-344.1	750	22.37
1335	7.76	13.88	0584	8.42	73.1	-349.9	840	22.37
1340	7.66	13.88	0.581	8.63	26.3	-347.4	840	22.36
1345	7.58	13.84	0.581	8.71	15.0	-346.7	840	22.36
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Pump ~~bottom~~ set ≈ 4' off bottom. This is the infamous "Flower Pot" well.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-15

Date: 7/9/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint 25-40

Measuring Point: Below Top of Riser Initial Depth to Water: 24.47 Depth to Well Bottom: 39.60 / 15.13 Well Diameter: 2" Screen Length: 15'

Casing Type: PVC Volume in 1 Well Casing (liters): 9.34 LITERS Estimated Purge Volume (liters): ≈ 4 gal

Sample ID: MW-15 Sample Time: 2022 QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	
1950	8.53	12.87	0.581	9.41	>1000	-353.7	760	25.20	
1955	8.21	13.57	0.589	8.90	>1000	-355.0	760	25.22	
2000	8.14	14.33	0.602	9.09	>1000	-350.7	850	25.15	RATE ↓
2005	8.01	14.03	0.608	8.84	180	-346.7	720	25.13	
2010	7.99	14.29	0.610	8.92	134	-342.9	660	25.09	
2015	7.97	14.33	0.616	8.83	72.6	-340.4	640	25.09	
2020	7.97	14.34	0.614	8.80	41.4	-338.2	640	25.09	
									STARTED TO RAIN AT 2021
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Pump raised 6' above bottom of well.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-16

Date: 7/10/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 22.60 Depth to Well Bottom: 39.92 / 17.32 Well Diameter: 2" Screen Length: NO DATA on log ! ?

Casing Type: PVC Volume in 1 Well Casing (liters): ~~39.92~~ 10.7 LITERS Estimated Purge Volume (liters): 15 LITERS

Sample ID: MW-16 Sample Time: 2008 QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1940	6.71	14.02	0.524	9.28	~~3000~~ 745.8	-337.6	520	22.85
1945	8.01	1373	0.571	8.40		-349.6	600	22.78
1950	8.06	14.43	0.589	8.79	21.3	-342.1	600	22.78
1955	7.88	14.45	0.590	8.26	8.23	-350.5	590	22.75
2000	7.90	14.51	0.592	8.92	7.54	-347.9	590	22.75
2005	8.02	1447	0.594	8.94	7.23	-347.0	590	22.75
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

— changed WATER IN 45s

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-17

Date: 7/10/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint 30-45'

Measuring Point: Below Top of Riser Initial Depth to Water: 29.94 Depth to Well Bottom: 43.22 / 13.28 Well Diameter: 2" Screen Length: 15'

Casing Type: PVC Volume in 1 Well Casing (liters): 8.2 LITERS Estimated Purge Volume (liters): 23 LITERS

Sample ID: MW-17 Sample Time: 1718 / ~~1818~~ QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1640	7.39	14.50	0.687	4.59	>1000	-362.6	~~360~~ 600	28.95
1645	7.36	14.78	0.692	5.02	>1000	-357.4	660	28.95
1650	6.95	15.67	0.702	5.85	>1000	-346.6	670	28.95
1655	6.48	15.53	0.696	6.49	>1000	-341.8	700	28.95
1700 ~~1800~~	6.27	15.64	0.698	6.67	871	-338.5	650	28.95
1705 ~~1805~~	6.58	15.56	0.697	7.87	764	-342.4	~~650~~ 650	28.95
1710 ~~1810~~	6.48	15.65	0.702	6.92	519	-337.2	650	28.95
1715 ~~1815~~	6.46	15.68	0.708	6.90	495	-336.0	650	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Rate ↓

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-18

Date: 7/10/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos. Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 20.20 Depth to Well Bottom: 22.80 Well Diameter: 2" Screen Length: 20.-35 15

Casing Type: PVC Volume in 1 Well Casing (liters): 1.6 LITERS Estimated Purge Volume (liters): 12 LITERS

Sample ID: MW-18 Sample Time: 1912 QA/QC: none

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1850	7.63	15.45	0.614	9.50	44.4	-357.0	620	20.20
1855	8.13	14.55	0.609	8.42	15.6	-351.2	600	20.20
1900	8.09	14.55	0.608	8.39	7.84	-347.0	610	20.20
1905	8.08	14.63	0.609	8.37	5.62	-344.2	590	20.20
1910	8.08	14.81	0.610	8.35	4.30	-343.7	550	20.20
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Almost all of Screen silted in. Pump set 6" above bottom.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-19

Date: 7/10/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint (25-40')

Measuring Point: Below Top of Riser Initial Depth to Water: 24.01 Depth to Well Bottom: 39.0 (14.99) Well Diameter: 2" Screen Length: 15'

Casing Type: PVC Volume in 1 Well Casing (liters): 9.2 LITERS Estimated Purge Volume (liters): 15.5 LITERS

Sample ID: MW-19 Sample Time: 1428 QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)	
1410	8.10	14.95	0.608	1.17	865	-400.5	590	26.01	
1415	7.89	15.83	0.628	0.78	737	-394.9	580	26.27	
1420	7.64	16.23	0.639	0.48	731	-397.1	420	26.46	
1425	7.45	16.83	0.626	0.34	942	-397.6	330	26.64	RATE ↑
1430	7.43	16.87	06.14	0.32	691	398.2	720	26.71	
1435	7.39	16.92	0.615	0.29	>1000	397.6	470	26.84	
1440	7.47	17.01	0.608	0.28	>1000	398.6	460	26.92	
1445	7.48	17.14	0.610	0.28	>1000	397.7	420	26.93	
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---		

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

Pump set 7' above bottom.

RATE keeps dropping ~~DTW~~ + DTW keeps falling. Turb. unsteady

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-20

Date: 7/8/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos - Tubing Type: ~~Poly~~ LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 27.34 Depth to Well Bottom: 37.65 / 10.31 Well Diameter: 2" Screen Length: 35-40' 5

Casing Type: PVC Volume in 1 Well Casing (liters): 6.36 Liters Estimated Purge Volume (liters): 5 gals

Sample ID: MW-20 Sample Time: 1855 QA/QC: Norm

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1825	7.81	13.64	0.742	9.95	>1000	-329.3	690	29.19
1830	7.70	14.60	0764	9.56	>1000	-330.9	570	29.02
1835	7.52	15.39	0.775	9.54	>1000	-329.4	560	28.71
1840	7.46	15.41	0.775	9.52	>1000	-328.9	560	28.71
1845	7.38	15.33	0772	9.49	284	-328.4	560	28.71
1850	7.36	15.28	0771	9.48	98.1	-327.3	550	28.71
1855	7.35	15.24	0769	9.48	44.7	-326.9	550	28.70
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-21

Date: 7/9/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: GRUNDFOS Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint NO WELL CONSTRUC. DATA on log

Measuring Point: Below Top of Riser Initial Depth to Water: 31.58 Depth to Well Bottom: 35.46 / 3.88' Well Diameter: 2" Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): 2.40 LITERS Estimated Purge Volume (liters): 2 gals

Sample ID: MW-21 Sample Time: 1618 QA/QC: DUPLICATE 20080709-FD-1

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1550	7.44	15.71	0.789	9.92	>1000	-352.0	—	32.30
1600	8.20	18.20	0.854	6.95	—	-340.0	440	32.58
1605	8.18	18.12	0.852	6.86	478	~~-340~~ -338.4	370	~~33.50~~ 33.15
1610	8.12	18.15	0.861	6.71	37.7	~~-370~~ -336.2	280	33.41
1615	8.14	18.48	0.882	6.60	26.4	-334.4	~~X~~ 240	33.55
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Could only pump at a very low rate or the well went dry. Duplicate 20080709-FD-1 TAKEN from this well

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-22

Date: 7/10/08 Sampling Personnel: Tom Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: 4 ~~5~~' off Bottom Screen midpoint 15-30

Measuring Point: Below Top of Riser Initial Depth to Water: 25.76 Depth to Well Bottom: 32.00 Well Diameter: 2" Screen Length: 15'

6.24

Casing Type: PVC Volume in 1 Well Casing (liters): 3.85 LITERS Estimated Purge Volume (liters): 5 gals

Sample ID: MW-22 Sample Time: 1027 QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1000	7.99	19.88	1.223	4.39	406	-361.0	780	25.86
1005	8.09	20.92	1.245	3.50	177	-357.3	760	25.87
1010	8.03	21.17	1.235	2.05	31.4	-357.6	800	25.88
1015	8.00	21.26	1.234	1.88	14.0	-359.0	800	25.87
1020	7.99	21.23	1.228	1.86	8.26	-357.2	790	25.87
1025	7.97	21.17	1.226	1.84	6.22	-356.7	800	25.87
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-25

Date: 7/9/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 8.32 Depth to Well Bottom: 24.21 / 15.9 Well Diameter: 2" Screen Length: NO WELL CONSTRUCTION DATA ON LOG ?

Casing Type: PVC Volume in 1 Well Casing (liters): 9.8 LITERS Estimated Purge Volume (liters): 21 LITERS (5 Eq)

Sample ID: MW-25 Sample Time: 1748 QA/QC: MS / MSD

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1720	7.28	14.81	0.771	9.74	>1000	-343.2	780	~~780~~ 8.62
1725	7.94	14.18	0.757	9.11	200	-351.4	970	8.62
1730	7.78	14.49	0.764	9.06	70.2	-350.3	730	8.58
1735	7.71	14.58	0.766	9.06	43.2	-349.8	870	8.58
1740	7.68	14.63	0.767	9.05	27.9	-349.4	870	8.58
1745	7.68	14.62	0.765	9.05	28.7	-349.2	870	8.58
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Pump placed 7' off bottom

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-26

Date: 7/9/08 Sampling Personnel: Tom Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 13.98 Depth to Well Bottom: 27.00 (13.02) Well Diameter: 2" Screen Length: No well construction info. Just boring log set

Casing Type: PVC Volume in 1 Well Casing (liters): 8 LITERS Estimated Purge Volume (liters): 3 Gals

Sample ID: MW-26 Sample Time: 1135 QA/QC: None

Sample Parameters: VOCs

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1117	8.59	11.26	0.188	8.57	—	-341.6	1020	14.55
1120	8.04	11.21	0.190	7.72	81.3	-350.2	620	14.52
1125	7.72	11.87	0.193	7.65	71.3	-349.5	570	14.52
1130	7.53	11.79	0.191	7.67	37.5	-349.0	620	1455
1135	7.43	11.72	0.190	7.65	23.4	-348.5	620	14.53
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks: Obstruction in well ≈ 24.5' bg. Bailer?. Pump set 1' above bailer. Depth gauge gets past obstruction, however.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-27

Date: 7/8/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: ~~Poly~~ LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 26.76 Depth to Well Bottom: 32.06 Well Diameter: 2" Screen Length: no log

5.30 x 617 = 3.27 L

Casing Type: PVC Volume in 1 Well Casing (liters): 3.27 L Estimated Purge Volume (liters): 4.5 gals

Sample ID: MW-27 Sample Time: 1450 QA/QC: none

Sample Parameters: _____

NOTE: Pump will not run less than 820 mL/min

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1423	7.07	14.82	4.31	9.45	>1000	102.0	820	~~27.80~~
1427	7.05	14.97	4.33	9.08	>1000	100.1	820	27.91
1433	6.88	15.34	4.238	8.81	>1000	170.4	600	27.99
1436	6.90	15.82	4.235	8.69	>1000	176.6	600	28.04
1441	6.88	15.80	4.168	8.83	>1000	178.3	520	28.01
1446	6.90	15.90	4.136	8.83	>1000	179.6	500	28.00
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Hillcrest Site: _____ Well I.D.: MW-28R

Date: 7/11/08 Sampling Personnel: John Boyd Company: URS Corporation

Purging/Sampling Device: Grundfos Tubing Type: LDPE Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: 22.60 Depth to Well Bottom: 30.50 Well Diameter: 2" Screen Length: No Log. 10?

7.9

Casing Type: PVC Volume in 1 Well Casing (liters): 4.9 Liters Estimated Purge Volume (liters): 28 Liters

Sample ID: MW-28R Sample Time: 0935 QA/QC: None

Sample Parameters: VOC's

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0845	7.75	12.64	0.775	1.49	>1000	-399.3	510	22.65
0850	7.10	13.68	0.796	1.48	>1000	-390.9	550	22.65
0855	8.07	13.62	0.799	1.56	>1000	-388.3	620	22.65
0900	8.03	13.66	0.802	1.66	>1000	-387.1	620	22.65
0905	8.00	13.76	0.806	1.71	>1000	-385.2	620	22.65
0910	7.96	13.57	0.803	1.76	637	-384.0	630	22.65
0915	7.90	13.64	0.806	1.79	324	-382.8	630	22.66
0920	7.89	13.66	0.806	1.80	118	-382.0	610	22.65
0925	7.88	13.75	0.808	1.81	66.5	381.7	610	22.65
0880	7.87	13.73	0.807	1.81	47.3	-381.1	610	22.65
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES–0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

Pump set 5' off the bottom.

APPENDIX D

SURVEY DATA

TABLE
NYSDEC HILLCREST - BINGHAMTON, NEW YORK
SURVEY DATA

Location ID	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Measuring Point/Riser Elevation (ft)
GS-01	783684.1629	1010237.9866	898.867	NA	NA
GS-02	783810.3985	1010300.6692	899.832	NA	NA
GS-03	784018.9014	1010382.0716	899.614	NA	NA
GS-04	784190.4148	1010453.9846	899.614	NA	NA
GS-05	784486.3479	1010561.2034	897.952	NA	NA
GS-06	784667.6433	1010645.6546	898.054	NA	NA
GS-07	784990.4340	1010771.3264	897.253	NA	NA
GS-08	785317.3780	1010148.0590	892.715	NA	NA
GS-09	783952.2375	1010290.0500	899.806	NA	NA
GS-10	783843.6526	1010020.4992	901.534	NA	NA
GS-11	783753.6637	1010216.6351	901.671	NA	NA
GS-12	784103.0491	1010105.3142	903.147	NA	NA
GS-13	782318.3537	1008357.4564	894.202	NA	NA
GS-14	783946.5481	1009896.9241	902.862	NA	NA
GS-15	782372.6265	1008994.9211	892.231	NA	NA
GS-16	785219.7085	1010505.4186	895.623	NA	NA
GS-17	785518.2287	1009144.0024	866.303	NA	NA
GS-18	784337.9940	1008410.6039	854.958	NA	NA
GS-19	785205.3865	1009187.1753	890.363	NA	NA
GS-20	782713.9995	1008856.9467	894.100	NA	NA
GS-21	782734.2616	1008407.5902	898.078	NA	NA
GS-22	784711.1181	1008597.3917	853.209	NA	NA
GS-23	784925.7322	1009724.8327	894.427	NA	NA
GS-24	785251.6767	1008834.1634	854.155	NA	NA
GS-25	785106.8228	1009338.5515	890.075	NA	NA
GS-26	785523.4437	1009457.1716	892.945	NA	NA
GS-27	785403.6507	1009842.2105	893.986	NA	NA
GS-28	785949.0108	1009169.9329	857.469	NA	NA
MW-07-01	783852.3728	1010301.0847	899.210	899.21	898.94
MW-07-02	784666.8184	1010644.8491	898.120	898.12	897.81
MW-07-03	785056.7805	1010587.3720	898.900	898.90	898.58
MW-07-04	784104.0410	1010105.6539	903.220	903.22	902.79
MW-07-05	784388.9526	1009963.7687	904.950	904.95	904.72
MW-07-06	784227.3145	1009679.0257	904.050	904.05	903.76
MW-07-07	785405.0342	1009840.5590	894.010	894.01	893.75
MW-07-08	784830.8906	1009599.5579	895.880	895.88	895.66
MW-07-09	784711.9240	1008598.1021	853.330	853.33	853.03
MW-07-10	785289.0355	1008837.5839	856.880	856.88	856.40
MW-07-11	785744.5511	1009121.4373	857.570	857.57	857.12
MW-28R	783673.1878	1009923.4735	901.500	901.50	900.93

APPENDIX E

EMPIRE SOILS INVESTIGATIONS INC.

PRELIMINARY HYDROGEOLOGIC STUDY

TOWN OF FENTON WATER SUPPLY WELLS

MARCH 1985

EMPIRE
SOILS INVESTIGATIONS INC.

PRELIMINARY HYDROGEOLOGIC STUDY
TOWN OF FENTON WATER SUPPLY WELLS
TOWN OF FENTON, NEW YORK

FOR
Town of Fenton

Job No. GTA-84-110
February 1985
Revised March 1985

R2
105 CORONA AVENUE, GROTON, NY 13073, 607-898-5881

TABLE OF CONTENTS

THOMSEN ASSOCIATES

PRELIMINARY HYDROGEOLOGIC STUDY
TOWN OF FENTON WATER SUPPLY WELLS
TOWN OF FENTON, NEW YORK

1.0 INTRODUCTION

1.1 Purpose and Scope

Thomsen Associates was retained by the Town of Fenton to perform a hydrogeologic study on their water supply wells. The purpose of the study was to evaluate the impacts on the Town wells of the proposed I-88 realignment and future mining in the gravel pits north and west of the Town wells. This preliminary report presents the results and conclusions from our first step of the investigation, data collection and evaluation. The results and conclusions presented in this preliminary report were based on an evaluation of the data from the sources listed in Appendix A, References. No field data was collected during the study.

This report was prepared for the exclusive use of the Town of Fenton for specific application to their water supply wells. No other warranty, expressed or implied, is made.

1.2 Location

The Town wells are located in the Town of Fenton, approximately 100 feet east of Route 7. (Drawing 1) They are located on a narrow river terrace 1500 feet east of the Chenango River. The terrace is about 20 feet above the flood plain of the river. East of the wells a steep bank slopes up to a second terrace 25 feet above the Town wells.

1.3 Methodology

Available data on site geology and hydrogeology were gathered and evaluated to determine the hydrogeologic setting. Information on the Town wells, well construction, depth, and capacity was also reviewed. In addition, drawings showing the proposed realignment and mining plans for the area north and west of the Town wells were examined.

2.0 FINDINGS OF INVESTIGATION

2.1 Hydrogeologic Setting

The Chenango River Valley is filled with over 200 feet of unconsolidated silts, clays, sands and gravels in the vicinity of the Town of Fenton wells. (See Drawing 2) These deposits occupy a deep valley carved into bedrock during the last glacial advance. As the glaciers retreated, thick deposits of sands and gravels and silts and clays filled in the deep valley left by the glaciers. Drawing 2 is a generalized cross section through the Chenango River Valley in the vicinity of the Town wells which illustrates the types of sediments found in the valley. This drawing was developed based on boring logs from Randall (1972). It should be noted that the geology depicted east of the Town wells is schematic. There were no wells or borings to provide information on subsurface conditions in this area.

The surficial deposits in the Chenango River Valley are outwash sands and gravels. The sands and gravels are 25 to 30 feet thick in the vicinity of the Town wells. The sand and gravel outwash deposits are

mined from the gravel pits north and west of the Town wells. The bottom of the upper sand and gravel layer is between elevation 810 and 820 west of the wells. Below the surficial sands and gravels is a layer of silts and clays which is over 100 feet thick beneath the Town wells. The silts and clays were deposited in lakes formed in front of the glacier as it retreated northward. The boring log for Town well #1 indicates the silts and clays extend from below the sand and gravel to elevation 700. However, as shown on the cross section (Drawing 2) the silt and clay deposits are not continuous across the valley.

Waller and Finch (1982) and MacNish and Randall (1982) state that isolated discontinuous silt and clay deposits are found within the outwash sands and gravels throughout the Chenango Valley. These smaller isolated lake deposits are shown on the cross section west of the major silt and clay deposit beneath the Town wells.

Below the silts and clays are more outwash sands and gravels. The Town wells obtain their water from this deep sand and gravel aquifer. The deep sands and gravels are partially confined by the overlying silt and clay deposits. However, since the silts and clays are not continuous they only provide partial confinement to the underlying sand and gravel aquifer. The hydrologic connection between the upper sand and gravel layer and the partially confined deep sand and gravel aquifer which supplies water to the Town wells is shown by water level data (Table 1). In 1977 water levels were measured in the Town wells and an observation well on the Boland

property which is west of the Town wells (Hawk Engineering, 1977). During September 1977 the water levels in both the Town wells and the shallow observation well rose 4 feet in response to 2 weeks of heavy rain. The rapid response of the deep Town well to the increased recharge in the surficial sands and gravels indicates a hydrologic connection between the surficial sands and gravels and the deep sand and gravel aquifer. As shown on the cross section, the silt and clay deposit partially confining the deeper sands and gravels thins toward the Chenango River, allowing a hydrologic connection between the surficial sand and gravel deposits and the deeper semi-confined sands and gravels.

The water level data indicate that the deeper sand and gravel deposit is recharged by the surficial sands and gravels and the Chenango River. The water levels in the Town wells were consistently below the water level measured in the Boland observation well, indicating recharge from the shallow sand and gravel deposits toward the deeper sand and gravel aquifer. However, it should be noted that water elevations shown on Table 1 for the Town Wells are approximate; exact elevations have not been determined.

2.2 Aquifer Characteristics

As described in Section 2.1 the aquifer used by the Town wells is a deep partially confined sand and gravel aquifer. Drawdown information obtained by Hawk Engineers in 1977 and available well construction information were used to estimate aquifer properties. Unfortunately, the information on well construction is not consistent. Available information on well construction data is summarized in Table 2.

TABLE 2

Summary of Well Construction Data

Well	Source of Data	Total Depth	Depth to Bottom of Casing	Casing Diameter
1	Rules & Regulations of Water District 1929	219'	169'	16"
	Letter to Moody & Chamberlain Attorneys 1952	204'	-	-
	Specifications for Well #3 1959	209'	159'	16"(0' to 151') 10"(151' to 159')
	USGS Bulletin 69	219'	-	16"
2	Rules & Regulations of Water District 1929	219'	-	16"
	Letter to Moody & Chamberlain Attorneys 1952	204'	-	-
	Specifications for Well #3 1959	222'	176'	16"(0' to 163') 10"(163' to 176')
	USGS Bulletin 69	199'	163'	10"
3	Specifications for Well #3 1959	210'	150'	16"
	USGS Bulletin 69	168'	152'	17"

In estimating aquifer properties it was assumed that well #2 fully penetrated the deep sand and gravel aquifer, and was screened from 169 feet to 219 feet below the ground surface. A casing diameter of 16 inches was used in calculations. Well #3 was assumed to partially penetrate the aquifer (well screen = 16 feet, aquifer thickness = 80 feet) with a casing diameter of 17 inches.

Well discharge formulas for equilibrium conditions for both artesian and unconfined aquifers were used to estimate the hydraulic conductivity of the aquifer. (Johnson, 1975). The drawdown and pumping rate data obtained by Hawk Engineers in 1977 were used to estimate hydraulic conductivity of the aquifer for wells #2 and #3. Data from well #1 was not used because the drawdown data indicated the well screen was clogged. If the aquifer is assumed to be a water table aquifer, the calculated permeability and transmissivity is lower than if it is assumed to be confined. (Table 3).

TABLE 3

Summary of Aquifer Characteristics

			Hydraulic Conductivity (gpd/ft^2)		Hydraulic Conductivity cm/sec		Transmissivity (gpd/ft)	
Well	Q(gpm)	Drawdown (ft.)	Water Table	Confined	Water Table	Confined	Water Table	Confined
2	250	11	130	480	$6x10^{-3}$	$2x10^{-1}$	6,500	24,000
3	850	8 (3.7)*	560	3000	$3x10^{-2}$	$1x10^{-1}$	45,000	240,000

*Drawdown corrected for partial penetration.

As shown on Table 3 the hydraulic conductivity and transmissivity of the aquifer at well #3 is greater than at well #2. The USGS (Randall, 1972) indicated that well #2 had a drawdown of 15 feet at a pumping rate of 510 gpm, which would result in a hydraulic conductivity of 718 gpd/ft^2 and transmissivity of 36,000 gpd/ft for a confined aquifer.

2.3 Proposed Actions

2.3.1 Gravel Pit Mining

The mining plans for the Barrett-Boland-Corbisello Quarries show that the majority of the area between the Town wells and the Chenango River west of the Brandywine Highway will be mined, and about 30 feet of gravel will be removed. The mined area will be left as a pond. Mining will essentially remove all the sand and gravel above the lacustrine silts and clays. Dewatering is not proposed for the mining operation so groundwater elevations in the surficial sand and gravel deposits should be relatively unaffected by the mining operations.

2.3.2 Proposed I-88 Realignment

The proposed realignment for I-88 in the vicinity of the Town wells includes a crossover 800 feet south of the Town wells. The proposed elevation for I-88 below the crossover is 843, 10 feet below the existing grade. Since the 100 year flood elevation is 855, and normal groundwater elevations in the area are between 840 and 845, a pumping station is proposed to keep groundwater and flood levels below the road grade. It is assumed the pumping station will maintain water levels at elevation 840.

2.4 Impacts of Proposed Actions on Quantity of Water

2.4.1 Gravel Pit Mining

The proposed mining plans should have little impact on the quantity of water available at the Town wells. The Town wells are obtaining water from the deep sand and gravel aquifer which is recharged from the

shallow sand and gravel deposits and the Chenango River. The amount of water available to recharge the deeper aquifer should not be significantly affected by the mining since no dewatering is proposed.

2.4.2 Proposed I-88 Realignment

The proposed pumping station 800 feet south of the Town wells should have little impact on the quantity of water available from the wells. The existing groundwater elevation fluctuates around elevation 840. Maintaining groundwater elevations at elevation 840 in this area should not affect recharge to the Town wells. Recharge to the deep aquifer occurs from the sand and gravel deposits west of the wells. Recharge from this area should not be affected by the proposed pumping station.

2.5 Impacts of Proposed Actions on Water Quality

2.5.1 Gravel Pit Mining

The mining operation is not expected to have any direct impacts on water quality or the Town wells. Any increased turbidity in groundwater caused by mining in the surficial sand and gravel aquifer would be filtered out by the intervening deposits before reaching the Town wells. However, the proposed mining operation could have indirect impacts on water quality of the Town wells. The mining operation will remove most of the surficial sand and gravel deposits between Brandywine Highway and the river, leaving a deep lake in their place. The confining layer of silts and clays beneath the sand and gravel deposit is thin in this area and may not be continuous. Removing the sand and gravel and leaving a large lake in

its place increase the potential for contamination from a chemical spill in the river, lake or along the highway reaching the Town wells. The water level data indicate there is a hydraulic connection between the deep sand and gravel aquifer and the shallow sand and gravel deposits. The sand and gravel deposits provide some attentative capacity (ability to filter out contaminants). Removing these deposits slightly increases the potential for any contaminants in the river, or spilled into the lakes in the gravel pits, to reach the deeper sand and gravel deposits.

2.5.2 Proposed I-88 Realignment

The proposed I-88 realignment could have an affect on water quality in the Town wells. Studies by Bellinger et. al. (1982), Roth and Wall (1976), Field et. al. (1974) and the USEPA (1974) all show that de-icing salts used on highways increase the chlorides content of groundwater in the vicinity of highways. The USEPA (1974) study reported that there were 3 documented cases of public water supply wells contaminated by road salt in the northeast where the wells were between 100 and 1,000 feet from the road and one documented case where the water supply well was over 1,000 feet from the well. In addition, three of the public water supply wells with documented contamination were over 100 feet deep. The USEPA report (1974) states "It should be noted that in many of these instances [of documented road salt-contamination to groundwater], the pollutant had travelled several thousand feet from source to the affected well and had penetrated to depths of more than 100 feet, actually to almost 400 feet in a few wells" (USEPA, 1974, p. 197).

The Town of Fenton wells are only 100 feet from the edge of the proposed highway. Although they are upgradient of the highway, pumping by the Town wells creates a cone of depression which extends downgradient of the wells, changing the direction of groundwater flow. The impact on the Town of Fenton wells from road salt depends on several factors; amount of salt used on the highway, percentage of salt used which enters groundwater, interconnection between the surface sand and gravel deposits and the deep sand and gravel aquifer, and the zone of influence of the Town of Fenton wells. Although the aquifer properties needed to quantitatively evaluate the potential impacts of road salt on the Town wells can only be estimated, a preliminary assessment of whether road salt should be considered a potential threat to the Town wells can be performed using the estimated aquifer characteristics described in Section 2.2.

The zone of influence of the wells can be estimated using the equilibrium well formula (Johnson, 1975). Assuming an aquifer transmissivity of 24,000 gpd/ft., and a pumping rate of 250 gpm with 11 feet of drawdown, the zone of influence for well #2 is 67 feet. (See Section 2.2 for discussion of aquifer characteristics) However, increasing the transmissivity by a factor of 1.5 (and keeping the pumping rate and drawdown the same) the zone of influence for well #2 would increase to 670 feet. The zone of influence of the well is related logarithmically to the aquifer transmissivity so a small increase in aquifer transmissivity results in a correspondingly large increase in the zone of influence of the well.

Another way to evaluate the extent of the zone of influence of a well is through comparing reasonable values for leakage rates through the confining layer to pumping rates. The zone of influence of a pumping well will expand until there is sufficient leakage through the confining layer to equal the pumping rate. Under steady state conditions, the recharge rate to the surficial aquifer would be the same as the leakage rate through the confining layer. MacNish and Randall (1982) estimate the recharge rate to the surficial sand and gravel aquifer is 24 inches/ft^2/year. Assuming an average recharge rate of 2 ft/ft^2/year, and steady pumping rate of 360,000 gpd (250 gpm) the radius of infiltration would be about 1700 feet for well #2. A zone of influence of 1700 feet for well #2 appears to be a more reasonable estimate than 67 feet because water level measurements by Hawk Engineers in 1977 indicated a drawdown of 1 foot in well #1 which is located of 120 feet from well #2.

Given an estimated zone of influence of the pumping well, the leakage rate through the confining layer can be computed. Using a pumping rate of 360,000 gpd and assuming the radius of the zone of influence is 1700 ft., the infiltration through the confining layer would be 0.005 ft/day ($2x10^{-6}$cm/sec). The static vertical gradient between the surficial sand and gravel layer is estimated to be 3 ft/100 ft. Assuming an average drawdown of 4 ft., the vertical gradient will be 7 ft/100 ft. (.07 ft/ft). Assuming a vertical gradient of 0.07 ft/ft through the confining layer the vertical permeability of the silt and clay confining layer would

be 0.075 ft/day ($3x10^{-5}$cm/sec). If the zone of influence of the wells is smaller than 1700 feet, the leakage through the confining layer would have to be larger than .075 ft/day to produce 360,000 gpd of water from the wells. Given the type of deposits for the confining layer (silts and clays), a vertical permeability of 0.075 ft/day with a corresponding zone of influence of the well of 1700 ft. seems a reasonable estimate.

The amount of salt used per lane mile is estimated to be 10 tons/lane mile/per year in the Environmental Impact Statement (USDOT, 1983). Field et. al. (1974) estimate an application rate of 20 tons of salt/lane mile each winter. Using an application rate of 10 tons/lane mile, and assuming a zone of influence extending 1700 feet on either side of wells #1 and 3, approximately 28 tons of salt would be applied within the zone of influence of the three wells. If it is assumed that due to the permeability of the surficial sands and gravels, all of the salt applied enters the shallow groundwater system, approximately 56,000 lbs. of salt would enter the shallow groundwater system each year. The average daily pumping rate for all 3 wells during 1984 was 550,000 gallons (Hawk, verbal communication) If all of the salt entering the shallow sand and gravel aquifer within the zone of influence of the Town wells were to enter the deeper aquifer, and the Town wells are pumped at a rate of 550,000 gallons/day, the level of chlorides in the water would increase by approximately 30 ppm.

The drinking water standards for chloride are 250 ppm (NYDEC, 1978). Given background concentrations of 20-30 ppm chlorides in the well water, (Randall, 1972) any increase in chlorides should not exceed health standards. However, Field et. al. (1974) indicate that corrosion of well screens,casings and pumps can occur at chloride concentrations of only 40 to 50 ppm.

The above analysis is for worst case conditions. It should be noted that 1) salt is currently used along the Brandywine Highway so there will not be a net increase of 10 tons/lane mile in the vicinity of the Town wells and 2) not all salt applied to the road would enter the groundwater system.

There could be a slight net increase in salt used along the road because de-icing may be more aggressive along an interstate highway than along the Brandywine Highway. However, the net increase would be far less than 10 tons/lane mile. Additionally, not all the salt will enter groundwater. The proposed pumping station for the crossover should help minimize the amount of salt entering groundwater. The highway underdrain system will capture runoff from the highway and channel it to the pumping station, from where it will be pumped to the river. Although some salt runoff may enter the shallow groundwater system, we anticipate that the amount of salt entering the groundwater system will be less than that currently entering groundwater, due to the proposed underdrain system.

Another potential water quality impact from the proposed highway realignment on the Town of Fenton wells would be from spills of hazardous substances transported along the highway. If a tanker truck transporting hazardous substances were to spill these materials in the vicinity of the Town of Fenton wells, there would be a possibility of the hazardous substances reaching the Town of Fenton wells.

Since the same risk currently exits from spills along the Brandywine Highway, the impact of the new highway would depend on whether there was an increase in the number of tracks transporting hazardous substances.

3.0 CONCLUSIONS AND RECOMMENDATIONS

The Town of Fenton wells obtain groundwater from a deep buried sand and gravel aquifer. The sand and gravel aquifer is partially confined by over 100 feet of silt and clay in the vicinity of the Town wells. The confining layer of silt and clay is lenticular in shape and decreases in thickness east and west of the wells. The deep sand and gravel aquifer is recharged by a shallow sand and gravel aquifer found above the confining layer of silts and clays. The rapid response of water levels in the deep sand and gravel aquifer to changes in water levels in the surficial sand and gravel aquifer indicates a hydrologic connection between the two aquifers.

Pumping of the Town wells will induce recharge from the surficial aquifer into the deeper sand and gravel aquifer. A cone of depression will be formed by the Town wells which will extend outward away from the wells until recharge from the shallow sand and gravel aquifer through the silt and clay layer is equal to the amount pumped from the wells.

Neither the proposed I-88 realignment or future mining should affect the quantity of water available for the wells. The proposed pump stations for I-88 will maintain groundwater levels at elevation 840, which is close to the average groundwater elevation in the surficial sand and gravel deposit. Since the gravel pits will not be dewatered during mining, water levels in the shallow sand and gravel aquifer will not be significantly changed by mining.

However, water quality in the Town wells may be affected by the proposed I-88 realignment and mining operations. The sand and gravel mining will remove large quantities of gravel above the silt and clay layer and leave the area more exposed to contamination. Any contamination in the surficial water table would move more quickly into the deeper sand and gravel aquifer than if the sand and gravel were not taken out of the ground.

The worst case estimates indicate there could be a slight increase in chlorides at the Town wells. We do not think there will be a measurable increase in

chlorides due to 1) existing de-icing on the Brandywine and 2) the new underdrain should minimize infiltration of salt into the shallow groundwater system. Under worst case assumptions, concentrations of chlorides are expected to remain below water quality standards. A potential impact from road salt runoff entering groundwater could be a higher corrosion rate of the well casing, screen or pump if all the net increase in road salt entering groundwater is 10 tons/lane mile/year.

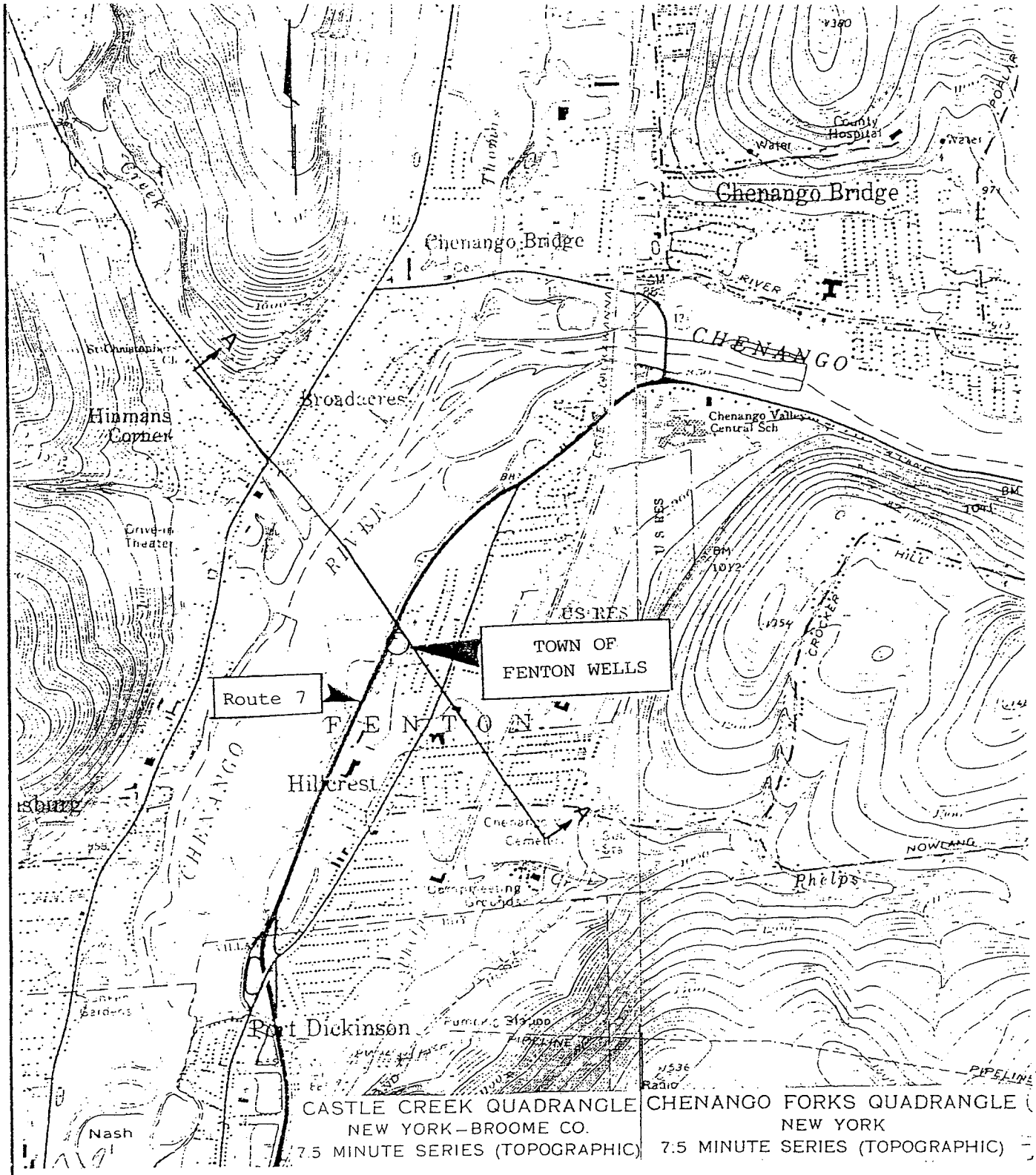
Quantifying the impacts of either mining or the proposed I-88 realignment on water quality is difficult without better definition of aquifer properties. In order to determine whether a measurable increase in chlorides concentrations at the Town wells will occur, the transmissivity of the aquifer and quantity of leakage through the confining layer of silt and clay must be known. Potential impacts from spills of hazardous substances along the highway also cannot be quantified without a better definition of aquifer properties. However, we think the assumptions used to estimate impacts were reasonable. A pumping test would provide the data to quantify potential impacts but we do not expect the conclusions discussed above would change.

Respectfully submitted,
EMPIRE-THOMSEN

Marjory B. Rinaldo-Lee

Marjory B. Rinaldo-Lee, C.P.G.S.

DRAWINGS



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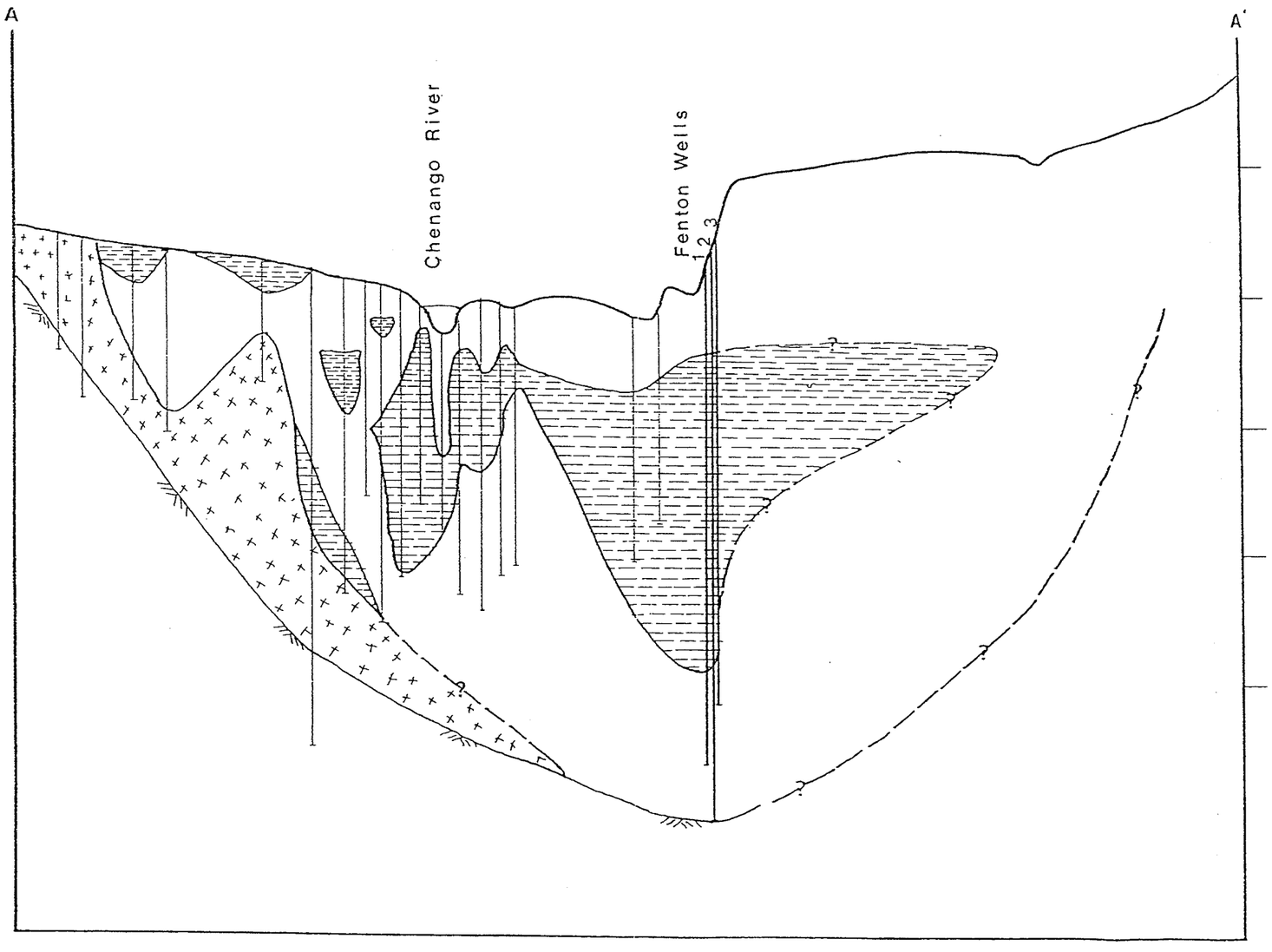
Groton ▪ Buffalo ▪ Rochester ▪ Syracuse ▪ Albany
New York ▪ Edison, New Jersey

SITE PLAN

FENTON WELLS

TOWN OF FENTON, NY

DR. BY:	SCALE: 1" = 2000'	PROJ. NO.GTA-84-110
CK'D. BY:	DATE: Jan 1985	DRWG. NO.: 1



KEY

- BORING or WELL
- SAND & GRAVEL
- SILTS & CLAYS
- GLACIAL TILL
- BEDROCK
- ?

SCALE: 1" ≈ 900' Horizontal
1" = 50' Vertical

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GENERALIZED CROSS-SECTION
FENTON WELLS
TOWN OF FENTON, NY

DR. BY: SC	SCALE: As Stated	PROJ. NO.: GTA-84-11	
CK'D BY:	DATE: Jan 1985	DRWG NO.: 2	