Project Borehole/Monitoring Well Logs for LPH Remediation
Former Landfill and Asphalt Plant (TC Site), Otter Creek
Happy Valley Goose Bay, Newfoundland and Labrador

APPENDIX C

BOREHOLE/MONITORING WELL LOGS

LOG OF 10-MW48-N4W0

PROJECT No.:	TV9423105	ELEVATION(masl):	2.36
CLIENT:	DCC/DND	DATUM:	Geodetic
PROJECT NAME:	Otter Creek Tank Farm Supplemental 2010	METHOD:	Hand Auger
LOCATION:	Goose Bay	DIAMETER(mm):	
DATE DRILLED:	7-29-10	WATER LEVEL(mbgs):	0.86
LOGGED BY:	AB	CONTRACTOR:	N/A

DEPTH (m)	ELEVATION (masl)	STRATIGRAPHIC DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm)	SAMPLES N-VALUE or RQD%	SAMPLES OVM (ppm)
0									
	1.75	**TOPSOIL** Brown sandy topsoil with roots, moist.			GR	1			110
1		**SAND** Brown, medium to coarse sand, wet; hydrocarbon odour observed.		▽	AU	—		—	—
	0.53				GR	2			450
2		**SAND** Grey, coarse sand, wet; hydrocarbon odour observed.			AU	—		—	—
					GR	*3			3000
3	-0.69	End of Borehole @ 3 m							

WELL CONSTRUCTION

Date Completed : 7-29-10

PROTECTIVE WELL CASING
- Material : N/A
- Diameter :
- Joints : N/A

WELL & PIPE SCREEN
- Material : Sch. 40 PVC
- Diameter : 50 mm
- Joints : Flush
- Opening : 10 Slot

SAND PACK : Native Sand

ANNULUS SEAL : Bentonite

NOTES:

The measuring point used is the top of the well casing, which has a geodetic elevation of 3.37masl.

On this log, the water level measurement and elevation have been adjusted to grade.

Stick up is 1.01m above ground surface.

*Submitted for laboratory analysis.

Borehole was advanced to 3.0mbgs, however, due to cave in, the well installation was completed to 1.9m.

LOG OF TC11-MW30

PROJECT No.:	TF11076411	ELEVATION(m):	2.82
CLIENT:	PWGSC	DATUM:	Geodetic
PROJECT NAME:	Otter Creek LPH	METHOD:	Hand Auger
LOCATION:	Goose Bay	DIAMETER(mm):	102
DATE DRILLED:	11-21-11	WATER LEVEL(mbgs):	1.45
LOGGED BY:	CP/SA	CONTRACTOR:	AMEC

DEPTH (m)	ELEVATION (masl)	STRATIGRAPHIC DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm)	SAMPLES N-VALUE or RQD%	SAMPLES OVM (ppm)
0									
	2.42	**SAND** Brown, fine to medium sand with small to large pebbles, small cobble and some organics, dry; no petroleum hydrocarbon odour or sheen observed.							
0.5		**CLAY** Grey, hard clay, dry to wet; petroleum hydrocarbon odour observed.							
1.0									
1.5					GR	*1			45
	1.12	**AUGERED** Augered to 3.3m to install well.							
2.0									
2.5									
3.0									
	-0.53	End of Borehole @ 3.3 m							

WELL CONSTRUCTION

Date Completed : 11-22-11

PROTECTIVE WELL CASING
- Material : Steel
- Diameter : 100 mm
- Joints : N/A

WELL & PIPE SCREEN
- Material : Sch. 40 PVC
- Diameter : 50 mm
- Joints : Flush
- Opening : 10 Slot

SAND PACK : No. 2 Silica Sand

ANNULUS SEAL : Bentonite

NOTES

The measuring point used is the top of the well casing, which has a geodetic elevation of 3.83masl.

On this log, the water level measurement and elevation have been adjusted to grade.

Stick up is 1.0m above ground surface

*Submitted for laboratory analysis.

Water level measured on December 2, 2011 at 2.45m.

Approximate water level measured at time of drilling was 1.6m from ground surface.

LOG OF 15-TC-MW8

PROJECT No.:	TF15076601	ELEVATION:	2.72 m
CLIENT:	PWGSC/Transport Canada	DATUM:	Sea Level
PROJECT NAME:	Otter Creek	METHOD:	Hand Auger
LOCATION:	Otter Creek, NL	DIAMETER:	50 mm
DATE DRILLED:	8-26-15	WATER LEVEL:	1.39 m
LOGGED BY:	C. Pottle & W. Tuttle	CONTRACTOR:	AMEC Foster Wheeler

amec

DEPTH (m)	ELEVATION (m)	STRATIGRAPHIC DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm)	SAMPLES N-VALUE or RQD%	SAMPLES OVM (ppm)	WELL CONSTRUCTION
0	2.72									
0.5		**FILL** Grey brown sand and gravel with a lot of debris; brick, glass, concrete and plastic; petroleum hydrocarbon odour and sheen observed.								
1.0						-	0	-	-	
1.5										
2.0	0.68	End of Borehole @ 2 m								

Date Completed : 8-26-15

PROTECTIVE WELL CASING
Material : Steel
Diameter : 100 mm
Joints : N/A

WELL & PIPE SCREEN
Material : Sch. 40 PVC
Diameter : 50 mm
Joints : Flush
Opening : 10 Slot

SAND PACK : Silica Sand

ANNULUS SEAL : None

NOTES:

The measuring point used is the top of the well casing, which has a geodetic elevation of 3.879 masl.

On this log, the water level measurement and elevation have been adjusted to grade.

Stick up is 1.156m above ground surface.

Not able to collect any soil samples during installation due to buried debris.

LOG OF 15-TC-MW9

PROJECT No.:	TF15076601	ELEVATION:	2.53 m
CLIENT:	PWGSC/Transport Canada	DATUM:	Sea Level
PROJECT NAME:	Otter Creek	METHOD:	Geoprobe
LOCATION:	Otter Creek, NL	DIAMETER:	50 mm
DATE DRILLED:	12-9-15	WATER LEVEL:	1.15 m
LOGGED BY:	C. Youart	CONTRACTOR:	Cartwright Drilling

amec

DEPTH (m)	ELEVATION (m)	STRATIGRAPHIC DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	NUMBER	RECOVERY (mm)	N-VALUE or RQD%	OVM (ppm)
0	2.53								
0.5		**SAND** Greyish brown sand with gravel, bricks and concrete; petroleum hydrocarbon odour observed.			SS	1	600	-	20
1.0				▽	SS	2	600	-	240
1.5	1.01								
2.0		**NO RECOVERY**			-	-	0	-	-
	0.24								
2.5		**GRAVEL** Grey sandy gravel, wet; petroleum hydrocarbon odour observed.			SS	3	90	-	420
3.0	-0.52	End of Borehole @ 3 m							

WELL CONSTRUCTION

Date Completed : 12-9-15

PROTECTIVE WELL CASING
Material : Steel
Diameter : 100 mm
Joints : N/A

WELL & PIPE SCREEN
Material : Sch. 40 PVC
Diameter : 50 mm
Joints : Flush
Opening : 10 Slot

SAND PACK : Silica Sand

ANNULUS SEAL : None

NOTES:

The measuring point used is the top of the well casing, which has a geodetic elevation of 3.610 masl.

On this log, the water level measurement and elevation have been adjusted to grade.

Stick up is 1.080m above ground surface.

TF15076601 MW LOGS.GPJ 2/17/16 GOOSE WELL LOG

LOG OF 15-TC-MW11

PROJECT No.:	TF15076601	ELEVATION:	1.81 m
CLIENT:	PWGSC/Transport Canada	DATUM:	Sea Level
PROJECT NAME:	Otter Creek	METHOD:	Geoprobe
LOCATION:	Otter Creek, NL	DIAMETER:	50 mm
DATE DRILLED:	12-11-15	WATER LEVEL:	0.41 m
LOGGED BY:	W. Tuttle	CONTRACTOR:	Cartwright Drilling

amec

DEPTH (m)	ELEVATION (m)	STRATIGRAPHIC DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm)	SAMPLES N-VALUE or RQD%	SAMPLES OVM (ppm)
0	1.81	**ORGANICS** Blackish brown organics.		▽	SS	1	40	-	25
0.5									
1.0									
	0.32	End of Borehole @ 1.5 m							

WELL CONSTRUCTION

Date Completed : 12-11-15

PROTECTIVE WELL CASING
Material : Steel
Diameter : 100 mm
Joints : N/A

WELL & PIPE SCREEN
Material : Sch. 40 PVC
Diameter : 50 mm
Joints : Flush
Opening : 10 Slot

SAND PACK : Silica Sand

ANNULUS SEAL : None

NOTES:

The measuring point used is the top of the well casing, which has a geodetic elevation of 3.170 masl.

On this log, the water level measurement and elevation have been adjusted to grade.

Stick up is 1.360m above ground surface.

No soil sample collected due to low soil recovery.

TF15076601.MW LOGS.GPJ 2/17/16 GOOSE WELL LOG

LOG OF 17-MW53-N4W0

PROJECT No.:	TV942286.SP10-2017	ELEVATION:	2.78 m
CLIENT:	DND/DCC	DATUM:	Geodetic
PROJECT NAME:	2014 Drilling QA.SP10-2017	METHOD:	Geoprobe
LOCATION:	5 Wing Goose Bay	DIAMETER:	100 mm
DATE DRILLED:	7-17-17	WATER LEVEL:	4.5
LOGGED BY:	M. Kustudic	CONTRACTOR:	Altech

amec foster wheeler

DEPTH (m)	ELEVATION (m)	STRATIGRAPHIC DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	NUMBER	RECOVERY (mm)	N-VALUE or RQD%	OVM (ppm)
0	2.78				SS	1	1250		40
	2.72	**ORGANICS** Brown organic matter with sand.			SS	2	1250		85
	1.77	**SAND** Brown, medium sand, dry.			SS	3	1250		10
2	1.25	**CLAY** Hard, grey clay.			SS	4	2000		0
	-0.27	**SILT** Soft, grey silt, some clay.			SS	5	2000		0
4		**SAND** Grey, fine sand, wet.			SS	6	1500		75
					SS	7	1500		25
	-2.56				SS	8	1000		5
6	-3.32	**TILL** Gravelly till, cobble sized rocks, some coarse sand, wet. End of Borehole @ 6.1 m			SS	9	1000		0

WELL CONSTRUCTION

Date Completed : 7-17-17

PROTECTIVE WELL CASING
Material : Steel
Diameter : 100 mm
Joints : N/A

WELL & PIPE SCREEN
Material : Sch. 40 PVC
Diameter : 50 mm
Joints : Flush
Opening : 10 Slot

SAND PACK : Silica Sand

ANNULUS SEAL : Bentonite

NOTES:

The measuring point used is the top of the well casing, which has a geodetic elevation of 3.94 masl.

On this log, the water level measurement and elevation have been adjusted to grade.

Stick up is 1.16m above ground surface.

GOOSE WELL LOG_TV942286.SP10-2017 MW LOGS.GPJ AMEC HALIFAX.GDT 1/22/18

LOG OF 17-MW54-N4W0

PROJECT No.:	TV942286.SP10-2017	ELEVATION:	3.10 m
CLIENT:	DND/DCC	DATUM:	Geodetic
PROJECT NAME:	2014 Drilling QA.SP10-2017	METHOD:	Geoprobe
LOCATION:	5 Wing Goose Bay	DIAMETER:	100 mm
DATE DRILLED:	7-17-17	WATER LEVEL:	5.3
LOGGED BY:	M. Kustudic	CONTRACTOR:	Altech

amec foster wheeler

DEPTH (m)	ELEVATION (m)	STRATIGRAPHIC DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	NUMBER	RECOVERY (mm)	N-VALUE or RQD%	OVM (ppm)
0	3.10								
	3.04	**GRAVEL** Gravel with sand and organics.			SS	1	1500		800
	2.09	**SAND** Coarse sand and gravel.			SS	2	1500		1400
2	0.81	**CLAY** Hard, grey clay.			SS	3	1500		500
		Soft, grey, silty clay.			SS	4	2500		460
					SS	5	2500		250
					SS	6	2250		150
4	-1.17				SS	7	2250		2000
	-1.47	**SAND** Medium sand.			SS	8	2500		280
		CLAY Soft, grey, silty clay.			SS	9	2500		180
6	-3.00	**ROCK** Cobble sized rocks.			SS	10	0		10
					SS	11	0		10
8					SS	12	0		10
	-6.04				SS	13	0		10
		End of Borehole @ 9.1 m							

WELL CONSTRUCTION

Date Completed : 7-17-17

PROTECTIVE WELL CASING
Material : Steel
Diameter : 100 mm
Joints : N/A

WELL & PIPE SCREEN
Material : Sch. 40 PVC
Diameter : 50 mm
Joints : Flush
Opening : 10 Slot

SAND PACK : Silica Sand

ANNULUS SEAL : Bentonite

NOTES:

The measuring point used is the top of the well casing, which has a geodetic elevation of 4.31 masl.

On this log, the water level measurement and elevation have been adjusted to grade.

Stick up is 1.21m above ground surface.

GOOSE WELL LOG TV942286.SP10-2017 MW LOGS.GPJ AMEC HALIFAX.GDT 1/22/18

LOG OF 17-MW55-N4W0

PROJECT No.:	TV942286.SP10-2017	ELEVATION:	2.03 m
CLIENT:	DND/DCC	DATUM:	Geodetic
PROJECT NAME:	2014 Drilling QA.SP10-2017	METHOD:	Geoprobe
LOCATION:	5 Wing Goose Bay	DIAMETER:	100 mm
DATE DRILLED:	7-17-17	WATER LEVEL:	1.8
LOGGED BY:	M. Kustudic	CONTRACTOR:	Altech

amec foster wheeler

DEPTH (m)	ELEVATION (m)	STRATIGRAPHIC DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES TYPE	NUMBER	RECOVERY (mm)	N-VALUE or ROD%	OVM (ppm)
0	2.03								
	1.97	**ORGANICS** Organic matter with gravel and sand.			SS	1	750		200
					SS	2	750		200
	0.51	**GRAVEL** Brown, sandy gravel, wet.			SS	3	750		200
2		**NO RECOVERY**			SS	4	0		0
					SS	5	0		0
	-1.78				SS	6	2750		90
4		**COBBLES** Cobbles with coarse sand.			SS	7	250		90
	-2.54	**NO RECOVERY**			SS	8	250		0
	-3.30	**COBBLES** Cobbles with coarse sand.			SS	9	250		0
6	-4.07	End of Borehole @ 6.1 m							

WELL CONSTRUCTION

Date Completed : 7-17-17

PROTECTIVE WELL CASING
Material : Steel
Diameter : 100 mm
Joints : N/A

WELL & PIPE SCREEN
Material : Sch. 40 PVC
Diameter : 50 mm
Joints : Flush
Opening : 10 Slot

SAND PACK : Silica Sand

ANNULUS SEAL : Bentonite

NOTES:

The measuring point used is the top of the well casing, which has a geodetic elevation of 3.13 masl.

On this log, the water level measurement and elevation have been adjusted to grade.

Stick up is 1.11m above ground surface.

GOOSE WELL LOG TV942286.SP10-2017 MW LOGS.GPJ AMEC HALIFAX.GDT 1/22/18