



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH01a**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-38**

E **827906.58**
N **840773.17**

DATE from: **05/01/2012** to **14/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 21.54** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
07/01/2012	SW											21.54	0.00			
1									1	INSPECTION PIT	0.55					Firm, reddish brown (5YR/4/3), mottled yellow, slightly sandy, clayey SILT with occasional angular fine to medium gravel of weak tuff and quartz. (COLLUVIUM)
									2	INSPECTION PIT	0.55					
07/01/2012									3		1.55	20.04	1.50		V	Extremely weak, pinkish red (7.5YR/7/4), mottled yellow and brown, completely decomposed coarse ash METATUFF. (Firm, clayey SILT)
09/01/2012									4		3.00					
2								39 bls	5		3.45 3.50					
3									6		5.50	16.04	5.50		V	Extremely weak, greyish brown (10YR/5/2), mottled black, completely decomposed coarse ash METATUFF. (Firm, slightly sandy, clayey SILT)
4	SW 4.00 PW								7		5.91 5.96					
5									8		8.00					
6								200 bls	9		8.35 8.43					
7																
8																
9																
10												11.54	10.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 14/01/2012
CHECKED S.C. Wong
DATE 18/01/2012

REMARKS
1. An inspection pit was excavated to a depth of 1.50m.
2. Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.), 20.50m (3 nos.) and 38.00m (1 no.) below existing ground level on 09/01/2012, 10/01/2012 and 12/01/2012 respectively.
3. Environmental monitoring well was installed at 11.00m below existing ground level on 14/01/2012 and groundwater sampling was carried out on 03/02/2012.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH01a**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-38**

E **827906.58**
N **840773.17**

DATE from: **05/01/2012** to **14/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 21.54** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
											11.54	10.00		V	As sheet 1 of 4.	
11				3%				200 bis	10	10.50		11.04	10.50		V	Extremely weak, light brown (7.5YR/6/3), completely decomposed coarse ash METATUFF. (Firm, clayey SILT)
									11	10.82 10.97						
12	PW 12.00 HW															
13		1.20m at 18:00 3.15m at 08:00		5%				88 bis	12	13.00		8.54	13.00		V	Extremely weak, yellowish brown (10YR/5/6) to greyish brown (10YR/5/2), mottled brown, completely decomposed coarse ash METATUFF. (Firm to stiff, slightly sandy, clayey SILT)
									13	13.45 13.50						
14																
16				8%				65 bis	14	15.50						
									15	15.65 16.00						
17																
18				6%				200 bis	16	18.00						
									17	18.18 18.23						
19																
20												1.54	20.00			

- Small Disturbed Sample
- Piston sample
- U78 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocoring Sample
- 100mm Vibrocoring Sample
- Vibrocoring Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televue Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 14/01/2012
CHECKED S.C. Wong
DATE 18/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH01a**

CONTRACT No.: **GE/2010/01**

SHEET: **3** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-38**

E **827906.58**
N **840773.17**

DATE from: **05/01/2012** to **14/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 21.54** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
21				89				130 bls	18	20.50				V	As sheet 2 of 4.
									19	20.55 21.00					
22															
23		0.90m at 18:00		89				100 bls	20	23.00					
		5.85m at 08:00							21	23.45 23.50					
24															
25															
26				6				137 bls	22	25.50	-3.96	25.50		V	
									23	25.95 26.00				Extremely weak, reddish brown (5YR/4/3) to dark brown (7.5YR/3/4), completely decomposed coarse ash METATUFF. (Stiff, slightly sandy, clayey SILT with some angular fine to medium gravel)	
27															
28				14				200 bls	24	28.00	-6.46	28.00		V	
									25	28.27 28.32				Extremely weak, greyish brown (10YR/5/2) to yellowish brown (10YR/5/6), completely decomposed coarse ash METATUFF. (Very stiff, slightly sandy, clayey SILT)	
29															
30															

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 14/01/2012
CHECKED S.C. Wong
DATE 18/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH01a**

CONTRACT No.: **GE/2010/01**

SHEET: **4** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-38**

E **827906.58**
N **840773.17**

DATE from: **05/01/2012** to **14/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 21.54** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
31				89				200 bls	26	30.50		-8.46	30.00		V	As sheet 3 of 4.
									27	30.68 30.73						
32																
33		1.85m at 18:00		0				200 bls	28	33.00		-11.46	33.00		V	Very weak, brown (7.5YR/5/4), completely decomposed coarse ash METATUFF. (Slightly sandy angular fine to coarse GRAVEL and COBBLES)
		5.80m at 08:00														
34																
35																
36	HW 35.50			0				200 bls	29	35.50		-13.96	35.50		V	Extremely weak, grey (7.5YR/6/1) and dark brown (7.5YR/3/4), completely decomposed coarse ash METATUFF. (Very stiff, slightly sandy, clayey SILT)
37																
38		1.85m at 18:00		0				200 bls	30	38.00		-16.46	38.00		V	Extremely weak, dark brown (7.5YR/3/4), completely decomposed coarse ash TUFF. (Very stiff, slightly sandy, silty CLAY with some angular fine to medium gravel)
39																End of investigation hole at 38.22m.
40																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televewer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 14/01/2012
CHECKED S.C. Wong
DATE 18/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH04**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **3**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-36**

E **828416.08**
N **840517.08**

DATE from: **31/12/2011** to **09/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 11.96** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
											1.96	10.00		V	As sheet 1 of 3.
11				100				62 bls	10 11	10.50 10.95 11.00	1.46	10.50		V	Extremely weak, dark grey (5YR/4/1) and brown (7.5YR/5/4), completely decomposed coarse ash METATUFF. (Soft, clayey SILT with some angular fine to medium gravel)
12															
13				44				41 bls	12 13	13.00 13.45 13.50	-1.04	13.00		V	Extremely weak, reddish brown (5YR/4/3), locally dark grey and black, completely decomposed coarse ash METATUFF. (Stiff, clayey SILT)
14															
15															
16	SW 15.50 HW	2.30m at 18:00 3.55m at 08:00		100				78 bls	14 15	15.50 15.85 16.00					
17															
18				100				51 bls	16 17	18.00 18.45 18.50	-6.04	18.00		V	Extremely weak, greyish brown (10YR/5/2), completely decomposed coarse ash METATUFF. (Very stiff, clayey SILT)
19															
20											-8.04	20.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 13/01/2012
CHECKED S.C. Wong
DATE 18/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH04**

CONTRACT No.: **GE/2010/01**

SHEET: **3** of **3**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-36**

E **828416.08**

N **840517.08**

DATE from: **31/12/2011** to **09/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 11.96** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
											-8.04	20.00		V	As sheet 2 of 3.
21	HW 20.70			0				200 bls	18	20.50 20.70	-8.54 -8.74	20.50 20.70		IV II	Weak, brownish grey, highly decomposed coarse ash METATUFF. Recovered as slightly sandy angular fine to coarse gravel. Strong, grey, spotted black, dappled white, slightly decomposed coarse ash METATUFF.
22		3.50m at 18:00		100	90	72	3.9		T201						Strong, grey, spotted black, dappled white, slightly decomposed coarse ash METATUFF. Joints are closely to medium spaced, rough planar and stepped, very narrow, calcite and kaolin (<1mm) coated, dipping at 5°-15°, 25°-35° and 45°-55°.
23															End of investigation hole at 22.25m.
24															
25															
26															
27															
28															
29															
30												30.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPF Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 13/01/2012
 CHECKED S.C. Wong
 DATE 18/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH06**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-13**

E **828473.07**
N **840803.13**

DATE from: **27/01/2012** to **13/02/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL. **+ 14.53** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
31/01/2012	SW										14.53	0.00				
1		Dry at 18:00								1	INSPECTION PIT	0.55	14.03	0.50		Firm, dark grey (5YR/4/1), sandy clayey SILT with some angular fine to medium gravel of weak to moderately weak tuff and quartz. (TOP SOIL)
		Dry at 08:00								2		9.88	13.53	1.00		Brown (7.5YR/5/4) to yellowish brown (10YR/5/6), slightly clayey, silty sandy angular fine to medium GRAVEL of quartz. (COLLUVIUM)
31/01/2012 04/02/2012										3		1.58				Firm, dark brown (7.5YR/3/4), sandy clayey SILT with some angular fine to medium gravel of weak to moderately weak tuff and quartz. (COLLUVIUM)
2																
3	SW 3.00 PW							41 bls		4		3.00	11.53	3.00	V	Extremely weak, reddish brown (5YR/4/3) to brown (7.5YR/5/4), mottled red, completely decomposed fine ash METATUFF. (Firm, clayey SILT)
4										5		3.45 3.50				
5																
6								50 bls		6		5.50				
7										7		5.95 6.00				
8		4.40m at 18:00														
04/02/2012 06/02/2012		4.20m at 08:00						60 bls		8		8.00				
9										9		8.45 8.50				
10												4.53	10.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 23/02/2012
CHECKED S.C. Wong
DATE 24/02/2012

REMARKS

- An inspection pit was excavated to a depth of 1.50m.
- Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.), 20.50m (3 nos.) and 45.87m (1 no.) below existing ground level on 04/02/2012, 07/02/2012 and 10/02/2012 respectively.
- Environmental monitoring well was installed at 12.00m below existing ground level on 13/02/2012 and groundwater sampling was carried out on 21/02/2012.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH06**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-13**

E **828473.07**

DATE from: **27/01/2012** to **13/02/2012**

N **840803.13**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 14.53** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
											4.53	10.00		V	As sheet 1 of 5.	
11				84				140 bls	10	U76	10.50	4.03	10.50		V	Extremely weak, brown (7.5YR/5/4) to yellowish brown (10YR/5/6), completely decomposed fine ash METATUFF. (Firm to stiff, slightly sandy, clayey SILT)
									11	U100	10.95 11.00					
12								∅								
13				84				200 bls	12	U76	13.00					
									13	U100	13.31 13.35					
14																
15																
16	PW 15.50 HW 4.60m at 08:00	2.70m at 18:00		100				62 bls	14	U76	15.50					
									15	U100	15.95 16.00					
17																
18				84				128 bls	16	U76	18.00					
									17	U100	18.45 18.50					
19																
20												-5.47	20.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televue Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 23/02/2012
 CHECKED S.C. Wong
 DATE 24/02/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH06**

CONTRACT No.: **GE/2010/01**

SHEET: **3** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-13**

E **828473.07**

DATE from: **27/01/2012** to **13/02/2012**

N **840803.13**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**


GROUND LEVEL **+ 14.53** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
21				100				60 bls	18	█	20.50		20.00		V	As sheet 2 of 5.
									19	█	20.95 21.00					
22																
23		2.80m at 18:00 4.85m at 08:00		0				145 bls	20	█	23.00 23.45 23.50					
24																
25																
26				0				130 bls	21	█	25.50 25.95 26.00	-10.97	25.50		V	Extremely weak, light grey (10R/7/1), completely decomposed fine ash METATUFF. (Stiff, clayey SILT)
27																
28				0				144 bls	22	█	28.00 28.45 28.50	-13.47	28.00		V	Extremely weak, purplish brown (7.5R/3/3), completely decomposed fine ash METATUFF. (Stiff, slightly sandy, clayey SILT)
29																
30												-15.47	30.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 23/02/2012
 CHECKED S.C. Wong
 DATE 24/02/2012

REMARKS

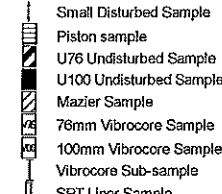
 FUGRO GEOTECHNICAL SERVICES LTD	DRILLHOLE RECORD	HOLE No. KTN-ASBH06
	CONTRACT No.: GE/2010/01	SHEET: 4 of 5

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: Rotary Drilling	CO-ORDINATES:	WORKS ORDER No. GE/2010/01.38
MACHINE & No.: FDR-13	E 828473.07 N 840803.13	DATE from: 27/01/2012 to 13/02/2012

FLUSHING MEDIUM: Water	ORIENTATION: Vertical	GROUND LEVEL + 14.53 mPD
-------------------------------	------------------------------	---------------------------------

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
				0				195 bls			-15.47	30.00		V	As sheet 3 of 5.
31									23	30.50 30.82 30.87	-15.97	30.50		V	Very weak, grey (7.5YR/6/1), completely decomposed fine ash METATUFF. (Stiff, sandy clayey SILT with some angular fine to medium gravel)
32															
33		3.50m at 18:00 5.20m at 08:00		99				97 bls	24 25	33.00 33.45 33.50	-18.47	33.00		V	Extremely weak to very weak, brownish yellow (10YR/6/8) to yellowish brown (10YR/5/6), completely decomposed fine ash METATUFF. (Very stiff, slightly sandy, clayey SILT)
34															
35															
36				100				88 bls	26 27	35.50 35.95 36.00					
37															
38				100				114 bls	28 29	38.00 38.45 38.50					
39															
40											-25.47	40.00			

	Standard Penetration Test In-situ Vane Shear Test Permeability Test Pressuremeter Test Televue Survey Packer Test Impression Packer Test Water Sample Standpipe Piezometer Tip	LOGGED <u>P. Zhang</u> DATE <u>23/02/2012</u> CHECKED <u>S.C. Wong</u> DATE <u>24/02/2012</u>	REMARKS
---	---	--	---------



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH06**

CONTRACT No.: **GE/2010/01**

SHEET: **5** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-13**

E **828473.07**

N **840803.13**

DATE from: **27/01/2012** to **13/02/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 14.53** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
41				92				200 bls	30	▨	40.50				V	As sheet 4 of 5.
									31	▨	40.89 40.94					
42																
43		3.00m at 18:00		108				133 bls	32	▨	43.00	-28.47	43.00		V	Extremely weak to very weak, grey (7.5YR/6/1), completely decomposed fine ash METATUFF. (Very stiff, slightly sandy, clayey SILT with occasional angular fine gravel)
44		5.80m at 08:00							33	▨	43.45 43.50					
45																
46	HW 45.50	4.20m at 18:00		108				200 bls	34	▨	45.50					End of investigation hole at 45.87m.
46									35	▨	45.82 45.87	31.34	45.87			
47																
48																
49																
50																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang

DATE 23/02/2012

CHECKED S.C. Wong

DATE 24/02/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH07**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828469.74**
N **840994.99**

DATE from: **02/02/2012** to **13/02/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 15.15** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
03/02/2012	SW										15.15	0.00			
1									1	INSPECTION PIT	0.65				Firm, reddish brown (5YR/4/3), slightly sandy, clayey SILT with some angular fine to coarse quartz gravel. (COLLUVIUM)
									2		0.85	14.15	1.00		Firm, reddish brown (5YR/3/4), slightly sandy, clayey SILT. (COLLUVIUM)
03/02/2012									3		1.55				
04/02/2012									4		3.00	12.15	3.00		Firm, yellow (10YR/7/8), mottled red, clayey SILT. (COLLUVIUM)
2								32 bls	5		3.45				
3									6		5.50				
4									7		5.95				
5									8		6.00				
6	SW PW							57 bls	9		8.00				
7											9.65	5.50		V	Extremely weak, yellowish brown (10YR/5/6) to reddish brown (5YR/3/4), completely decomposed fine ash METATUFF. (Stiff, clayey SILT)
8		1.50m at 18:00 2.75m at 08:00						30 bls			8.45				
9											8.50				
10											5.15	10.00			

- Small Disturbed Sample
- Piston Sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 16/02/2012
CHECKED S.C. Wong
DATE 22/02/2012

REMARKS

- An inspection pit was excavated to a depth of 1.50m.
- Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.), 20.50m (3 nos.) and 44.17m (1 no.) below existing ground level on 04/02/2012, 07/02/2012 and 10/02/2012 respectively.
- Environmental monitoring well was installed at 11.00m below existing ground level on 13/02/2012 and groundwater sampling was carried out on 21/02/2012.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH07**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828469.74**

DATE from: **02/02/2012** to **13/02/2012**

N **840994.99**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 15.15** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description	
									No.	Type	Depth						
11				100				39 bls	10	█	10.50				V	As sheet 1 of 5.	
									11	▲	10.85 11.00						
12																	
13	PW 13.00 HW			100				28 bls	12	▨	13.00						
									13	▲	13.45 13.50						
14																	
15																	
16		0.85m at 18:00 4.45m at 08:00		61				200 bls	14	▨	15.50	-0.35	15.50		V		Extremely weak, brown (7.5YR/5/4), dappled white, completely decomposed fine ash METATUFF. (Stiff, clayey SILT)
									15	▲	15.63 15.68						
17																	
18				100				62 bls	16	▨	18.00						
									17	▲	18.45 18.50						
19																	
20												-4.65	20.00				

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 16/02/2012
 CHECKED S.C. Wong
 DATE 22/02/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH07**

CONTRACT No.: **GE/2010/01**

SHEET: **3** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828469.74**

DATE from: **02/02/2012** to **13/02/2012**

N **840994.99**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 15.15** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
																As sheet 2 of 5.
21				100				67 bls	18	20.50		-5.35	20.50		V	Extremely weak, grey (7.5YR/6/1), completely decomposed fine ash METATUFF. (Stiff, clayey SILT)
								19	20.95 21.00							
22																
23				100				77 bls	20	23.00						
								21	23.45 23.50							
24																
25																
26		1.20m at 18:00		100				92 bls	22	25.50		-10.35	25.50		V	Extremely weak, brown (7.5YR/5/4), completely decomposed fine ash METATUFF. (Stiff, slightly sandy, clayey SILT) 25.50 - 28.00m : With some angular fine to medium gravel.
		4.75m at 08:00						23	25.95 26.00							
27																
28				100				95 bls	24	28.00		-12.85	28.00			
								25	28.45 28.50							
29																
30												-14.85	30.00			

07/02/2012
08/02/2012

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 16/02/2012
 CHECKED S.C. Wong
 DATE 22/02/2012

REMARKS



FUGRO
GEOTECHNICAL
SERVICES LTD

DRILLHOLE RECORD

HOLE No. **KTN-ASBH07**

CONTRACT No.: **GE/2010/01**

SHEET: **4** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828469.74**

DATE from: **02/02/2012** to **13/02/2012**

N **840994.99**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 15.15** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	F I	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
											-14.85	30.00				
31				100				126 bls	26	Diagonal lines	30.50			V		As sheet 3 of 5.
									27	Diagonal lines	30.95 31.00			V		Extremely weak, grey (7.5YR/6/1), locally yellowish brown (10YR/5/6), dappled brown, completely decomposed fine ash METATUFF. (Stiff, clayey SILT)
32																
33				100				182 bls	28	Diagonal lines	33.00					
									29	Diagonal lines	33.45 33.50					
34																
35																
36		1.60m at 18:00 4.25m at 08:00		100				148 bls	30	Diagonal lines	35.50					
									31	Diagonal lines	35.95 36.00					
37																
38				85				101 bls	32	Diagonal lines	38.00					
									33	Diagonal lines	38.45 38.50					
39																
40																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 16/02/2012
 CHECKED S.C. Wong
 DATE 22/02/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH07**

CONTRACT No.: **GE/2010/01**

SHEET: **5** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828469.74**

DATE from: **02/02/2012** to **13/02/2012**

N **840994.99**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 15.15** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
41 08/02/2012 10/02/2012		1.10m at 18:00 4.75m at 08:00		78				123 bts	34 35		40.50 40.50 41.00	-24.85 40.00		V	As sheet 4 of 5.	
42																
43	HW 42.65		70	100	74	74	4.6				42.65	-27.50 42.65		II	Strong, dark grey, spotted white, slightly decomposed fine ash METATUFF. Joints are closely to medium, occasionally very closely spaced, rough planar to stepped, very narrow, iron oxide stained and calcite coated, dipping at 5°-15°, 20°-30° and subvertical.	
44 10/02/2012		5.07m at 18:00									44.17	-28.70 -28.77 -29.02 44.17	-43.85 -43.92 -44.17	III II	43.85 - 43.92m : Moderately strong, moderately decomposed fine ash METATUFF.	
45																End of investigation hole at 44.17m.
46																
47																
48																
49																
50																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zeng
DATE 16/02/2012
CHECKED S.C. Wong
DATE 22/02/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH08**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828444.57**
N **841129.05**

DATE from: **03/01/2012** to **10/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 11.89** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
03/01/2012	SW										11.89	0.00				
1									1	INSPECTION PIT	0.65	11.39	0.50			Firm, grey (7.5YR/6/1) to dark grey (5YR/4/1), slightly sandy, silty CLAY with occasional decayed wood fragments. (FILL) 0.00 - 0.50m : With some angular fine to medium gravel of moderately weak to moderately strong tuff and quartz. (FILL)
03/01/2012 04/01/2012									2	INSPECTION PIT	0.85					
2									3		1.65	10.39	1.50			Light brownish grey (10YR/6/2), slightly silty, clayey sandy angular to subangular fine to coarse GRAVEL and COBBLES of strong quartz. (ALLUVIUM)
3								135 bls	4		3.00					
4									5		3.45					
5									6		3.50					
6	SW PW							55 bls	7		5.50	6.39	5.50		V	Extremely weak, reddish brown (5YR/4/3), spotted white, completely decomposed coarse ash METATUFF. (Firm, silty CLAY)
7									8		5.85					
8									9		6.00					
04/02/2012 05/01/2012		0.90m at 18:00 1.80m at 08:00						41 bls	10		8.45					
9									11		8.50					
10									12							

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 13/01/2012
CHECKED S.C. Wong
DATE 18/01/2012

REMARKS

1. An inspection pit was excavated to a depth of 1.50m.
2. Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.), 20.50m (3 nos.) and 41.00m (1 no.) below existing ground level on 04/01/2012, 06/01/2012 and 09/01/2012 respectively.
3. Environmental monitoring well was installed at 7.00m below existing ground level on 10/01/2012 and groundwater sampling was carried out on 02/02/2012.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH08**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828444.57**

DATE from: **03/01/2012** to **10/01/2012**

N **841129.05**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 11.89** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
											1.89	10.00		V	As sheet 1 of 5.
11				76				79 bls	8	Diagonal lines	10.50	1.39	10.50	V	Extremely weak, light brown (7.5YR/6/3), completely decomposed coarse ash METATUFF. (Firm, slightly sandy, clayey SILT)
									9	Diagonal lines	10.65		11.00		
13				100				28 bls	10	Diagonal lines	13.00	-1.11	13.00	V	Extremely weak, brown (7.5YR/5/4), completely decomposed coarse ash METATUFF. (Firm, silty CLAY)
									11	Diagonal lines	13.45		13.50		
15	PW 15.00 HW														
16				100				36 bls	12	Diagonal lines	15.50	-3.61	15.50	V	Extremely weak, greyish brown (10YR/5/2) to brownish grey (10YR/5/2), completely decomposed coarse ash METATUFF. (Firm to stiff, slightly sandy, clayey SILT)
									13	Diagonal lines	15.85		16.00		
18				100				89 bls	14	Diagonal lines	18.00				
									15	Diagonal lines	18.45		18.50		
20											-8.11	20.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zeng
 DATE 13/01/2012
 CHECKED S.C. Wong
 DATE 18/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH08**

CONTRACT No.: **GE/2010/01**

SHEET: **3** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828444.57**

DATE from: **03/01/2012** to **10/01/2012**

N **841129.05**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 11.89** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
		0.90m at 18:00														
		1.85m at 08:00														
21				67				90 bls	16	20.50						As sheet 2 of 5.
									17	20.95 21.00						
22																
23				100				116 bls	18	23.00						
									19	23.45 23.50						
24																
25																
26				100				98 bls	20	25.50						
									21	25.95 26.00						
27																
28				67				91 bls	22	28.00	-16.11	28.00				Extremely weak, grey (7.5YR/6/1), spotted white, completely decomposed coarse ash METATUFF. (Stiff, slightly sandy, clayey SILT)
									23	28.45 28.50						
29																
30											-16.11	30.00				

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocure Sample
- 100mm Vibrocure Sample
- Vibrocure Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 13/01/2012
 CHECKED S.C. Wong
 DATE 18/01/2012

REMARKS



FUGRO
GEOTECHNICAL
SERVICES LTD

DRILLHOLE RECORD

HOLE No. **KTN-ASBH08**

CONTRACT No.: **GE/2010/01**

SHEET: **4** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828444.57**
 N **841129.05**

DATE from: **03/01/2012** to **10/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**


GROUND LEVEL **+ 11.89** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
											-18.11	30.00		V	As sheet 3 of 5.
31				100				200 bls	24	30.50	-18.61	30.50		V	Very weak, dark brownish grey (10YR/4/2), completely decomposed coarse ash METATUFF. (Very stiff, slightly sandy, clayey SILT with some angular fine to medium gravel)
								25	30.85 30.90						
32															
33		1.10m at 18:00													
		1.90m at 08:00		6				129 bls	26	33.00	-21.11	33.00		V	Extremely weak, greyish brown (10YR/5/2), completely decomposed coarse ash METATUFF. (Stiff, slightly sandy, clayey SILT)
								27	33.45 33.50						
34															
35															
36				100				156 bls	28	35.50	-23.61	35.50		V	Extremely weak to very weak, grey (7.5YR/6/1) and brown (7.5YR/5/4), completely decomposed coarse ash METATUFF. (Stiff, slightly sandy, clayey SILT)
								29	35.85 36.00						
37															
38				8				200 bls	30	38.00	-26.11	38.00		V	Very weak, brown (7.5YR/5/4), completely decomposed coarse ash METATUFF. (Very stiff, slightly sandy, clayey SILT with some angular fine to medium gravel)
								31	38.23 38.28						
39															
40											-28.11	40.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 13/01/2012
 CHECKED S.C. Wong
 DATE 18/01/2012

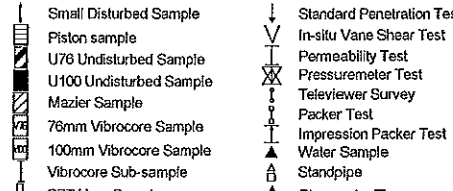
REMARKS

 FUGRO GEOTECHNICAL SERVICES LTD	DRILLHOLE RECORD		HOLE No. KTN-ASBH08
	CONTRACT No.: GE/2010/01	SHEET: 5 of 5	

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: Rotary Drilling	CO-ORDINATES: E 828444.57 N 841129.05	WORKS ORDER No. GE/2010/01.38
MACHINE & No.: FDR-35		DATE from: 03/01/2012 to 10/01/2012
FLUSHING MEDIUM: Water	ORIENTATION: Vertical	GROUND LEVEL + 11.89 mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
	HW 40.50	1.20m at 18:00									-28.11	40.00		V	As sheet 4 of 5.	
07/01/2012 09/01/2012		1.99m at 08:30		89				117 bls	32	Diagonal Hatching	40.50	-28.61	40.50	V	Extremely weak to very weak, grey (7.5YR/6/1) and brown (7.5YR/5/4), completely decomposed coarse ash METATUFF. (Stiff, slightly sandy, clayey SILT)	
09/01/2012		1.20m at 18:00							33	Diagonal Hatching	40.85 41.00	-29.11	41.00	V		
41															End of investigation hole at 41.00m.	
42																
43																
44																
45																
46																
47																
48																
49																
50																

	LOGGED <u>P. Zhang</u> DATE <u>13/01/2012</u> CHECKED <u>S.C. Wong</u> DATE <u>18/01/2012</u>	REMARKS
---	--	---------



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH09**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **4**

PROJECT: **Agreement No. GE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FHS-07**

E **827923.77**
N **841232.80**

DATE from: **05/12/2011** to **24/12/2011**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 28.13** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
09/12/2011	SW										28.13	0.00			
1									1	INSPECTION PIT		0.55			Firm, brownish red (5YR/4/3) to red (10R/5/8), slightly sandy, clayey SILT with some angular fine to medium gravel of weak to moderately weak tuff. (FILL)
2									2	INSPECTION PIT		1.55			
3	SW 3.00 PW														
3		3.10m at 18:00						43 bls	4		25.13	3.00			Firm, brown (7.5YR/5/4), slightly sandy, silty CLAY with some angular fine to medium gravel of moderately weak to moderately strong tuff. (COLLUVIUM)
4		Dry at 08:00							5			3.45 3.50			
5															
6								31 bls	6		22.63	5.50		VI	Firm, reddish brown (5YR/4/3), mottled yellow, slightly sandy, silty CLAY. (RESIDUAL SOIL)
7									7			5.95 6.00			
8								77 bls	8		20.13	8.00		V	Extremely weak, reddish brown (5YR/4/3), mottled brown, completely decomposed METATUFF. (Stiff, slightly sandy, clayey SILT)
9		2.50m at 18:00 4.80m at 08:00							9			8.45 8.50			
10											18.13	10.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 24/12/2011
CHECKED S.C. Wong
DATE 03/01/2012

REMARKS

- An inspection pit was excavated to a depth of 1.50m.
- Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.), 15.00m (1 no.) and 30.68m (1 no.) below existing ground level on 09/12/2011, 13/12/2011 and 19/12/2011 respectively.
- Environmental monitoring well was installed at 11.30m below existing ground level on 21/12/2011 and groundwater sampling was carried out on 24/12/2011.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH09**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FHS-07**

E **827923.77**
N **841232.80**

DATE from: **05/12/2011** to **24/12/2011**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 28.13** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
11	PW 10.50 HW			89				47 bls	10	█	10.50				V	As sheet 1 of 4.
									11	█	10.55 11.00					
12																
13				100				63 bls	12	▨	13.00					
14		3.80m at 18:00 5.00m at 08:00							13	█	13.45 13.50					
15																
16				100				90 bls	14	▨	15.50					
17		4.20m at 18:00 5.80m at 08:00							15	█	15.95 16.00					
18				100				62 bls	16	▨	18.00	10.13	18.00		V	
19									17	▨	18.45 18.50					
20																

Extremely weak, brownish grey (10YR/5/2), completely decomposed METATUFF. (Stiff, slightly sandy, clayey SILT)

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 24/12/2011
CHECKED S.C. Wong
DATE 03/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH09**

CONTRACT No.: **GE/2010/01**

SHEET: **3** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FHS-07**

E **827923.77**
N **841232.80**

DATE from: **05/12/2011** to **24/12/2011**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 28.13** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
21				100				95 bls	18	20.50				V	As sheet 2 of 4.
									19	20.85 21.00					
22															
23				100				200 bls	20	23.00					25.50 - 25.95m : Firm, sandy clayey SILT.
24	4.70m at 18:00 6.00m at 08:00								21	23.45 23.50					
25															
26				85				115 bls	22	25.50	2.63	25.50			25.50 - 25.95m : Firm, sandy clayey SILT.
27									23	25.95 26.00	2.18	25.95			
28		5.60m at 18:00 6.00m at 09:00		0				200 bls	24	28.00 28.08	0.13	28.00		V	Very weak, grey (7.5YR/6/1), completely decomposed METATUFF. (Sandy, silty clayey angular fine to coarse GRAVEL)
29															
30											-1.87	30.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 24/12/2011
CHECKED S.C. Wong
DATE 03/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH09**

CONTRACT No.: **GE/2010/01**

SHEET: **4** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FHS-07**

E **827923.77**
N **841232.80**

DATE from: **05/12/2011** to **24/12/2011**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 28.13** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
	HW 30.50	5.70m at 18.00		0				200 bls				-1.87	30.00		V	As sheet 3 of 4.
31									25	▨	30.50	-2.37	30.50		IV	30.50 - 30.68m : Weak, highly decomposed METATUFF. Recovered as angular medium to coarse gravel and cobbles.
											30.68	-2.55	30.68			End of investigation hole at 30.68m.
32																
33																
34																
35																
36																
37																
38																
39																
40																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 24/12/2011
CHECKED S.C. Wong
DATE 03/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH12**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-13**

E **827952.51**
N **841080.06**

DATE from: **20/12/2011** to **05/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 24.88** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
21/12/2011	SW										24.88	0.00			
1									1	INSPECTION PIT	0.50	24.38	0.50		Firm, dark grey (5YR/4/1), slightly sandy SILT with some angular fine to medium gravel of moderately weak tuff with occasional wood and brick fragments. (FILL)
									2		0.88				Firm, reddish brown (5YR/4/3), slightly sandy, silty CLAY with occasional angular fine gravel of weak tuff and quartz. (COLLUVIUM)
21/12/2011 28/12/2011									3		1.68				
2															
3	SW 3.00 PW			0				183 bls			3.00	21.88	3.00	V	Extremely weak, brown (7.5YR/5/4), completely decomposed METATUFF. (Stiff, slightly sandy, clayey SILT with occasional angular fine to medium gravel)
4									4		3.45 3.50				
5															
6		5.30m at 08:00		0				55 bls			5.50	19.38	5.50	V	Extremely weak, brownish yellow (10YR/6/8), mottled light brown, completely decomposed METATUFF. (Firm, slightly sandy, clayey SILT)
28/12/2011 29/12/2011									5		5.95 6.00				
7															
8				100				49 bls			8.00	16.88	8.00	V	Extremely weak, purplish red (7.5R/3/4), completely decomposed METATUFF. (Stiff, slightly sandy, clayey SILT)
9	PW 9.00 HW										8.45 8.50				
10											14.88	10.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televue Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED **P. Zhang**
DATE **04/01/2012**
CHECKED **S.C. Wong**
DATE **07/01/2012**

REMARKS
1. An inspection pit was excavated to a depth of 1.50m.
2. Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.), 28.00m (3 nos.) and 37.52m (1 no.) below existing ground level on 28/12/2011, 30/12/2011 and 03/01/2012 respectively.
3. Environmental monitoring well was installed at 10.50m below existing ground level on 04/01/2012 and groundwater sampling was carried out on 02/02/2012.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH12**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-13**

E **827952.51**

DATE from: **20/12/2011** to **05/01/2012**

N **841080.06**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 24.88** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
												14.88	10.00		V	As sheet 1 of 4.
11				100				41 bls	8	10.50		14.38	10.50		V	Extremely weak, brown (7.5YR/5/4) to dark brown (7.5YR/3/4) and greyish brown (10YR/5/2), completely decomposed METATUFF. (Stiff, slightly sandy, clayey SILT)
									9	10.65 11.00						
12																
13				98				200 bls	10	13.00						
									11	13.28 13.33						
14																
15																
16				98				200 bls	12	15.50						
									13	15.95 16.00						
17																
18		3.50m at 18:00														
19		5.35m at 08:00		93				72 bls	14	18.00		6.88	18.00		V	Extremely weak to very weak, grey (7.5YR/6/1) to brownish grey (10YR/5/2), completely decomposed METATUFF. (Stiff, slightly sandy, clayey SILT)
									15	18.45 18.50						
20												4.88	20.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 04/01/2012
 CHECKED S.C. Wong
 DATE 07/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH12**

CONTRACT No.: **GE/2010/01**

SHEET: **3** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-13**

E **827952.51**

DATE from: **20/12/2011** to **05/01/2012**

N **841080.06**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 24.88** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	F1	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description	
									No.	Type	Depth						
21				100				77 bls	16	20.50						As sheet 2 of 4.	
									17	20.95 21.00							
22																	
23				90				50 bls	18	23.00							
									19	23.45 23.50							
24																	
25																	
26				0				200 bls	20	25.50 25.61 25.66	-0.62 -0.73	25.50 25.61					25.50 - 25.61m : With some angular fine to coarse gravel of quartz.
27																	
28				84				200 bls	21	28.00							
									22	28.32 28.37							
29		3.90m at 18:00 5.50m at 08:00															
30																	

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 04/01/2012
 CHECKED S.C. Wong
 DATE 07/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH12**

CONTRACT No.: **GE/2010/01**

SHEET: **4** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-13**

E **827952.51**
N **841080.06**

DATE from: **20/12/2011** to **05/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 24.88** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
31				68				200 bls	23	30.50					As sheet 2 of 4.
									24	30.86 30.91					
32															
33				78				161 bls	25	33.00					
									26	33.45 33.50					
34															
35															
36		4.80m at 18:00 5.50m at 08:00		0				200 bls	27	35.50 35.77 35.82	-10.62 -11.12	35.50 36.00	V		Very weak, brown (7.5YR/5/4), completely decomposed METATUFF. (Stiff, sandy silty CLAY with some angular fine to coarse gravel)
37		3.20m at 18:00		94	55	41	NI 18.5		T2101		-11.52	36.40	III II		Strong, grey, slightly decomposed coarse ash METATUFF. Joints are and very closely to medium spaced, rough planar to stepped, very narrow, kaolin (<1mm) coated, dipping at 5°-15°, 25°-35° and 40°-50°. 36.00 - 36.40m : Moderately strong, and moderately decomposed TUFF.
38										37.52	-12.64	37.52			End of investigation hole at 37.52m.
39															
40															

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 04/01/2012
CHECKED S.C. Wong
DATE 07/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH13**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **6**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828528.74**
N **841324.53**

DATE from: **13/01/2012** to **28/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 18.73** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
11				82				39 bls	10	Disturbed	10.50					As sheet 1 of 6.
									11	Disturbed	10.83 11.00					
12								â								
13								144 bls	12	Disturbed	13.00					
									13	Disturbed	13.45 13.50					
14																
15																
16				85				41 bls	14	Disturbed	15.50					
									15	Disturbed	15.95 16.00					
17																
18								196 bls	16	Disturbed	18.00	0.73	18.00			
									17	Disturbed	18.45 18.50					
19																
20																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 28/01/2012
CHECKED S.C. Wong
DATE 28/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH13**

CONTRACT No.: **GE/2010/01**

SHEET: **4** of **6**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828528.74**

DATE from: **13/01/2012** to **28/01/2012**

N **841324.53**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 18.73** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
31				100				67 bis	26	Diagonal lines	30.50					As sheet 3 of 6.
									27	Star	30.95 31.00					
32																
		1.30m at 18:00														
33		6.25m at 08:00		100				59 bis	28	Diagonal lines	33.00					
									29	Star	33.45 33.50					
34																
35																
36				100				96 bis	30	Diagonal lines	35.00					
									31	Star	35.65 36.00					
37																
38				100				116 bis	32	Diagonal lines	38.00					
									33	Star	38.45 38.50					
39																
40																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 28/01/2012
 CHECKED S.C. Wong
 DATE 28/01/2012

REMARKS



FUGRO
GEOTECHNICAL
SERVICES LTD

DRILLHOLE RECORD

HOLE No. **KTN-ASBH13**

CONTRACT No.: **GE/2010/01**

SHEET: **5** of **6**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828528.74**

DATE from: **13/01/2012** to **28/01/2012**

N **841324.53**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 18.73** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
											-21.27	40.00		V	As sheet 3 of 6.
41				100				119 bls	34	Diagonal lines	40.50	40.50		V	Extremely weak, greyish brown (10YR/5/2) to brown (7.5YR/5/4), dappled black, completely decomposed coarse ash METATUFF. (Stiff, slightly sandy, clayey SILT)
									35	Diagonal lines	40.95 41.00				
42															
43		1.30m at 18:00 6.30m at 08:00		80				121 bls	36	Diagonal lines	43.00				
									37	Diagonal lines	43.45 43.50				
44															
45															
46				100				123 bls	38	Diagonal lines	45.50				
									39	Diagonal lines	45.95 46.00				
47															
48				100				103 bls	40	Diagonal lines	48.00				
									41	Diagonal lines	48.45 48.50				
49															
50											-31.27	50.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang

DATE 28/01/2012

CHECKED S.C. Wong

DATE 28/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH13**

CONTRACT No.: **GE/2010/01**

SHEET: **6** of **6**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828528.74**

DATE from: **13/01/2012** to **28/01/2012**

N **841324.53**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 18.73** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
											-31.27	50.00		V	As sheet 5 of 6.
51		2.20m at 18:00		100				169 bis	42	50.90	-31.77	50.50		V	Extremely weak, grey (7.5YR/6/1), completely decomposed coarse ash METATUFF. (Stiff, slightly sandy, clayey SILT)
		6.50m at 08:00							43	50.95	51.00				
52															
53	HW 52.90			0				200 bis	44	52.70	-33.97	52.70		IV	Weak, grey, highly decomposed coarse ash METATUFF. Recovered as slightly sandy angular fine to coarse gravel and cobbles.
							NI 20.0			52.85	-34.17	52.90		III	
54		2.20m at 18:00		70	24	0	NI				-34.52	53.25		IV	Moderately weak, greyish brown to brown, moderately decomposed coarse ash METATUFF. Joints are very closely to closely spaced, rough planar to rough stepped, narrow, iron and manganese oxide stained, dipping at 5°-15° and 25°-35°.
							17.5				-35.17	53.90		III	
55															53.25 - 53.90m : Weak, highly decomposed coarse ash METATUFF. Recovered as slightly sandy, clayey silt with some angular fine to medium gravel. End of investigation hole at 54.30m.
56															
57															
58															
59															
60															

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 78mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zheng

DATE 28/01/2012

CHECKED S.C. Wong

DATE 28/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH14a**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **3**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-36**

E **828186.84**
N **840512.46**

DATE from: **12/12/2011** to **30/12/2011**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 12.45** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
14/12/2011	SW								1	INSPECTION PIT	0.50	11.95	0.50			Firm, reddish brown (5YR/4/3), slightly sandy, silty CLAY. (FILL) 0.00 - 0.50m : With some angular fine to medium gravel of quartz.
14/12/2011		0.80m at 08:00						22 bls	4		3.00	9.45	3.00			Firm, light brownish grey (2.5Y/6/2), very sandy, silty CLAY. (ALLUVIUM)
14/12/2011								158 bls	6		5.50	6.95	5.50	V		Extremely weak, brown (7.5YR/5/4) to brownish grey (10YR/5/2), completely decomposed METATUFF. (Very stiff, slightly sandy SILT)
14/12/2011	SW 5.50 PW							254 bls	8		8.50	3.95	8.50			8.50 - 8.80m : With white quartz vein.
15/12/2011		1.50m at 18:00									8.75	3.65	8.80			
16/12/2011		1.50m at 08:00														
10											2.45		10.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip



















LOGGED P. Zhang
DATE 30/12/2011
CHECKED S.C. Wong
DATE 03/01/2012

REMARKS
1. An inspection pit was excavated to a depth of 1.50m.
2. Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.), 15.00m (1 no.) and 25.73m (1 no.) below existing ground level on 14/12/2011, 16/12/2011 and 23/12/2011 respectively.
3. Environmental monitoring well was installed at 6.00m below existing ground level on 29/12/2011 and groundwater sampling was carried out on 12/01/2012.

PROJECT: Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation

METHOD: Rotary Drilling	CO-ORDINATES:	WORKS ORDER No. GE/2010/01.38
MACHINE & No.: FDR-36	E 828186.84 N 840512.46	DATE from: 12/12/2011 to 30/12/2011
FLUSHING MEDIUM: Water	ORIENTATION: Vertical	GROUND LEVEL + 12.45 mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
11								91 bis	9	10.50						As sheet 1 of 3.
									10	10.95 11.00						
12																
13								234 bis	11	13.00						
									12	13.45 13.50						
14																
15																
16		1.30m at 18:00 1.20m at 08:00						200 bis	13	15.50						
									14	15.70 15.75						
17																
18	PW 18.00 HW							210 bis	15	18.00 18.18 18.23	-5.55	18.00		V	Very weak, brownish grey (10YR/5/2), completely decomposed METATUFF. (Slightly sandy, silty angular fine to coarse GRAVEL)	
19																
20											-7.55	20.00				

<ul style="list-style-type: none">  Small Disturbed Sample  Piston sample  U76 Undisturbed Sample  U100 Undisturbed Sample  Mazier Sample  76mm Vibrocore Sample  100mm Vibrocore Sample  Vibrocore Sub-sample  SPT Liner Sample 	<ul style="list-style-type: none">  Standard Penetration Test  In-situ Vane Shear Test  Permeability Test  Pressuremeter Test  Televue Survey  Packer Test  Impression Packer Test  Water Sample  Standpipe Piezometer Tip 	<p>LOGGED <u>P. Zhang</u></p> <p>DATE <u>30/12/2011</u></p> <p>CHECKED <u>S.C. Wong</u></p> <p>DATE <u>03/01/2012</u></p>	<p>REMARKS</p>
--	---	---	----------------



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH14a**

CONTRACT No.: **GE/2010/01**

SHEET: **3** of **3**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-36**

E **828186.84**

DATE from: **12/12/2011** to **30/12/2011**

N **840512.46**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 12.45** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
	HW 20.63			0							-7.55	20.00		V	As sheet 2 of 3.
21				92	92	63	NI	200 bls	16	T2101	-8.05 -8.18	20.50 20.63		II	20.50 - 20.63m : With white quartz vein. Strong, grey, spotted white, slightly decomposed coarse ash METATUFF. Joints are closely to medium, occasionally very closely spaced, rough planar to stepped, very narrow, iron oxide stained, kaolin (<2mm) coated, dipping at 5°-15° and 21°-35°.
22		1.30m at 18:00 20/12/2011 1.20m at 08:00 22/12/2011								T2101		22.16			
23				100	79	53	NI			T2101		23.55			
24		1.00m at 18:00 22/12/2011 1.50m at 08:00 23/12/2011								T2101		25.03			
25		1.00m at 18:00 23/12/2011		100	86	66				T2101		25.73	-13.28	25.73	
26															End of investigation hole at 25.73m.
27															
28															
29															
30															

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 30/12/2011
 CHECKED S.C. Wong
 DATE 03/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH14b**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828209.61**
N **840750.92**

DATE from: **10/12/2011** to **29/12/2011**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 17.81** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
13/12/2011	SW								1	INSPECTION PIT	0.50	17.81	0.00		V	Extremely weak to weak, reddish brown (5YR/4/3), mottled yellow, completely decomposed METATUFF. (Stiff, slightly sandy, clayey SILT)
									2	INSPECTION PIT	1.50					
									3	INSPECTION PIT	1.50					
13/12/2011 16/12/2011																Extremely weak, pinkish brown (2.5YR/7/4) to yellowish brown (10YR/5/6), completely decomposed METATUFF. (Stiff, slightly sandy, clayey SILT)
								35 bls	4		3.00	14.81	3.00		V	
																Extremely weak, brownish red (5YR/4/3), spotted white, completely decomposed METATUFF. (Stiff, slightly sandy, clayey SILT)
	SW 5.50 PW							92 bls	6		5.50				V	
									7		5.95 6.00					
								63 bls	8		8.00	9.81	8.00		V	
									9		8.45 8.50					
10												7.81	10.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 29/12/2011
CHECKED S.C. Wong
DATE 03/01/2012

REMARKS
1. An inspection pit was excavated to a depth of 1.50m.
2. Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.), 20.50m (3 nos.) and 46.00m (1 no.) below existing ground level on 16/12/2011, 20/12/2011 and 23/12/2011 respectively.
3. Environmental monitoring well was installed at 11.00m below existing ground level on 29/12/2011 and groundwater sampling was carried out on 11/01/2012.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH14b**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828209.61**
N **840750.92**

DATE from: **10/12/2011** to **29/12/2011**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 17.81** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
												7.81	10.00		V	As sheet 1 of 5.
11				89				91 bis	10	█	10.50		7.31	10.50	V	Extremely weak to very weak, yellowish brown (10YR/5/6) to brown (7.5YR/5/4), locally mottled white, completely decomposed METATUFF. (Very stiff, slightly sandy, clayey SILT)
									11	█	10.95		11.00			
12																
13																
14																
15																
16																
17																
18																
19																
20																

	Small Disturbed Sample		Standard Penetration Test
	Piston sample		In-situ Vane Shear Test
	U78 Undisturbed Sample		Permeability Test
	U100 Undisturbed Sample		Pressuremeter Test
	Mazier Sample		Televiwer Survey
	78mm Vibrocore Sample		Packer Test
	100mm Vibrocore Sample		Impression Packer Test
	Vibrocore Sub-sample		Water Sample
	SPT Liner Sample		Standpipe
			Piezometer Tip

LOGGED P. Zhang
DATE 29/12/2011
CHECKED S.C. Wong
DATE 03/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH14b**

CONTRACT No.: **GE/2010/01**

SHEET: **3** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828209.61**
N **840750.92**

DATE from: **10/12/2011** to **29/12/2011**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 17.81** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description	
									No.	Type	Depth						
19/12/2011 20/12/2011		2.00m at 18:00 5.65m at 08:00															
21				100				91 bls	18	Diagonal	20.50						As sheet 2 of 5.
									19	Diagonal	20.95 21.00						
22																	
23				100				60 bls	20	Diagonal	23.00						
									21	Diagonal	23.45 23.50						
24																	
25																	
26				100				107 bls	22	Diagonal	25.50						
									23	Diagonal	25.95 26.00						
27																	
28				100				123 bls	24	Diagonal	28.00						
									25	Diagonal	28.45 28.50						
29																	
30																	

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiever Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 29/12/2011
CHECKED S.C. Wong
DATE 03/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH14b**

CONTRACT No.: **GE/2010/01**

SHEET: **4** of **5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828209.61**

DATE from: **10/12/2011** to **29/12/2011**

N **840750.92**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 17.81** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	F 1	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
20/12/2011 21/12/2011		3.20m at 18:00 7.16m at 08:00		98				200 bls	26	30.50				V	As sheet 2 of 5.	
									27	30.83 30.93						
32																
33				89				200 bls	28	33.00	-15.19	33.00		IV	Very weak, greyish brown, highly decomposed METATUFF. Recovered as slightly sandy, silty clayey angular medium to coarse gravel and cobbles. 33.00 - 33.28m : With some quartz vein.	
									29	33.23 33.28	-15.47	33.28				
34																
35																
36				82				200 bls	30	35.50						
									31	35.80 35.85						
37																
38				80				200 bls	32	38.00	-20.19	38.00		V	Extremely weak, brownish grey (10YR/5/2) and light brown (7.5YR/6/3) to brown (7.5YR/5/4), completely decomposed METATUFF. (Very stiff, slightly sandy, clayey SILT)	
									33	38.45 38.50						
39																
40											-22.19	40.00				

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocure Sample
- 100mm Vibrocure Sample
- Vibrocure Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 29/12/2011
 CHECKED S.C. Wong
 DATE 03/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH14b**

CONTRACT No.: **GE/2010/01**

SHEET: **5 of 5**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-35**

E **828209.61**
N **840750.92**

DATE from: **10/12/2011** to **29/12/2011**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 17.81** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	T C R %	S C R %	R Q D %	F I	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
41		6.20m at 18:00 8.10m at 08:00		100				118 bls	34	U76	40.50		40.00		V	As sheet 4 of 5.
42									35	U100	40.95 41.00					
43				89				200 bls	36	U76	43.00					
44									37	U100	43.45 43.50					
45																
46		7.00m at 18:00 7.30m at 08:00 6.80m at 18:00		84				200 bls	38	U76	45.50				End of investigation hole at 46.00m.	
47									39	U100	45.95 46.00					
48																
49																
50																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 78mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 29/12/2011
CHECKED S.C. Wong
DATE 03/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH15**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **3**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-07**

E **827686.98**
N **840537.71**

DATE from: **23/12/2011** to **06/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 11.81** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
28/12/2011	SW											11.81	0.00			
1									1	INSPECTION PIT	0.50	11.31	0.50			Firm, grey (7.5YR/6/1), slightly sandy, silty CLAY with some angular fine to medium gravel of moderately weak tuff and quartz. (FILL)
									2	INSPECTION PIT	0.50	10.81	1.00			Firm, dark grey (5YR/4/1), mottled grey, slightly sandy, silty CLAY with occasional angular fine gravel of quartz. (FILL)
28/12/2011 29/12/2011									3	INSPECTION PIT	1.50					Firm, grey (7.5YR/6/1), silty CLAY with occasional angular fine to medium gravel of quartz. (FILL)
3	SW 3.00 PW	2.00m at 18:00 2.80m at 08:00		100				55 bls	4		3.00	8.81	3.00			Light grey (10R/7/1), mottled dark grey, slightly clayey, sandy angular fine to coarse GRAVEL of quartz. (FILL)
28/12/2011 30/12/2011									5		3.45 3.50					
4								200 bls	6		5.50	6.31	5.50	V		Extremely weak, purplish brown (7.5R/3/3), completely decomposed METATUFF. (Stiff, slightly sandy, clayey SILT)
5									7		5.88 5.93					
6								200 bls	8		8.00	3.81	8.00	V		Very weak, brown (7.5YR/5/4), completely decomposed METATUFF. (Slightly silty, clayey sandy angular fine to coarse gravel)
7									9		8.28 8.31					
8								200 bls								
9																
10												1.81	10.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiewer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 04/01/2012
CHECKED S.C. Wong
DATE 07/01/2012

REMARKS
1. An inspection pit was excavated to a depth of 1.50m.
2. Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.), 20.50m (3 nos.) and 27.50m (1 no.) below existing ground level on 29/12/2011, 03/01/2012 and 04/01/2012 respectively.
3. Environmental monitoring well was installed at 6.00m below existing ground level on 05/01/2012 and groundwater sampling was carried out on 03/02/2012.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH15**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **3**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-07**

E **827686.98**
N **840537.71**

DATE from: **23/12/2011** to **06/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 11.81** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
											1.81	10.00			
	PW 10.50 HW	1.70m at 18:00 1.50m at 08:00						200 bls	10		10.50	10.50		V	As sheet 1 of 3.
								200 bls	11		10.81 10.86	10.50		V	Extremely weak, brown (7.5YR/5/4) to yellowish brown (10YR/5/6), completely decomposed METATUFF. (Very stiff, sandy SILT with occasional angular fine to medium gravel)
								200 bls	12		13.00 13.10 13.15	-1.19 13.00		IV	Very weak, brownish grey to brown, highly decomposed METATUFF. Recovered as slightly silty, sandy angular fine to coarse gravel and cobbles.
		0.20m at 18:00 2.20m at 08:00						200 bls	13		15.50 15.59 15.64				
								200 bls	14		18.00	-6.19 18.00		V	Extremely weak, brownish yellow (10YR/6/8), completely decomposed METATUFF. (Very stiff, slightly sandy, clayey SILT with occasional angular fine gravel)
									15		18.25 18.30				
											-8.19	20.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 04/01/2012
CHECKED S.C. Wong
DATE 07/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH15**

CONTRACT No.: **GE/2010/01**

SHEET: **3 of 3**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-07**

E **827686.98**
N **840537.71**

DATE from: **23/12/2011** to **06/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**


GROUND LEVEL **+ 11.81** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
		0.20m at 18:00									-8.19	20.00		V	As sheet 2 of 3.
21		3.00m at 08:00		87				200 bis	16	20.50	-8.69	20.50		V	Very weak, grey (7.5YR/6/1) to brownish grey (10YR/5/2), completely decomposed METATUFF. (Very stiff, slightly sandy, clayey SILT with some angular fine to coarse gravel)
22									17	20.73 20.78					
23				89				200 bis	18	23.00	-11.19	23.00			
24									19	23.25 23.30	-11.44	23.25			23.00 - 23.25m : With occasional cobbles.
25															
26				91				200 bis	20	25.50					
27	HW 27.00	1.20m at 18:00		84	30	30	NI							III	Moderately weak to moderately strong, brown and grey, moderately decomposed coarse ash METATUFF. Very closely fractured, recovered as angular fine to coarse gravel and cobbles.
28							12.0		72101	27.00	-15.19	27.00			
29										27.50	-15.69	27.50			End of investigation hole at 27.50m.
30												30.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televue Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 04/01/2012
CHECKED S.C. Wong
DATE 07/01/2012




















REMARKS

 FUGRO GEOTECHNICAL SERVICES LTD	DRILLHOLE RECORD	HOLE No. KTN-ASBH20
	CONTRACT No.: GE/2010/01	SHEET: 2 of 4

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: Rotary Drilling	CO-ORDINATES:	WORKS ORDER No. GE/2010/01.38
MACHINE & No.: FDR-13	E 828871.90 N 840623.70	DATE from: 06/01/2012 to 14/01/2012
FLUSHING MEDIUM: Water	ORIENTATION: Vertical	GROUND LEVEL + 6.26 mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	F I	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
											-3.74	10.00		V	As sheet 1 of 4.
11				89				49 bls	12	10.50	-4.24	10.50		V	Extremely weak, greyish brown (10YR/5/2) to yellowish brown (10YR/5/6), completely decomposed coarse ash METATUFF. (Firm to stiff, clayey SILT)
									13	10.55 11.00					
12															
13		1.00m at 18:00													
14		1.60m at 08:00		89				50 bls	14	13.00					
									15	13.45 13.50					
15															
16				100				70 bls	16	15.50					
									17	15.95 16.00					
17															
18				100				80 bls	18	18.00					
									19	18.45 18.50					
19															
20											-13.74	20.00			

 Small Disturbed Sample  Piston sample  U76 Undisturbed Sample  U100 Undisturbed Sample  Mazier Sample  76mm Vibrocore Sample  100mm Vibrocore Sample  Vibrocore Sub-sample  SPT Liner Sample	 Standard Penetration Test  In-situ Vane Shear Test  Permeability Test  Pressuremeter Test  Televiwer Survey  Packer Test  Impression Packer Test  Water Sample  Standpipe  Piezometer Tip	LOGGED <u>P. Zhang</u> DATE <u>19/01/2012</u> CHECKED <u>S.C. Wong</u> DATE <u>31/01/2012</u>	REMARKS
--	---	--	----------------



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH20**

CONTRACT No.: **GE/2010/01**

SHEET: **3** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-13**

E **828871.90**
N **840623.70**

DATE from: **06/01/2012** to **14/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 6.26** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description	
									No.	Type						Depth
21				100				181 bls	20	20.50				V	As sheet 2 of 4.	
									21	20.55 21.00						
22																
23				89				200 bls	22	23.00						
									23	23.43 23.48						
24																
25		1.20m at 18:00														
26		1.40m at 08:00		100				128 bls	24	25.50	-19.24	25.50		V		Extremely weak, light greyish brown (10YR/5/2), completely decomposed coarse ash METATUFF. (Stiff, slightly sandy, clayey SILT)
									25	25.95 26.00						
27																
28				100				100 bls	26	28.00	-21.74	28.00		V		Extremely weak, brown (7.5YR/5/4) to dark brown (7.5YR/3/4), completely decomposed coarse ash METATUFF. (Stiff, slightly sandy, clayey SILT)
									27	28.45 28.50						
29																
30											-23.74	30.00				

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 19/01/2012
CHECKED S.C. Wong
DATE 31/01/2012

REMARKS



FUGRO
GEOTECHNICAL
SERVICES LTD

DRILLHOLE RECORD

HOLE No. **KTN-ASBH20**

CONTRACT No.: **GE/2010/01**

SHEET: **4** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-13**

E **828871.90**

N **840623.70**

DATE from: **06/01/2012** to **14/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 6.26** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	F I	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description	
									No.	Type						
31				89				117 bts	28	30.50				V	As sheet 3 of 4.	
32									29	30.95 31.00						
33		0.90m at 18:00 3.10m at 08:00		0				200 bts	30	33.00 33.25 33.30	-26.74	33.00		V	Extremely weak, light brown (7.5YR/6/3) to white (8N), completely decomposed coarse ash METATUFF. (Angular coarse GRAVEL of quartz)	
34																
35																
36				87				200 bts	31	35.50	-29.24	35.50		V	Extremely weak, grey (7.5YR/6/1), completely decomposed coarse ash METATUFF. (Stiff, slightly sandy, clayey SILT)	
37																
38		HW 37.75		60	93	21	14	NI				37.75	-31.49	37.75	III	Strong, brownish grey to grey, dappled white, slightly decomposed coarse ash METATUFF.
39				60	100	57	48	NI				38.45	-32.19	38.45	III	Joints are closely to medium, occasional very closely spaced, rough planar and stepped, very narrow kaolin coated (<1mm), dipping at 5°-15°, 25°-35° and 45°-55°.
40		2.00m at 18:00					7.3					39.50	-32.69	38.95	II	37.75 - 38.15m : Moderately strong, moderately decomposed, very closely fractured.
												39.50	-33.24	39.50		38.45 - 38.95m : Moderately strong, moderately decomposed, very closely fractured.
												40.00				End of investigation hole at 39.50m

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang

DATE 19/01/2012

CHECKED S.C. Wong

DATE 31/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH21**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-07**

E **828980.28**
N **840714.28**

DATE from: **07/01/2012** to **18/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 5.86** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
10/01/2012	SW										5.86	0.00			
1									1	INSPECTION PIT	5.66	0.20	△		Grey, CONCRETE slab.
									2	INSPECTION PIT	4.86	1.00	⊗		Firm, dark grey (5YR/4/1), slightly sandy, clayey SILT. (FILL)
									3	INSPECTION PIT	4.36	1.50	⊗		Firm, brownish grey (10YR/5/2), slightly sandy, silty CLAY. (FILL)
10/01/2012 17/01/2012															White (8N), angular medium to coarse GRAVEL and COBBLES of quartz. (ALLUVIUM)
3	SW 3.00 PW			44				44 bls	4		3.00				
4									5		3.45 3.50				
6				65				65 bls	6		5.50	0.36	5.50		Grey (7.5YR/6/1), slightly clayey, silty fine to coarse SAND with some angular fine to coarse gravel of quartz. (ALLUVIUM)
7									7		5.65 5.90				
8				35				35 bls	8		8.00	-2.14	8.00	V	Extremely weak, greyish brown (10YR/5/2), completely decomposed coarse ash METATUFF. (Firm, silty CLAY)
9									9		8.45 8.60				
10											-4.14	10.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 19/01/2012
CHECKED S.C. Wong
DATE 31/01/2012

REMARKS

- An inspection pit was excavated to a depth of 1.50m.
- Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.), 18.00m (3 nos.) and 33.00m (1 no.) below existing ground level on 10/01/2012, 12/01/2012 and 14/01/2012 respectively.
- Environmental monitoring well was installed at 9.00m below existing ground level on 17/01/2012 and groundwater sampling was carried out on 03/02/2012.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH21**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-07**

E **828980.28**

DATE from: **07/01/2012** to **18/01/2012**

N **840714.28**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 5.86** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
	PW 10.50 HW	3.20m at 18:00 1.50m at 08:00									-4.14	10.00		V	As sheet 1 of 4.
11 12/01/2012								76 bls	10	10.50	-4.64	10.50		V	Extremely weak, brown (7.5YR/5/4) to greyish brown (10YR/5/2), completely decomposed coarse ash METATUFF. (Firm to stiff, clayey SILT)
									11	10.95		11.00			
12															
13								67 bls	12	13.00		13.00			
									13	13.45		13.50			
14															
15															
16								111 bls	14	15.50		15.50			
									15	15.95		16.00			
17															
18 12/01/2012		0.70m at 18:00 2.30m at 08:00						200 bls	16	18.00	-12.14	18.00		V	
									17	18.34		18.39			
19															Extremely weak, dark brown (7.5YR/3/4), completely decomposed coarse ash METATUFF. (Firm, slightly sandy, silty CLAY with some angular fine to medium gravel of quartz)
20															

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 19/01/2012
 CHECKED S.C. Wong
 DATE 31/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH21**

CONTRACT No.: **GE/2010/01**

SHEET: **3** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-07**

E **828980.28**
N **840714.28**

DATE from: **07/01/2012** to **18/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 5.86** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description	
									No.	Type	Depth						
																As sheet 2 of 4.	
21				67				83 bls	18	20.50		-14.64	20.50		V	Extremely weak, yellowish brown (10YR/5/6), completely decomposed coarse ash METATUFF. (Firm to stiff, slightly sandy, clayey SILT)	
								19	20.95 21.00						V		
23				100				138 bls	20	23.00							
									21	23.45 23.50							
26				100				138 bls	22	25.50							
									23	25.95 26.00							
28				100				105 bls	24	28.00							
									25	28.45 28.50							
29		1.50m at 18:00 3.50m at 08:00															
30																	

	Small Disturbed Sample		Standard Penetration Test
	Piston sample		In-situ Vane Shear Test
	U76 Undisturbed Sample		Permeability Test
	U100 Undisturbed Sample		Pressuremeter Test
	Mazier Sample		Televiometer Survey
	76mm Vibrocore Sample		Packer Test
	100mm Vibrocore Sample		Impression Packer Test
	Vibrocore Sub-sample		Water Sample
	SPT Liner Sample		Standpipe
			Piezometer Tip

LOGGED P. Zhang
DATE 19/01/2012
CHECKED S.C. Wong
DATE 31/01/2012

REMARKS



FUGRO
GEOTECHNICAL
SERVICES LTD

DRILLHOLE RECORD

HOLE No. **KTN-ASBH21**

CONTRACT No.: **GE/2010/01**

SHEET: **4** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-07**

E **828980.28**
 N **840714.28**

DATE from: **07/01/2012** to **18/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 5.86** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
31								200 bls	26	30.50						As sheet 3 of 4.
									27	30.76 30.81						
32																
33	HW 33.00	2.80m at 18:00						100 bls	28	33.00						End of investigation hole at 33.50m.
									29	33.45 33.60	-27.64	33.50				
34																
35																
36																
37																
38																
39																
40																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 19/01/2012
 CHECKED S.C. Wong
 DATE 31/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH29**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **1**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-30**

E **828857.09**
N **841205.56**

DATE from: **31/01/2012** to **07/02/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 11.26** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	T C R %	S C R %	R Q D %	F I	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
01/02/2012	PW										11.26	0.00				Firm, grey brown (10YR/5/2), slightly sandy, clayey SILT with occasional roots. (TOP SOIL)
1		Dry at 18:00							1	INSPECTION PIT	8.85	10.76	0.50			Firm, brown (7.5YR/5/4) to reddish brown (5YR/4/3), slightly sandy, clayey SILT with occasional angular fine to medium quartz gravel. (COLLUVIUM)
01/02/2012 03/02/2012		Dry at 08:00							2	INSPECTION PIT	9.85					
2									3	INSPECTION PIT	1.65					
3								40 bls	4		3.00	8.26	3.00	V		Extremely weak, brownish red (5YR/4/3), mottled white, completely decomposed fine ash METATUFF. (Firm, clayey SILT)
4									5		3.45 3.50					
5								46 bls	6		5.50					
03/02/2012 04/02/2012		0.80m at 18:00 1.00m at 08:00							7		5.35 6.00					
6																
7																
8	PW 8.00	0.50m at 18:00						42 bls			8.00	3.26	8.00	V		Extremely weak, brown (7.5YR/5/4), completely decomposed fine ash METATUFF. (Firm, slightly sandy, clayey SILT)
04/02/2012									8		8.45 8.50	2.76	8.50			End of investigation hole at 8.50m.
9																
10																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 10/02/2012
CHECKED S.C. Wong
DATE 13/02/2012

REMARKS

- An inspection pit was excavated to a depth of 1.50m.
- Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.) and 8.50m (1 no.) below existing ground level on 02/02/2012 and 04/02/2012 respectively.
- Environmental monitoring well was installed at 7.00m below existing ground level on 06/02/2012 and groundwater sampling was carried out on 08/02/2012.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH32**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **3**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-36**

E **828284.40**
N **841522.19**

DATE from: **11/01/2012** to **18/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 17.61** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
12/01/2012	SW										17.61	0.00			
1									1	INSPECTION PIT	17.11	0.50		V	Firm, reddish brown (5YR/4/3), slightly sandy, silty CLAY. (FILL)
									2	INSPECTION PIT	18.85				Firm, dark grey (5YR/4/1), slightly sandy, silty CLAY with some angular fine to coarse gravel of weak to moderately weak tuff. (FILL)
									3	INSPECTION PIT	16.11	1.50			
12/01/2012 13/01/2012															
2								200 bits	4		3.00		V	Extremely weak, grey (7.5YR/6/1), completely decomposed METASANDSTONE. (Silly fine SAND)	
									5		3.30 3.35				
3									6		5.50		V	Extremely weak, reddish brown (5YR/4/3), completely decomposed METASILTSTONE. (Firm, clayey SILT)	
									7		5.55 6.00				
4									8		9.61		V	Extremely weak, brown (7.5YR/5/4), completely decomposed METASILTSTONE. (Stiff, slightly clayey, sandy SILT with some angular fine to coarse gravel)	
									9		8.37 8.42				
5															
6															
7															
8															
9															
10															

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 21/01/2012
CHECKED S.C. Wong
DATE 21/01/2012

REMARKS

- An inspection pit was excavated to a depth of 1.50m.
- Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.), 18.00m (3 nos.) and 24.86m (1 no.) below existing ground level on 13/01/2012, 14/01/2012 and 17/01/2012 respectively.
- Environmental monitoring well was installed at 7.00m below existing ground level on 18/01/2012 and groundwater sampling was carried out on 06/02/2012.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH32**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **3**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-36**

E **828284.40**

DATE from: **11/01/2012** to **18/01/2012**

N **841522.19**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 17.61** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	F I	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
11	SW 10.50 PW	1.00m at 18:00 1.40m at 08:00		44				88 bfs	9	10.50		7.81	10.00		V	As sheet 1 of 3.
12									10	10.95 11.00						
13	PW 13.00 HW			44				163 bis	11	13.00	4.61		13.00		V	Extremely weak, yellowish brown (10YR/5/6) to brown (7.5YR/5/4), completely decomposed METASILTSTONE. (Firm, clayey SILT)
14									12	13.45 13.50						
15																
16				0				110 bis	13	15.50 15.95 16.00						
17																
18																
19		1.30m at 18:00 1.50m at 08:00		44				200 bis	14	18.00	-0.39		18.00		V	Very weak, dark reddish brown (2.5YR/3/4), completely decomposed METASILTSTONE. (Stiff, slightly sandy, clayey SILT with some angular fine to coarse gravel)
20									15	18.38 18.43						

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 21/01/2012
 CHECKED S.C. Wong
 DATE 21/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH32**

CONTRACT No.: **GE/2010/01**

SHEET: **3 of 3**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-36**

E **828284.40**
N **841522.19**

DATE from: **11/01/2012** to **18/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 17.61** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
											-2.39	20.00		V	As sheet 2 of 3.
21				0				200 bis	16	20.50	-2.69	20.50		IV	Weak, grey, highly decomposed METASILTSTONE. Recovered as angular cobbles.
22	HW 21.70		70	90	25	25		T2101		21.70	-4.09	21.70		III	Moderately weak to moderately strong, grey, moderately decomposed METASILTSTONE. Non-intact, recovered as angular fine to coarse gravel with some cobbles.
23			70	51	3	0	NI	T2101		23.20	-5.59	23.20		IV	23.20 - 23.50m : Weak, highly decomposed METASILTSTONE.
24	1.40m at 18:00 1.50m at 08:00		70	92	65	22	13.2	T2101		23.66	-5.89 -5.99	23.50 23.60		II	Moderately strong to strong, grey, slightly decomposed METASILTSTONE. Joints are very closely to closely spaced, rough and smooth planar, very narrow, iron oxide stained and chlorite coated, dipping at 5°-15° and 25°-35°.
25	1.50m at 18:00						>20			24.86	-7.25	24.86			End of investigation hole at 24.86m.
26															
27															
28															
29															
30												30.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 21/01/2012
CHECKED S.C. Wong
DATE 21/01/2012

REMARKS



FUGRO
GEOTECHNICAL
SERVICES LTD

DRILLHOLE RECORD

HOLE No. **KTN-ASBH38**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **2**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-38**

E **828996.18**
 N **840532.15**

DATE from: **17/01/2012** to **31/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 6.96** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	T C R %	S C R %	R Q D %	F I	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
18/01/2012	PW										6.96	0.00			
1									1	INSPECTION PIT		0.85			Firm, dark brownish grey (10YR/4/2), sandy SILT with some angular fine to coarse gravel of moderately weak to moderately strong tuff and granite. (FILL)
									2		5.96	1.00			Brown (7.5YR/5/4), slightly silty fine to coarse SAND with occasional angular fine quartz gravel. (FILL)
									3		5.46	1.50			Brownish grey (10YR/5/2), slightly silty fine to coarse SAND with some angular fine to medium gravel of strong quartz. (ALLUVIUM)
2															
3								20 bls	4			3.00			
									5			3.45 3.50			
4															
5															
6								70 bls	6			6.50	1.46	5.50	White (8N), slightly silty, clayey sandy angular fine to coarse GRAVEL of strong quartz. (ALLUVIUM)
18/01/2012 19/01/2012	PW HW	2.60m at 18:00 4.80m at 08:00		0											
7															
8								89 bls	7			8.00	-1.04	8.00	Extremely weak, dark yellowish brown (10YR/4/6), completely decomposed coarse ash METATUFF. (Firm, slightly sandy SILT)
9									8			8.50 8.55			
10												3.04	10.00		

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 31/01/2012
 CHECKED S.C. Wong
 DATE 31/01/2012

REMARKS

- An inspection pit was excavated to a depth of 1.50m.
- Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.), 10.50m (3 nos.) and 17.87m (1 no.) below existing ground level on 18/01/2012, 19/01/2012 and 20/01/2012 respectively.
- Environmental monitoring well was installed at 10.00m below existing ground level on 31/01/2012 and groundwater sampling was carried out on 08/02/2012.
- Coordinates refer to monitoring well installation location.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH38**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **2**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-38**

E **828996.18**
N **840532.15**

DATE from: **17/01/2012** to **31/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 6.96** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
											-3.04	10.00		V	As sheet 1 of 2.	
11				6				122 bts	9	10	10.50 10.95 11.00	-3.54	10.50	V	Extremely weak, light grey (10R/7/1), completely decomposed coarse ash METATUFF. (Stiff, slightly sandy SILT with some angular fine to medium gravel)	
12																
13				6				200 bts	11	12	13.00 13.24 13.29					
14																
15																
16		4.15m at 18:00 4.15m at 08:00	0					200 bts	13		15.50 15.55 15.70					
17	HW 16.60		70	98	57	41	7.1				16.60	-9.64	16.60	III	Moderately strong, grey, moderately decomposed coarse ash METATUFF. Joints are very closely to closely spaced, rough planar and stepped, very narrow, kaolin coated (<1mm) and clean, dipping at 10°-20°, 30°-40° and 55°-65°.	
18											17.87	-10.91	17.87		End of investigation hole at 17.87m.	
19																
20													20.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 31/01/2012
CHECKED S.C. Wong
DATE 31/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH Offsite**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-38**

E **827788.67**
N **840977.39**

DATE from: **20/12/2011** to **04/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 26.40** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
22/12/2011	SW										26.40	0.00			
1									1	INSPECTION PIT	25.90	0.50			Firm, dark grey (5YR/4/1), sandy SILT with some angular fine to medium gravel of moderately weak tuff, glass and occasional asphalt fragments. (FILL)
2									2						Firm, yellowish brown (10YR/5/6) to reddish brown (5YR/4/3), slightly sandy, clayey SILT with some angular fine to coarse gravel and cobbles of moderately weak tuff. (COLLUVIUM)
22/12/2011 24/12/2011									3						
2															
3				100				123 bls	4		23.40	3.00		V	Extremely weak, pinkish brown (2.5YR/7/4) to purplish brown (7.5R/3/3), mottled light brown, completely decomposed METATUFF. (Firm, clayey SILT)
4									5		3.45 3.50				
24/12/2011 28/12/2011	SW 5.50 PW	2.50m at 18:00 3.55m at 08:00		100				117 bls	6		5.50				
6									7		5.95 6.00				
7															
8				100				82 bls	8		8.00				
9									9		8.45 8.60				
10											16.40	10.00			

- Small Disturbed Sample
- Piston sample
- U78 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 04/01/2012
CHECKED S.C. Wong
DATE 07/01/2012

REMARKS
1. An inspection pit was excavated to a depth of 1.50m.
2. Flushing water samples were taken from the water tank when drilling at 1.50m (1 no.), 15.50m (3 nos.) and 30.85m (1 no.) below existing ground level on 24/12/2011, 29/12/2011 and 30/12/2011 respectively.
3. Environmental monitoring well was installed at 9.00m below existing ground level on 03/01/2012 and groundwater sampling was carried out on 12/01/2012.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH Offsite**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-38**

E **827788.67**

DATE from: **20/12/2011** to **04/01/2012**

N **840977.39**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 26.40** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
											16.40	10.00				As sheet 1 of 4.
11				99				210 bls	10	█	10.50	15.90	10.50		V	Extremely weak to very weak, brown (7.5YR/5/4) to purplish brown (7.5R/3/3), mottled light brown and black, completely decomposed METATUFF. (Very stiff, slightly sandy SILT with occasional angular fine to medium gravel)
									11	↓	10.89 10.94			V		
12	PW 12.00 HW															
13				108				126 bls	12	█	13.00					
									13	↓	13.45 13.50					
15		0.60m at 18:00 29/12/2011 3.60m at 08:00 29/12/2011		100				113 bls	14	▨	15.50					
16									15	↓	15.93 16.00					
18				108				99 bls	16	▨	18.00					
									17	↓	18.45 18.50					
20											6.40	20.00				

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 78mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 04/01/2012
 CHECKED S.C. Wong
 DATE 07/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH Offsite**

CONTRACT No.: **GE/2010/01**

SHEET: **3** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-38**

E **827788.67**
N **840977.39**

DATE from: **20/12/2011** to **04/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 26.40** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level 6.40	Depth (m) 20.00	Legend	Grade	Description
									No.	Type					
21				100				200 bls	18	20.50				V	As sheet 2 of 4.
									19	20.51 20.96					
22															
23				88				200 bls	20	23.00					
									21	23.38 23.41					
24															
25				86				200 bls	22	25.50					
									23	25.79 25.84					
26		1.65m at 18:00													
27		4.90m at 08:00													
28				72	50	38	Nt		T201	27.50	-1.10	27.50		III	Moderately strong, brown, moderately decomposed coarse ash METATUFF.
				74				200 bls	24	28.00	-1.60	28.00		V	Joints are very closely to closely spaced, rough planar, extremely narrow, iron oxide stained, dipping at 5°-15°. (CORESTONE)
									25	28.19 28.24					Very weak, light grey (10R/7/1), spotted brown, completely decomposed METATUFF. (Very stiff, slightly sandy SILT)
29															
30															

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 04/01/2012
CHECKED S.C. Wong
DATE 07/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH Offsite**

CONTRACT No.: **GE/2010/01**

SHEET: **4** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-38**

E **827788.67**
N **840977.39**

DATE from: **20/12/2011** to **04/01/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 26.40** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
	HW 30.50															
		3.20m at 18:00						200 bis	26		30.50	-4.10	30.50		V	As sheet 3 of 4.
31									27		30.85	-4.45	30.85		V	Very weak, greyish brown (10RY/5/2), dappled black, completely decomposed METATUFF. (Very stiff, slightly sandy SILT)
																End of investigation hole at 30.85m.
32																
33																
34																
35																
36																
37																
38																
39																
40																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 04/01/2012
CHECKED S.C. Wong
DATE 07/01/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH Offsite(a)**

CONTRACT No.: **GE/2010/01**

SHEET: **1** of **4**

PROJECT: **Agreement No. GE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-07**

E **827785.80**
N **840973.13**

DATE from: **10/02/2012** to **18/02/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 26.37** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	ROD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
10/02/2012	SW	Dry at 18:00									26.37	0.00			
10/02/2012		Dry at 08:00							1	INSPECTION PIT	25.87	0.50			Dark grey (5YR/4/1), sandy clayey SILT with some angular fine to medium gravel of moderately weak to moderately strong tuff. (FILL)
11/02/2012		Dry at 08:00							2		25.37	1.00			Firm, brownish grey (10YR/5/2), sandy SILT with some angular fine to medium gravel of weak to moderately weak tuff. (COLLUVIUM)
11/02/2012		Dry at 18:00							3		24.87	1.50			Firm, brown (7.5YR/5/4), slightly sandy, clayey SILT with occasional angular fine to medium gravel of weak tuff. (COLLUVIUM)
13/02/2012	SW 2.60	Dry at 08:00	70	95					4		2.50	2.60			Extremely weak, pinkish brown (2.5YR/7/4) to reddish brown (5YR/4/3), spotted white, completely decomposed fine ash METATUFF. (Firm, clayey SILT)
	PW		70	95					5		3.60	3.70			
			70	100					6		3.70	3.90			
			70	100					7		4.80	4.90			
13/02/2012		4.50m at 18:00							9		21.47	4.90			4.90 - 6.00m : With some angular fine to medium gravel of quartz.
14/02/2012		3.50m at 08:00	70	80					10		5.90	6.00			
			70	100					11		7.00	7.10			
			70	100					12		7.10	7.20			
			70	100					13		8.20	8.30			
			70	100					14		18.07	8.30			Weak, yellowish brown, highly decomposed fine ash METATUFF. Recovered as slightly silty, slightly sandy angular fine to coarse gravel and cobbles.
			70	100					15		9.30	9.40			
	PW 9.40		70	100					16		16.37	10.00			
	HW		70	100					17						
			70	100					18						
			70	100					19						

	Small Disturbed Sample		Standard Penetration Test
	Piston sample		In-situ Vane Shear Test
	U76 Undisturbed Sample		Permeability Test
	U100 Undisturbed Sample		Pressuremeter Test
	Mazier Sample		Televue Survey
	76mm Vibrocure Sample		Packer Test
	100mm Vibrocure Sample		Impression Packer Test
	Vibrocure Sub-sample		Water Sample
	SPT Liner Sample		Standpipe
			Piezometer Tip

LOGGED P. Zhang

DATE 28/02/2012

CHECKED S.C. Wong

DATE 29/02/2012

REMARKS

1. An inspection pit was excavated to a depth of 1.50m.
2. Flushing water samples were taken from the water tank when drilling at 0.00m (1 no.), 18.40m (1 no.) and 30.60m (1 no.) below existing ground level on 13/02/2012, 15/02/2012 and 17/02/2012 respectively.
3. Environmental monitoring well was installed at 30.00m below existing ground level on 18/02/2012 and groundwater sampling was carried out on 29/02/2012.



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH Offsite(a)**

CONTRACT No.: **GE/2010/01**

SHEET: **2** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-07**

E **827785.80**

DATE from: **10/02/2012** to **18/02/2012**

N **840973.13**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 26.37** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
		3.20m at 18:00	70	95	62	0	NI				16.37	10.00		III	Moderately weak, yellowish brown, moderately decomposed fine ash METATUFF.
11		4.50m at 08:00	70	25	0	0	NI				15.52	10.85		V	Joints are very closely spaced, rough planar to stepped, narrow to very narrow, iron oxide stained and kaolin (<1mm) coated, dipping at 5°-15° and 25°-35°.
12			70				NR				14.62	11.75		V	10.85 - 11.75m : No recovery, assumed to be completely decomposed fine ash METATUFF.
13			70												Extremely weak, brown (7.5YR/5/4) to purplish brown (7.5R/3/3), completely decomposed fine ash METATUFF. (Firm to stiff, clayey SILT)
14			70												
15			70												
16			70												
17			70												
18			70												
19		4.20m at 18:00	70												
19		4.80m at 08:00	70												
20			70												
20			70								6.77	19.60		V	

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
 DATE 28/02/2012
 CHECKED S.C. Wong
 DATE 29/02/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH Offsite(a)**

CONTRACT No.: **GE/2010/01**

SHEET: **3** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-07**

**E 827785.80
N 840973.13**

DATE from: **10/02/2012** to **18/02/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 26.37** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
21	70		70	80					35	20.50	6.37	20.00		V	METATUFF. (Stiff, slightly sandy, clayey SILT)
										20.70					
22	70		70	80					36	20.80					
										21.80					
23	70		70	100					37	21.50					
										21.90					
24	70	5.00m at 18:00 2.50m at 08:00	70	100					38	22.00					
										23.00					
25	70		70	100					39	23.10					
										23.10					
26	70		70	80					40	23.00				IV	Weak, brown to greyish brown, highly decomposed fine ash METATUFF. Recovered as silty angular medium to coarse gravel and cobbles.
										25.30					
27	70		70	90					41	24.10					
										24.20					
28	70		70	90	25	0	>20		42	24.20				III	Moderately weak, brown, moderately decomposed fine ash METATUFF.
										25.30					
29	70		70	70	0	0	NR		43	25.20				IV	Joints are very closely spaced, narrow, iron oxide stained and kaolin (<1mm) coated, dipping at 0°-10° and 20°.
										25.30					
30	70		70	80			NI		44	25.30				IV	27.70 - 27.82m : 8mm thick quartz vein. 28.00 - 28.10m : Weak, highly decomposed fine ash METATUFF.
										26.40					
									45	26.30					
									46	26.40					
									47	26.50					
									48	29.50					Weak, brown, mottled black, highly decomposed fine ash METATUFF. Recovered as slightly sandy, silty angular fine to coarse gravel and cobbles.

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang

DATE 28/02/2012

CHECKED S.C. Wong

DATE 29/02/2012

REMARKS



**FUGRO
GEOTECHNICAL
SERVICES LTD**

DRILLHOLE RECORD

HOLE No. **KTN-ASBH Offsite(a)**

CONTRACT No.: **GE/2010/01**

SHEET: **4** of **4**

PROJECT: **Agreement No. CE 61/2007 (CE) North East New Territories New Development Areas Planning and Engineering Study - Investigation**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No. **GE/2010/01.38**

MACHINE & No.: **FDR-07**

E **827785.80**
N **840973.13**

DATE from: **10/02/2012** to **18/02/2012**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL **+ 26.37** mPD

Drilling Progress	Casing depth/size	Water Level (m) Shift start/end	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
	HW 30.60	2.10m at 18:00							49		30.59	-4.23	30.60		IV	28.59 - 28.89m : No recovery, assumed to be completely decomposed fine ash METATUFF. Weak, brown, highly decomposed fine ash METATUFF. Recovered as angular cobbles. End of investigation hole at 30.60m.
31																
32																
33																
34																
35																
36																
37																
38																
39																
40													40.00			

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Televiwer Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED P. Zhang
DATE 28/02/2012
CHECKED S.C. Wong Or
DATE 29/02/2012

REMARKS