Pro	ject ID:	CES	050706	-BCC	Eastir	ng:	329843.4	86			1	
Pro	ject:	ESA			North	ing:	6243214.	480				NTIS TS
Clie	ent:	Boyd	Cooks	Cove	Eleva	tion:	2.05		26-32 Piri	ama Roa	ad Pyrmor	ver Level Suite 121 t 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A			Enviror	nmen	tal Lo	g:	A	BH274
DI	RILLING	INFO.		LITHOLOGY			SAMPL	ING IN	FORMA			
Depth	Method	Water	Symbol	Description		Sa	ample ID	Туре	0 250 JUJ	PID (p	750 b	WELL DETAIL
	Direct Push	×		FILL: Grass over silty sand tops brown, dry, fine grained with roo FILL: Crushed sandstone, orange/brown, course grained w clay and moist FILL: Sand, dark brown, fine to medium grained, loose and mois SAND: Sand, pale grey, fine to medium grained, loose, moist wi shells. Saturated from 1.4-2.5m CLAYEY SILT: Clayey silt, dark firm and wet SILTY CLAY: Silty clay, dark bro soft and moist EOH at 2.8mBGL (targeted de	brown,	13050	18-289-KW 18-290-KW 18-291-KW	Push Tube Push Tube				
5												
	ll Comp			Macquarie Drilling			Date Con				3/05/2	
	II Mode			Mac200			Date Con	-			3/05/2	
Hol	lole Diameter (mm): 50		50		Logged/checked by: K.Weir/L.Jenkins							
											Sł	neet: 1 of 1

Г

Pro	ject ID:	CES	050706	-BCC	Easting	: 329883	.398				
Pro	ject:	ESA			Northin	g: 624321	4.269			EAR SCIE	INTIS TS
Clie	ent:	Boyd	Cooks	Cove	Elevatio	on: 1.36		26-32 Piri	ama Roa	ad Pyrmor	wer Level Suite 121 ht 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Envir	onmen	tal Lo	g:	A	BH275
D	RILLING	INFO.		LITHOLOGY		SAM	PLING IN				
Depth	Method	Water	Symbol	Description		Sample ID	Туре	/DI7 550	PID (p 200	250 pm)	WELL DETAIL
0											
-	$\left \begin{array}{c} \\ \end{array} \right $			FILL: Grass over silty sand, brow fine grained, loose, moist with ro	vn, 1: oots	30508-285-KW	Push Tube				
				FILL: Sand, pale brown, fine to medium grained, loose, dry to m shells with orange mottles and ro	oist, pots						
-				FILL: Sand, yellow, fine to mediu grained, moderately turbid, dens	um ;e,						
- 1-				large shells and moist	1:	30508-288-KW	Push Tube				
-	usn			SAND: Sand, pale grey, fine to		30508-287-KW	Push				
-	Direct Push	¥		medium grained, shells and mois	st 🏴	30508-286-KW	Tube				
-	– Dir						Tube				
-	2										
2-				SILTY CLAY: Silty clay, dark gre very soft and wet	ey,						
				SILTY SAND: Silty clayey sand, grey, dense, moist, with shells at 2.8m	dark t 2.7-						
	~			EOH at 2.8mBGL (targeted de	epth)						
3-											
-											
-											
-											
4-											
-											
-											
-											
5											
Dri	ll Comp	oany:	Ν	Macquarie Drilling		Date Co	ommen	ced:	13	3/05/2	2008
	Prill Model: Mac200				Date Co			13	13/05/2008		
Но	lole Diameter (mm): 50		50		Logged	l/check	ed by:	K	.Weir	/L.Jenkins	
										neet: 1 of 1	

Pro	ject ID:	CES	050706	-BCC East	ing:	329929.3	95				
Pro	ject:	ESA		Norti	hing:	6243205.	442				ENTIS TS
Clie	ent:	Boyd	Cooks	Cove Eleva	ation:	1.81		26-32 Pi	rrama R	Road Pyrmo	wer Level Suite 121 nt 2009 : (02) 9552 4399
Loc	cation:	Cook	s Cove	- Area A		Enviror	nmen	tal Lo	og:	A	BH276
D	RILLING	INFO.		LITHOLOGY		SAMPL	ING IN				
Depth	Method	Water	Symbol	Description	Sar	mple ID	Туре	0 550 DIJ		220 (ppm)	WELL DETAIL
0	\land			FILL: Grass over silty sand, topsoil, dark brown, loose and dry with rootlets	130508	3-282-KW	Push Tube				
				FILL: Sand, brown, fine to medium grained, gravels and ash (black/grey/white), dry to moist and loose							
- 1- -				FILL: Sand, pale grey, fine grained, moderately dense, moist with shells	130508	3-283-KW	Push Tube				
-	Direct Push -	¥		FILL: Sand, orange, fine grained, dense and moist	130508	3-284-KW	Push Tube				
- - - - 2-	Dire			FILL: Sand, yellow, medium grained, moderately dense, moist and shells							-
-				SAND: Sand, pale grey, fine to medium grained and moderately dense							
-	\checkmark			SILTY SAND: Silty clayey sand, dark grey, soft and moist with organic odour							
- 3- - - - - - - - - - -				EOH at 2.8mBGL (targeted depth)							
- - 4											
5											
	Drill Company: Macquarie Drilling			Date Commenced: 13/05/2008					2008		
	Drill Model: Mac200				Date Con				13/05/	2008	
Но	ole Diameter (mm): 50					Logged/c	check	ed by:	.		r/L.Jenkins heet: 1 of 1

Pro	ject ID:	CES	050706	-BCC E	asting:	329968.7	74					
Pro	ject:	ESA		Ν	orthing:	6243234.	696	-	₹	1	AR	NTIS TS
Clie	ent:	Boyd	Cooks	Cove E	levation:	0.96		26-32	2 Pirram	a Road	Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Enviror	nmen	tal I	Log	•	Α	BH277
D	RILLING	INFO.		LITHOLOGY		SAMPL	ING IN					
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре	6 0		D (ppr 2003		WELL DETAIL
	Direct Push	¥		 FILL: Grass over silty sand topsoil, dark brown/black, fine grained, loos and moist with roots FILL: Sand, yellow, fine to medium grained, loose and moist with shells and rootlets FILL: Sand, yellow and pale grey w trace silt and large shells. Moist, medium grained and loose FILL: Sandy clayey silt, dark brown/black, strong H2S odour FILL: Silty sand, dark grey, moist w rootlets, shells and strong H2S odo FILL: Silty clayey sand, fine grained dark brown, soft and saturated with H2S odour 	se 13050 s 13050 rith 13050 rith 13050 rith rur)8-279-KW)8-278-KW)8-280-KW)8-281-KW	Push Tube Push Tube Push Tube					
				FILL: Silty clay, dark brown/grey, so and moist with large shells and H2S odour EOH at 2.8mBGL (targeted dept	5							
Dri	II Comp II Mode Ie Diam	l:	Γ	Macquarie Drilling Mac200 50		Date Con Date Con Logged/c	nplete	ed:		13/	05/2	2008 2008 /L.Jenkins
	Jain			~~				54 N	· · ·	1		neet: 1 of 1

Pro	ject ID:	CES	050706	-BCC Ea	asting:	330013.5	53				CON EAR	
Pro	ject:	ESA		Να	orthing:	6243235.	996	-	₹	5		INTIS TS
Clie	ent:	Boyd	Cooks	Cove El	evation:	0.89		26-32	Pirram	na Roa	d Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Enviror	nmen	tal L	₋og	1	A	BH278
D	RILLING	INFO.		LITHOLOGY		SAMPL	ING IN					
Depth	Method	Water	Symbol	Description	Sa	imple ID	Туре			1 D (pt	220 mc	WELL DETAIL
0												1
-	$\left \right $			FILL: Grass over silty sand topsoil, dark brown, soft, fine grained and moist	12050	8-276-KW	Push Tube	_				
-				FILL: Sand, yellow grading to pale brown, fine to medium grained, moderately dense and moist								
				FILL: Silty sand with trace clay, dark grey. Mostly shells		8-277-KW	Push	•				
1				FILL: Silty sand, grey, fine to mediur grained, moderately dense and mois with shells	m st		Tube					
-	Direct Push	¥		FILL: Sand, pale grey, medium grained, moist to wet with large shell	ls							
-	Di			FILL: Clayey silt, dark brown, soft an moist to wet	nd							
				FILL: Sand, pale grey, medium grained, wet with shells								
2				FILL: Clayey silt, dark brown/black a wet	and							
				SILTY SAND: Silty sand with trace clay, dark grey, wet with slight H2S odour								
-	\checkmark			EOH at 2.8mBGL (targeted depth	ı)							
3-												
-												
-												
-												
4												
-												
-												
-												
5												
Dri	ll Comp	any:	ſ	Macquarie Drilling		Date Con	nmen	ced:		13	3/05/2	2008
	II Mode	-		Mac200		Date Con				13	3/05/2	2008
Но	lole Diameter (mm): 50		50		Logged/c	check	ed b	y:	K.	Weir	/L.Jenkins	
											Sł	neet: 1 of 1

Pro	ject ID:	CES	050706	-BCC East	ing:	329709.6	653			CON	
Pro	ject:	ESA		Nort	hing:	6243160	.286	-		SCIE	EN TIS TS
Clie	ent:	Boyd	Cooks	Cove Elev	ation:	2.58		26-32 P	rrama F	Road Pyrmo	wer Level Suite 121 nt 2009 : (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Enviro	nmen	tal Lo	og:	A	BH279
DI	RILLING	INFO.		LITHOLOGY		SAMPL	ING IN				
Depth	Method	Water	Symbol	Description	S	ample ID	Туре	FIC 0		750 mdd)	WELL DETAIL
0				FILL: Grass over sandy topsoil, dark brown, loose, dry with roots FILL: Sand, dark brown, fine grained,	13050)8-319-KW	Push Tube				
				dry with gravels and clay FILL: Sand and silt layers, brown, grey	13050	08-320-KW	Push				
1 - - -	ct Push	¥		with shells			Tube				
- - - - 2- - - - - -	Direct Push			SAND: Sand, pale grey, medium grained, wet, dense with trace silt and shells	13050)8-321-KW	Push Tube	_			
-			······ ·····	SAND: Sand, grey, medium grained and wet CLAYEY SILT: Clayey silt, dark grey,							
3- 3- - - - - - - - - - - - - - - - - -				firm and moist. EOH at 2.8mBGL (targeted depth)							
5 Dri	II Cam-	2014	N	Macquarie Drilling		Date Cor	nmer	ood.		13/05/2	2008
	II Comp II Mode	-		Macquarie Drining Mac200		Date Cor				13/05/	
	le Diam					Logged/	-			K.Weii	r/L.Jenkins heet: 1 of 1

Pro	ject ID:	CES	050706	-BCC Ea	asting:	329745.0	44			•	
Pro	ject:	ESA		No	orthing:	6243167.	894	4			NTIS TS
Clie	ent:	Boyd	Cooks	Cove El	levation:	2.87		26-32 Piri	ama Ro	ad Pyrmor	ver Level Suite 121 nt 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	e - Area A		Enviror	nmen	tal Lo	g:	A	BH280
D	RILLING	INFO.		LITHOLOGY		SAMPL	ING IN				
Depth	Method	Water	Symbol	Description	Sa	mple ID	Туре	/DI7 550	PID (p	250 pm)	WELL DETAIL
0 	\land			FILL: Grass over sandy topsoil, brov fine to medium grained, dry and loos	wn, 13050 se	8-299-KW	Push Tube	-			
-				FILL: Sand, brown, fine to medium grained, dry to moist and loose							
-				FILL: Clay, brown/grey/orange mottl gravels and very stiff	les, 13050	8-300-KW	Push Tube				
- 1- -				FILL: Sand, pale grey, fine to mediu grained, dry and loose with shells	m						
-	Direct Push -	▼		FILL: Crushed sandstone, white/pinl dry and hard	k,						
-	Direc			UNKNOWN: Core loss							
2				SAND: Sand, pale grey, fine to medium grained, loose, moist with shells	to 13050	8-301-KW	Push	•			
-	\downarrow			EOH at 2.8mBGL (targeted depth	ı)	/	Tube				
3- - - - - - - - - - - - - - - - - - -											
5											
	II Comp	-		Macquarie Drilling		Date Con				3/05/2 2/05/2	
	ll Mode le Diam			Mac200		Date Con Logged/c	-			3/05/2 Woir	2008 /L.Jenkins
		erei (u				ւսցցես/ն	ILECK(eu by:	r		heet: 1 of 1
										0	

Pro	ject ID:	CES	050706	-BCC East	ing:	329789.4	18				
Pro	ject:	ESA		Nort	hing:	6243190	.974	-	₹	- sc	IRTH IENTISTS
Clie	nt:	Boyd	Cooks	Cove Eleva	ation:	1.85		26-32	Pirrama	a Road Pyr	Lower Level Suite 121 mont 2009 AX: (02) 9552 4399
Loc	ation:	Cook	s Cove	e - Area A	_	Enviro	nmen	tal I	_og:	1	ABH281
DF	RILLING	INFO.		LITHOLOGY	_	SAMPL	ING IN				WELL DETAIL
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре	•		2 (ppm) 2 (200 000	
				FILL: Grass over unknown due to core loss FILL: Sand, yellow, fine to medium grained, loose, moist with shells. Silt lenses at 0.9m	13050	08-302-KW	Push Tube				
- - - - - - - - - - - - - - - - - - -	Direct Push —	¥		FILL: Silty sand, fine to medium grained, loos and moist to wet. Grading through brown/grey/yellow and grey. Wet from 1.4m	13050	08-303-KW	Push Tube				
	V			FILL: Silty sand, dark grey, fine to medium grained, wet, moderately dense with shells and trace clay FILL: Sandy clayey silt, black, moderately dense and wet FILL: Silty clay, dark brown/grey, soft and moist							
3 				FILL: Silty clayey sand, fine grained, dark brown, dense and moist. EOH at 2.8mBGL (targeted depth)							
5 [∟] Dril	Drill Company: Macquarie Drilling			Date Cor	nmen	ced:	<u> </u>	13/0	5/2008		
	Drill Model: Mac200					Date Cor	-				5/2008
Hol	Hole Diameter (mm)		nm): 5	50		Logged/o	check	ed b	y :		eir/L.Jenkins Sheet: 1 of 1

Pro	ject ID:	CES	050706	-BCC	Easting: 329825.352 Northing: 6243184.501						
Pro	ject:	ESA			Northing:	6243184.	501	-7		SCIE	NTIS TS
Clie	ent:	Boyd	Cooks	Cove	Elevation:	1.35		26-32 Pirra	ama Roa	ad Pyrmor	ver Level Suite 121 at 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Enviror	nment	al Log	g:	Α	BH282
D	RILLING	INFO.		LITHOLOGY		SAMPL	ING INF				
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре	FIDI7 520	9) DI 200	250 bm)	WELL DETAIL
0											
-	\uparrow			FILL: Grass over silty sand topso dark brown, moist with rootlets	il, 13050)8-296-KW	Push Tube				
-				FILL: Sand, pale brown, fine to medium grained, loose and moist shells	t with						
-				FILL: Sand, yellow, fine to mediu grained, loose and moist with she	m ells						
1-				FILL: Sand, dark grey, fine to me grained, loose and moist with she							
-	- usuc			FILL: Sand, pale grey, with dark brown, fine to course grained, moderately dense and moist with	silt						
-	Direct Push	¥		lenses, orange mottles and shells	s)8-297-KW	Push Tube				
-				SAND: Sand, pale grey, medium grained, moderately dense and w 1.5m	vet at						
2-											
-											
				SAND: Shell layer							
-				SILTY SAND: Silty clayey sand, g moist and soft)8-298-KW	Push Tube				
	*			EOH at 2.8mBGL (targeted de	pth)		Tube				
3-											
-											
-											
-											
4											
-											
-											
-											
5											
Dri	Drill Company: Macquarie Drilling			Date Con	nmenc	ed:	1	3/05/2	2008		
	rill Model: Mac200				Date Con			1	13/05/2008		
Но	ole Diameter (mm): 50				-		K	.Weir	/L.Jenkins		
					Logged/checked by: K.Weir/L.Jenkins Sheet: 1 of					neet: 1 of 1	

Project ID:	CES	050706	-BCC	Easting:	329888.7	702						
Project:	ESA			Northing	: 6243165	.119				IN TIS TS		
Client:	Boyd	Cooks	Cove	Elevatior	1 : 1.59		26-32 Pir	rama Ro	ad Pyrmor	ver Level Suite 121 nt 2009 (02) 9552 4399		
Location:	Cook	s Cove	e - Area A		Enviro	nmen	tal Lo	g:	Α	BH283		
DRILLING I	NFO.		LITHOLOGY		SAMPL	ING IN	FORMA					
Depth Method	Water	Symbol	Description		Sample ID	Туре	0 250 JII	1) DIP	220 pm)	WELL DETAIL		
			FILL: Grass over silty clayey sand topsoil, dark brown, firm, dry to m with roots and charcoal FILL: Sand, pale brown, fine grain	noist	0508-381-KW	Push Tube						
- Direct Push	¥		FILL: Sand, pale blown, fine gran loose and dry to moist FILL: Sand, pale yellow, grading grey, fine to medium grained, loos and moist. Wet at 1.5m	to	0508-382-KW	Push Tube						
2			SAND: Sand, pale grey, medium grained, moderately dense and w with shells SILTY CLAY: Silty clay, dark brow firm and wet	vet 150	0508-383-KW	Push Tube						
3-			SILTY SAND: Silty sand, grey, medium grained and wet SILTY CLAY: Silty clay, dark grey and wet. EOH at 2.8mBGL (targe depth)	y, firm eted								
- - - - - - - - - - - - - - - - - - -												
5									E /0 E /			
Drill Comp	-		Macquarie Drilling		Date Cor				5/05/2			
Drill Model Hole Diame		Mac200 er (mm): 50			Date Completed: Logged/checked by					15/05/2008 K.Weir/L.Jenkins Sheet: 1 of 1		

Project IE	: CES	050706-BCC	Easting:	329927.2	.12			
Project:	ESA		Northing:	6243176.		₹		NTIS TS
Client:	Boyd	Cooks Cove	Elevation:	1.76	26-	32 Pirrama	a Road Pyrmor	ver Level Suite 121 t 2009 (02) 9552 4399
Location	Cool	ks Cove - Area A		Enviror	nmental	Log:	Α	BH284
DRILLIN	G INFO.	LITHOLOGY		SAMPL	ING INFOR			WELL DETAIL
Depth Metho	d Water	Symbol Description	S	ample ID	Type _o		200 (ppm)	
0 	•	FILL: Grass over silty top brown, firm, dry with roots FILL: Sand, yellow, fine g and dry FILL: Silty clay, dark brow dry FILL: Sand, yellow, fine to grained, orange mottles,s from 1.4m SAND: Sand, grey, media moderately dense and we show, soft and wet with show of the soft and s	s rrained, loose vn, firm and p medium shells and wet 15050 um grained, et 15050 y sand, dark shells	08-384-KW 08-387-KW 08-386-KW 08-385-KW 08-385-KW	Push Tube Push Tube Push Tube Push Tube			
		EOH at 2.8mBGL (targ	eted depth)					
Drill Com	panv:	Macquarie Drilling		Date Con	nmenced	d:	15/05/2	2008
Drill Mod		Mac200		Date Con			15/05/2	2008
Hole Dia	neter (r	mm): 50		Logged/c	checked	by:	K.Weir	/L.Jenkins
							Sł	neet: 1 of 1

Pro	ject ID:	CES	050706	-BCC	Eastin	ng:	329971.6	24			CON		
Pro	ject:	ESA			North	ing:	6243183.	325	-		[/] scii	EN TIS TS	
Clie	ent:	Boyd	Cooks	Cove	Elevat	tion:	1.74		26-32 Pi	rrama F	load Pyrmo	ower Level Suite 121 ont 2009 : (02) 9552 4399	
Loc	ation:	Cook	s Cove	- Area A			Enviror	nmen	tal Lo	g:	ł	ABH285	
D	RILLING	INFO.		LITHOLOGY			SAMPL	ING INI					
Depth	Method	Water	Symbol	Description		Sa	mple ID	Туре	0 250 DIJ		220 ppm)	WELL DETAIL	
0												1	
-	\uparrow			FILL: Bark over silty sand topsoi brown, dry, loose with roots	il, dark	15050	8-389-KW	Push Tube					
-				FILL: Silty clay, dark brown, firm dry	and								
- - - 1- -				FILL: Sand, pale grey with orang mottles and shells, fine to mediu grained, loose to dense and moi Wet at 1.4m	ım	15050	8-390-KW	Push Tube	•				
	Direct Push	¥											
- 2- - - - -				SILTY SAND: Silty clayey sand, grained, dark brown and wet SILTY SAND: Silty sand, dark gr									
-	\checkmark			with trace clay and wet	loy								
3- 3- - - - - - - - - - - - - - - - - -				EOH at 2.8mBGL (targeted de	epth)								
5													
Drill Company: Macquarie Drilling						Date Commenced: 15/05/2008				2008			
	II Mode		ľ	Mac200			Date Con	nplete	ed:	15/05/2008			
Ho	ole Diameter (mm): 50			50		Logged/checked by: K.Weir/L.Jenkin					r/L.Jenkins heet: 1 of 1		

Pro	ject ID:	CES	050706	-BCC E	asting:	330001.4	17		1			
Pro	ject:	ESA		Ν	lorthing:	6243192.	728		₹	1	EAR SCIE	NTIS TS
Clie	ent:	Boyd	Cooks	Cove E	levation:	1.44		26-32	Pirram	a Road	Pyrmor	ver Level Suite 121 t 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Enviro	nmen	tal L	_og:		Α	BH286
D	RILLING	INFO.		LITHOLOGY		SAMPL	ING IN					
Depth	Method	Water	Symbol	Description	s	ample ID	Туре	• F	10/PII		n) 06/	WELL DETAIL
0	•											
-				FILL: Grass on silty sand topsoil wi trace clay, dark brown, moist, roots and gravels		08-391-KW	Push Tube					
- - - - - - - -				FILL: Sand, yellow, fine to medium grained, dry, loose, shells and oran mottles. Ash at 0.3m	nge	08-392-KW	Push Tube	•				
	Direct Push –	¥		FILL: Sand, grey, fine to medium grained, moiost, shells, loose with orange mottles and wet at 1.3m								
2	~			FILL: Silty clayey sand, dark brown wet and soft SILTY SAND: Silty sand, grey, fine medium grained, moderatley dense wet with rootlets SILTY SAND: Silty clayey sand, da grey, soft, moist to wet with shells.	to e, 1505	08-394-KW 08-393-KW	Push Tube Push Tube					
3- 3- - - - - - - - - - - - - - - - - -				EOH at 2.8mBGL (targeted depth)								
Dri	ll Comp	anv:	ľ	Macquarie Drilling		Date Con	nmen	ced:		15/	/05/2	2008
	ll Mode	-		Mac200		Date Con						2008
Ho	le Diam	eter (n	nm): 5	50		Logged/d	check	ed b	y :	K.\		/L.Jenkins neet: 1 of 1

Project ID:	CES	050706-	BCC	Easting:	329802.3	45				
Project:	ESA			Northing:	6243164.	287	-		SCIE	INTIS TS
Client:	Boyd	Cooks	Cove	Elevation	: 1.88		26-32 Pi	rrama Ro	oad Pyrmor	wer Level Suite 121 ht 2009 (02) 9552 4399
Location:	Cook	s Cove	- Area A		Enviror	nmen	tal Lo	og:	A	BH287
DRILLING I	NFO.		LITHOLOGY		SAMPL	ING IN				
Depth Method	Water	Symbol	Description		Sample ID	Туре	0 550 DIJ	/PID ()	090) 220	WELL DETAIL
0 	×		FILL: Grass over silty topsoil, bro fine grained, dry, loose with rooth FILL: Sand, pale grey, silt lenses orange mottles, shells, fine to me grained, moist at depth and wet to 1.3m SILTY SAND: Silty sand, dark gr firm, fine to medium grained, we shells and silt lenses SILTY SAND: Silty clay, dark bro and moist EOH at 2.8mBGL (targeted de	lets s and edium from 1509 rey, t with pown	508-379-KW	Push Tube Push Tube				
⁵ Drill Comp Drill Model Hole Diam	:	N	1acquarie Drilling 1ac200 0		Date Con Date Con Logged/c	nplete	ed:	1		

Pro	ject ID:	CES	050706	-BCC Eas	ting:	329838.1	39					
Pro	ject:	ESA		Nor	thing:	6243142	.892	Ξ	₹		EAR SCIE	INTIS TS
Clie	ent:	Boyd	Cooks	Cove Elev	vation:	1.53		26-3	2 Pirra	ma Roa	ad Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	e - Area A		Enviro	nmen	tal	Log	j:	A	BH288
D	RILLING	INFO.		LITHOLOGY		SAMPL	ING IN					
Depth	Method	Water	Symbol	Description	s	ample ID	Туре	0	FID/P 520	1 D (p) 200	250 pm)	WELL DETAIL
0 - - - - - - - - - - - - - - - - -	Direct Push	×		FILL: Grass over silty sand topsoil, dark brown, fine grained, moist and rootlets FILL: Sand, pale grey, fine to medium grained, loose and moist with shells FILL: Silty clay, brown/grey mottled, firm and dry to moist FILL: Sand, pale grey with orange mottles, fine to medium grained, moist and dense with shells FILL: Sand, orange, medium grained, wet and loose SILTY SAND: Silty sand, medium grained, wet with shells		08-373-KW 08-374-KW	Push Tube					
	<u> </u>			SILTY CLAY: Silty clay, dark brown, soft and moist EOH at 2.8mBGL (targeted depth)	1505	08-375-KW	Push Tube	•				
4												
											E /0 F /	2008
	II Comp II Mode	-		Macquarie Drilling Mac200		Date Cor			:		5/05/2 5/05/2	
	le Diam					Date Cor Logged/	-		.vc			2008 /L.Jenkins
	.e Biain							K	· , ·	IX.		neet: 1 of 1
1												

Pro	ject ID:	CES	050706	-BCC Eas	ting:	329888.0	68					
Pro	ject:	ESA		Nor	thing:	6243145.	122	5	₹		EAR SCIE	INTIS TS
Clie	ent:	Boyd	Cooks	Cove Elev	vation:	1.88		26-32	2 Pirrar	na Road	l Pyrmor	ver Level Suite 121 nt 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	e - Area A		Enviror	nmen	tal I	Log	:	A	BH289
D	RILLING	INFO.		LITHOLOGY		SAMPL	ING IN					
Depth	Method	Water	Symbol	Description	S	ample ID	Туре	F	520 D/D	D (pp	750 m	WELL DETAIL
	Direct Push	¥		FILL: Grass over silty clay topsoil, dark brown, moist with rootlets FILL: Sand, pale grey/orange mottles, fine to medioum grained, moderately dense, moist with shells. Wet at 1.4m SANDY CLAY: Sandy silty clay, dark brown, firm and moist SILTY SAND: Silty clayey sand, dark brown, firm and moist with shells and roots EOH at 2.8mBGL (targeted depth)	15050	D8-371-KW	Push Tube Push Tube					
Dri	ll Comp	any:	Γ	Macquarie Drilling		Date Con	nmen	ced:	1	15	6/05/2	2008
	ll Mode		ſ	Mac200		Date Con	nplete	ed:		15	/05/2	2008
Ho	le Diam	eter (n	nm):	50		Logged/o	check	ed b	y:	K.		/L.Jenkins
											Sł	neet: 1 of 1

Pro	ject ID:	CES	050706	-BCC	Eastin	ng:	329924.7	'15					
Pro	oject:	ESA			North	ing:	6243131	.849	4	₹		EAR SCIE	INTIS TS
Clie	ent:	Boyd	Cooks	Cove	Elevat	tion:	1.87		26-32	2 Pirra	ma Roa	ad Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Loc	cation:	Cook	ks Cove	e - Area A			Enviro	nmen	tal	Log	J:	A	BH290
D	RILLING	INFO.		LITHOLOGY			SAMPL	ING IN					
Depth	n Method	Water	Symbol	Description		Sa	mple ID	Туре	0	FID/P 520	ID (p)	220 pm)	WELL DETAIL
0	I			Γ									1
-	\uparrow			FILL: Grass over silty sand, tops dark brown, firm with trace clay	oil,	15050	8-358-KW	Push Tube					
				FILL: Crushed sandstone, course grained, orange and dry	e								
-				FILL: Silty sand, dark brown, fine grained and dry	e								
				FILL: Silty clay, dark brown, firm dry	and								
1	len hau			FILL: Sand, pale, grey, fine to me grained, dry and dense with shel orange mottles	edium lls and								
-	Direct Push	¥		FILL: Silty clay, dark brown, firm dry	and	15050	8-359-KW	Push Tube					
				FILL: Sand, pale grey, medium grained, orange mottles, moist w shells	/ith								
2				SAND: Sand, pale grey, fine to medium grained, dense and wet shells	with								
	\checkmark			SILTY CLAY: Silty clay, dark bro soft and moist	wn,								
				EOH at 2.8mBGL (targeted de	epth)								
3													
4-													
-													
-													
5													
	Image: state of the state												
	ill Mode	-		Mac200			Date Cor			-		5/05/2	
Но	le Diam	eter (n	nm):	50			Logged/	-		by:	K	.Weir	/L.Jenkins
												SI	heet: 1 of 1

Project: ESA Northing: 6243136.660 Section 12.52 Description 2.52 Location: Cooks Cove Elevation: 2.52 Description 2.52 Mathematication 2.52 Depth LithoLogy SAMPLING INFO. LithoLogy ABH291 Depth Mathematication: Sample ID Type ABH291 Opph Method Value Symbol Description Sample ID Type Rest Log Table James 0 It.: Consequencial cost Sample ID Type Rest Log Table James Method Value Method Value Sample ID Type Rest Log Table James 0 It.: Consequencial cost It.: Consequencial cost Ites Cost Sample ID Type Rest Log Table James 1 It.: Consequencial cost Ites Cost Sample James Type Rest Log Table James Rest Log Table James 2 Ites Cost Sample James Type Rest Log Table James Rest Log Table James 1 Ites Cost Rest Log Table James Ites Cost Rest Log Table James Rest Log Table James 2 Ites Cost Ites Cost Res	Pro	ject ID:	CES	050706-BCC	Easting:	329972.0	55		
Client: Boyd Cooks Cove Elevation: 2.52 Prove the state fragment of the state o	Pro	ject:	ESA		Northing	: 6243136.		sc 🗸	IENTIS TS
DRILLING INFO. LITHOLOGY SAMPLING INFO. Depth Method Water Symbol Description Sample ID Type EXPENDIO (ppm) Depth Method Water Symbol Description Sample ID Type EXPENDIO (ppm) 0 FILL Stand, pale thrown, fine and through instant brown, fine and model in substrate graves, dry to most with same brown, fine and most with shells 150008-353-KW Pale in the integration of the same brown, fine and most with shells 2 Fill Sin day, dark brown, fine and most with shells 150008-357-KW Pale in the integration of the shells 3 Fill Sin day, dark brown, fine and most with shells 150008-357-KW Pale in the integration of the shells 3 Fill Sin day, dark brown, fine and most with shells 150008-357-KW Pale in the integration of the shells 4 Fill Sin day, dark brown, fine and most to wet method wet 150008-357-KW Pale in the integration of the shells 5 Fill Sin day, dark brown, fine and most to wet 150008-357-KW Pale in the integration of the shells 5 EON at 4.2mBOL (targeted depth) 150008-357-KW Pale in the integration of the shells	Clie	ent:	Boyd	Cooks Cove	Elevation	n: 2.52	26-32	Pirrama Road Pyr	mont 2009
Depth Method Water Symbol Description Sample ID Type PIOPID (ppm) 0	Loc	ation:	Cook	s Cove - Area A		Enviror	nmental L	_og:	ABH291
Depth Method Water Symbol Description Sample ID Type Iteration 0 FILL: Grass over sity sand topool. If the bown, firm and molis FILL: Sand, pale brown, firm and molis 150508-354-KW Puth FILL: Sand, pale brown, firm and molis 1 If FILL: Sand, pale brown, firm and molis FILL: Sand, pale gray, first to modulu graned, notes and sand brown, solt and moli with shells 150508-355-KW Puth FILL: Sand, pale gray, first to modulu graned, dense and wet with shells 2 FILL: Sand, pale gray, first to modulu graned, dense and wet with shells 150508-355-KW Puth FILL: Sand, pale gray, medium graned, dense and wet with shells 3 FILL: Sand, pale gray, medium graned, dense and wet with shells 150508-355-KW Puth FILE: Sand, pale gray, medium graned, dense and wet with shells 4 FILL: Ash waste, black/white, loose in the grained and most to wet. 150508-355-KW Puth FILE: Sand, sand wet trace clay, brown, fire grained and most to wet. 150508-357-KW Puth FILE: Sand, gray and dark 4 EOH at 4.2mBGL (argeted depth) 150508-357-KW Puth FILE: Sand, gray and dark 150508-357-KW Puth FILE: Sand, gray and dark 5 EOH at 4.2mBGL (argeted depth) 150508-357-KW Puth FILE: Sand, gray and dark 150507-2008 5 EOH at 4.2mBGL (argeted depth) 150507-2008 15/05/2008 Drill Company: Mac200 <td< th=""><th>DI</th><th>RILLING</th><th>INFO.</th><th>LITHOL</th><th>DGY</th><th>SAMPL</th><th></th><th>ATION</th><th></th></td<>	DI	RILLING	INFO.	LITHOL	DGY	SAMPL		ATION	
Image: SAND: Sand with trace clay, brown, firm and moist 150508-354-KW Pash in the sand structure is the sand structure in the sand structure in the sand structure is the sand structure in the sand structure is the sand struc	Depth	Method	Water	Symbol Descri	otion	Sample ID			WELL DETAIL
1 4 4 FILL: Sind, paid brown, firm in dire is to the is to t	0								
1 FILL: Said, pale brown, fire to medium grained, lose to dense, dry to most with sandstone gravels 110600-352-KW Puth 1 FILL: Sity daysy sand, brown, soft and noist with shalls 150608-352-KW Puth 2 FILL: Sity daysy sand, brown, firm and moist with shalls 150608-352-KW Puth 2 FILL: Sity daysy sand, brown, firm and moist with shalls 150608-352-KW Puth 3 FILL: Sity daysy sand, brown, firm and moist with shalls 150508-356-KW Puth 3 FILL: Sity daysy sand, dark brown, firm and moist 150508-356-KW Puth 3 FILL: Sity daysy sand, dark brown, firm and moist 150508-356-KW Puth 3 FILL: Sity daysy sand, dark 150508-356-KW Puth 3 FILL: Sity daysy sand, dark 150508-357-KW Puth 3 FILL: Sity daysy sand, dark 150508-357-KW Puth 3 FILL: Sity daysy sand, dark 150508-357-KW Puth 4 SAND: Sand with trace day, brown, fire grained and noist to wet 150508-357-KW Puth 5 FILL: Soft days days 150508-357-KW Puth 1505/2008 6 Toth at 4.2mBGL (targeted depth) Ta	-	\uparrow)508-354-KW			
1 1 10508-353-KW 1200 1 110508-352-KW 1200 1200 1 10508-352-KW 1200 1200 1 10508-352-KW 1200 1200 1 10508-352-KW 1200 1200 1 10508-352-KW 1200 1200 1 10508-355-KW 1200 1200 1 10508-356-KW 1200 1200 1 10508-356-KW 1200 1200 1 10508-357-KW				medium grained, l	bose to dense, dry				
1 Image: Stand pail gray, file to medium grained, moist and loss 150508-355-KW Puth grained, moist and loss 2 Image: Stand, pail gray, file to medium grained, dank moist and loss 150508-355-KW Puth grained, dank brown, film and moist in the lis 3 Image: Fill)508-353-KW			
2 4 FILL: Salt, pale grey, fine to medium grained, moist with shells 150508-355-KW Push Tube 2 6 000 FILL: Salt, pale grey, fine to medium grained, dense and wet with shells 150508-355-KW Push Tube 3 FILL: Salt, pale grey, medium grained, dense and wet with shells 150508-356-KW Push Tube 1 3 FILL: Sand, pale grey, medium grained, dense and wet with shells 150508-356-KW Push Tube 1 3 FILL: Sand, pale grey, medium grained, dense and wet with shells 150508-356-KW Push Tube 1 4 FILL: Sand, pale grey, medium grained, dense and wet with shells 150508-356-KW Push Tube 1 5 SanD: Sand with trace clay, brown, firm and moist to wet 150508-357-KW Push Tube 1 5 SanD: Sand with trace clay, brown, firm and moist to wet 150508-357-KW Push Tube 1 5 SanD: Sand with trace clay, brown, firm and moist to wet 150508-357-KW Push Tube 1 5 SanD: Sand with trace clay, brown, firm and moist to wet 150508-357-KW Push Tube 1 5 SanD: Sand with trace clay, brown, firm and moist to wet 150508-357-KW Push Tube 1					150	0508-352-KW			
Image: second	1-								
2 g g FILL: Sand, pale grey, fine to medium grained, moist and loose 150508-355-KW Push moist and loose 2 g g FILL: Slit clay, dark brown, firm and moist FILL: Slit clay, dark brown, firm and moist 3 FILL: Slit clay, dark brown, firm and wet FILL: Slit clay, dark brown, firm and moist and wet with shells 3 FILL: Sand, pale grey, medium grained, dense and wet with shells 150508-356-KW Push moist 4 FILL: Sand, pale grey, medium grained, dense and wet with shells 150508-356-KW Push moist 3 FILL: Sand, pale grey, medium grained, dense and wet with shells 150508-356-KW Push moist 4 FILL: Sand, pale grey, medium grained, dense and wet 150508-356-KW Push moist 4 SAND: Sand with trace clay, brown, fire grained and moist to wet 150508-357-KW Push moist 5 EOH at 4.2mBGL (targeted depth) 150508-357-KW Push moist 1 5 FILL: Sand, pale grey, firet grained and moist to wet 150508-357-KW Push moist 1 5 FILL: Ash wate, black/white, loose 150508-357-KW Push moist 1 1 5 FILL: Ash wate, black/white, loose 1 1									
2 grained, moist and loose 2 Gray 3 FILL: Slit clay, dark brown, firm and moist 3 FILL: Slit clay, dark brown, firm and moist 3 FILL: Slit clay, dark brown, firm and moist 3 FILL: Ach waste, black/while, loose and wet with shells 4 FILL: Ach waste, black/while, loose and wet with shells 5 SAND: Sand with trace clay, brown, fire grained and moist to wet 5 EOH at 4.2mBGL (targeted depth) 5 Drill Company: Macquarie Drilling Drill Company: Macquarie Drilling Date Commenced: 15/05/2008 Hole Diameter (mm): 50 Logged/checked by: K.Weir/L.Jenkins					150)508-355-KW			
2 5 3 FILL: Sand, pale grey, medium grained, dense and wet with shells 4 FILL: Ash waste, black/white, loose and wet with shells 3 FILL: Ash waste, black/white, loose and wet with shells 3 SILTY SAND: Silty clayey sand, dark grey, soft and wet 5 SAND: Sand with trace clay, brown, fine grained and moist to wet 5 EOH at 4.2mBGL (targeted depth) 5 Drill Company: Macquarie Drilling Drill Model: Mac200 Date Commenced: 15/05/2008 Hole Diameter (mm): 50 Logged/checked by: K.Weir/L.Jenkins				grained, moist and	loose				
2 5 3 FILL: Sand, pale grey, medium grained, dense and wet with shells 4 FILL: Ash waste, black/white, loose and wet with shells 3 FILL: Ash waste, black/white, loose and wet with shells 3 SILTY SAND: Silty clayey sand, dark grey, soft and wet 5 SAND: Sand with trace clay, brown, fine grained and moist to wet 5 EOH at 4.2mBGL (targeted depth) 5 Drill Company: Macquarie Drilling Drill Model: Mac200 Date Commenced: 15/05/2008 Hole Diameter (mm): 50 Logged/checked by: K.Weir/L.Jenkins				FILL: Silt clay, dar	k brown, firm and				
Image: state of the state is the state	2-	hsh	¥						
Image: state of the state is the state		rect F		FILL: Sand, pale g grained, dense an	rey, medium d wet with shells				
and wet 150508-356-KW Push Tube J SILTY SAND: Sitty clayey sand, dark grey, soft and wet 150508-356-KW Push Tube J SAND: Sand with trace clay, brown, fine grained and moist to wet 150508-357-KW Push Tube J EOH at 4.2mBGL (targeted depth) 150508-357-KW Push Tube J EOH at 4.2mBGL (targeted depth) 150508-357-KW Push Tube J EOH at 4.2mBGL (targeted depth) 150508-357-KW Push Tube 150508-357-KW Drill Company: Macquarie Drilling Date Commenced: 15/05/2008 Drill Model: Mac200 Date Completed: 15/05/2008 Hole Diameter (mm): 50 Logged/checked by: K.Weir/L.Jenkins	-	Di							
and wet 150508-356-KW Push Tube J SILTY SAND: Sitty clayey sand, dark grey, soft and wet 150508-356-KW Push Tube J SAND: Sand with trace clay, brown, fine grained and moist to wet 150508-357-KW Push Tube J EOH at 4.2mBGL (targeted depth) 150508-357-KW Push Tube J EOH at 4.2mBGL (targeted depth) 150508-357-KW Push Tube J EOH at 4.2mBGL (targeted depth) 150508-357-KW Push Tube 150508-357-KW Drill Company: Macquarie Drilling Date Commenced: 15/05/2008 Drill Model: Mac200 Date Completed: 15/05/2008 Hole Diameter (mm): 50 Logged/checked by: K.Weir/L.Jenkins									
3 Image: Single Silty SaND: Silty clayey sand, dark grey, soft and wet 4 Image: Single Silty clayey sand, dark grey, soft and wet 4 Image: Single Silty clayey sand, dark grey, soft and wet 5 SAND: Sand with trace clay, brown, fine grained and moist to wet 1 Image: Single Silty clayey sand, dark grey, soft and wet 5 EOH at 4.2mBGL (targeted depth) 5 Image: Single Silty clayey sand, dark grey, soft and wet 5 Image: Single Silty clayey sand, dark grey, soft and wet 5 Image: Single Silty clayey sand, dark grey, soft and wet 5 Image: Single Silty clayey sand, dark grey, soft and wet 5 Image: Single Silty clayey sand, dark grey, soft and wet 5 Image: Single Silty clayey sand, dark grey, soft and wet 5 Image: Single Silty clayey sand, dark grey, soft and wet 5 Image: Single Silty clayey sand, dark grey, soft and wet 5 Image: Single Silty clayey sand, dark grey, soft and wet 5 Image: Single Silty clayey sand, dark grey, soft and wet 5 Image: Single Silty clayey sand, dark grey, soft and wet 5 Image: Single Silty clayey sand, dark grey, soft and wet 5 Image: Single Silty clayey sand, dark grey, soft and wet <td></td> <td></td> <td></td> <td>And wet</td> <td></td> <td>)508-356-KW</td> <td>Push</td> <td></td> <td></td>				And wet)508-356-KW	Push		
A SAND: Sand with trace clay, brown, fine grained and moist to wet BOH at 4.2mBGL (targeted depth) 5 Drill Company: Macquarie Drilling Drill Model: Mac200 Hole Diameter (mm): 50 Logged/checked by: K.Weir/L.Jenkins	2					/	Tube		
SAND. Sand with face day, blown, fine grained and moist to wet 150508-357-KW Push Tube Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second con									
SAND. Sand with face day, blown, fine grained and moist to wet 150508-357-KW Push Tube Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second con									
SAND. Sand with face day, blown, fine grained and moist to wet 150508-357-KW Push Tube Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second con									
SAND. Sand with face day, blown, fine grained and moist to wet 150508-357-KW Push Tube Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second con									
SAND. Sand with face day, blown, fine grained and moist to wet 150508-357-KW Push Tube Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second and moist to wet Image: second control of the second con									
Image: Solution of the second seco				SAND: Sand with	trace clay, brown, loist to wet)508-357-KW			
Drill Company:Macquarie DrillingDate Commenced:15/05/2008Drill Model:Mac200Date Completed:15/05/2008Hole Diameter (mm):50Logged/checked by:K.Weir/L.Jenkins		*		••••					
Drill Company:Macquarie DrillingDate Commenced:15/05/2008Drill Model:Mac200Date Completed:15/05/2008Hole Diameter (mm):50Logged/checked by:K.Weir/L.Jenkins									
Drill Company:Macquarie DrillingDate Commenced:15/05/2008Drill Model:Mac200Date Completed:15/05/2008Hole Diameter (mm):50Logged/checked by:K.Weir/L.Jenkins									
Drill Company:Macquarie DrillingDate Commenced:15/05/2008Drill Model:Mac200Date Completed:15/05/2008Hole Diameter (mm):50Logged/checked by:K.Weir/L.Jenkins	-								
Drill Model:Mac200Date Completed:15/05/2008Hole Diameter (mm):50Logged/checked by:K.Weir/L.Jenkins	5								
Drill Model:Mac200Date Completed:15/05/2008Hole Diameter (mm):50Logged/checked by:K.Weir/L.Jenkins	Dri	ll Comp	any:	Macquarie Drill	ing	Date Con	nmenced:	15/0	5/2008
		-	-	Mac200		Date Con	npleted:	15/0	5/2008
Sheet: 1 of 1	Ho	le Diam	eter (n	nm): 50		Logged/c	hecked b	y: K.W	eir/L.Jenkins
									Sheet: 1 of 1

ſ

Pro	ject ID:	CES	050706	-BCC	Easting:	329795.	443				•	
Pro	ject:	ESA			Northing	g: 6243093	3.234	Ξ	₹		EAR SCIE	ENTIS TS
Clie	ent:	Boyd	Cooks	Cove	Elevatio	n: 1.88		26-3	32 Pirra	ima Roa	ad Pyrmo	wer Level Suite 121 nt 2009 : (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Enviro	onmen	ntal	Log	j :	A	BH292
DF	RILLING	INFO.		LITHOLOGY		SAMP	LING IN					
Depth	Method	Water	Symbol	Description		Sample ID	Туре	0	FID/F 520	q) Dl	pm)	WELL DETAIL
	Direct Push	×		 FILL: Grass over silty sand tops brown, fine to medium grained, in and loose. FILL: Sand, yellow, fine to media grained, moist and loose with as gravels at 0.8-0.9m FILL: Clayey silt, brown/orange mottles, dense and moist FILL: Silty sand, yellow, fine to medium grained, with shells and gravels FILL: Silty clay, grey/brown, den moist with orange mottles FILL: Sand, pale grey, medium grained, moist and loose with shells FILL: Silty sand, grey, dense and moist with shells FILL: Clayey silt, grey dense and moist with shells FILL: Clayey silt, grey dense and moist with shells FILL: Clayey silt with trace sand black, dense and moist with ash glass and gravels. Refusal on sandstone fill at 1.9mBGL 	moist um sh 13 1 as 13 1 as 13 14 15 14 15 14 15 14 15 14 14 15 14 14 15 14 14 15 14 14 14 15 14 14 14 14 14 14 14 14 14 14 14 14 14	0508-325-KW 0508-326-KW	Push Tube Push Tube					
Dril	II Comp	any:	ſ	Macquarie Drilling		Date Co	mmen	ced	:	1	3/05/	2008
Dril	II Mode	l:	Γ	Mac200		Date Co	mplete	ed:		1	3/05/	2008
Hol	e Diam	eter (n	nm):	50		Logged	/check	ed I	by:	K		r/L.Jenkins
											S	heet: 1 of 1

Pro	ject ID:	CES	050706	-BCC Ea	asting:	329831.8	92					
Pro	ject:	ESA		N	orthing:	6243084.	592		₹	1		IN TIS TS
Clie	ent:	Boyd	Cooks	Cove El	levation:	1.91		26-32	2 Pirran	na Roa	d Pyrmor	wer Level Suite 121 ht 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Enviror	nmen	tal I	Log	:	A	BH293
DI	RILLING	INFO.		LITHOLOGY		SAMPL	ING IN					
Depth	Method	Water	Symbol	Description	S	ample ID	Туре	F O	520 DI	1 D (pr	150 mc	WELL DETAIL
0	\uparrow			FILL: Grass over sand topsoil, dark								
				FILL: Crushed sandstone (white/brown), brown with silt, clay a ash at 0.4-0.5m	and 1305()8-328-KW	Push Tube					
				FILL: Silty clay, brown/orange, mois firm with charcoal and gravels	st,							
1-				FILL: Crushed sandstone, orange, course grained and moist								
	- usu			FILL: Silty sand, brwon/grey with charcoal								
	Direct Push	¥		FILL: Sand, pale grey, fine to mediu	um 🚬	08-329-KW	Push Tube					
2	D			grained with silt lenses and shells. V at 1.4m	Wet							
				SILTY CLAY: Silty clay, dark grey, f and moist with shells	firm 13050	08-330-KW	Push Tube					
	\checkmark			SILT: Silt, black, fine grained and fir								
3 - - - - - - - - - - - - - - - - - - -				EOH at 2.8mBGL (targeted depth	h)							
	ll Comp	any:	Ν	Macquarie Drilling		Date Con	nmen	ced:	:	13	3/05/2	2008
	Drill Model: Mac200					Date Con				13	3/05/2	2008
Hol	le Diam	eter (r	nm): 5	50		Logged/c	-		y:	K.	Weir	/L.Jenkins
											Sł	neet: 1 of 1

Pro	ject ID:	CES	050706	-BCC E	Easting:	329858.6	69				
Pro	ject:	ESA		М	Northing:	6243120.	087	-7			NTIS TS
Clie	ent:	Boyd	Cooks	Cove E	Elevation:	1.70		26-32 Pirr	ama Roa	d Pyrmor	ver Level Suite 121 nt 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Enviror	nment	tal Lo	g:	A	BH294
D	RILLING	INFO.		LITHOLOGY		SAMPL	ING INF				
Depth	Method	Water	Symbol	Description	Sa	imple ID	Туре	0 250 JII	PID (p 005	750 uc	WELL DETAIL
0											
-	\uparrow			FILL: Grass over silty sand, dark brown, moist and roots	15050	8-367-KW	Push Tube				
-				FILL: Silty clayey sand, dark brown gravels, firm and moist with shells	n,						
- - - 1- - -				FILL: Silty clay, brown/grey, firm and dry with rootlets	nd	8-368-KW	Push Tube				
- - - - - - 2-	Direct Push	¥		FILL: Sand, grey, silty, fine to med grained with shells and wet from 1							
-				FILL: silty clay, dark grey, soft and	wet 15050	8-369-KW	Push Tube				
-			· · · · · · · · · · · · · · · · · · ·	SAND: Sand, grey, silty, medium grained and wet with shells							
-				SILTY CLAY: Silty clay, dark grey, and wet	soft						
3- - - - - - - - - - - - - - - - - - -				EOH at 2.8mBGL (targeted dep	th)						
5			n	Macquaria Drilling		Dete O-			4	5/05/2	2008
	II Comp II Mode			Macquarie Drilling Mac200		Date Con Date Con				5/05/2	
	le Diam					Logged/c	-				/L.Jenkins
		erei (li				Logyeu/U	IICUN	su by.	r.		neet: 1 of 1
										0	

Pro	ject ID:	CES	050706	-BCC Ea	asting:	329741.1	67					
Pro	ject:	ESA		No	orthing:	6243137.	961	-	₹			INTIS TS
Clie	nt:	Boyd	Cooks	Cove Ele	evation:	2.02		26-3	2 Pirrar	na Roac	Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	e - Area A		Enviror	nmen	tal	Log	:	A	BH295
DF	RILLING	NFO.		LITHOLOGY		SAMPL	ING IN					WELL DETAIL
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре	0	520 F ID/P	ID (pp	m) 120	
	Direct Push	¥		FILL: Grass over silty sand topsoil, figrained, dry and loose with roots FILL: Sand, yellow, fine to medium grained, loose and dry with shells. Moist at 1.4m. Wet at 1.6m with silt lenses Moist at 1.4m. Wet at 1.6m with silt lenses FILL: Silty clay, dark grey, firm and moist FILL: Sand, pale grey, medium grained, wet and dense	13050	18-324-KW / 18-322-KW /	Push Tube Push Tube					
				FILL: Silty clay, dark grey, firm and moist SAND: Silty sand, dark grey, moist, dense with slight H2S odour EOH at 2.8mBGL (targeted depth	••••••••••••••••••••••••••••••••••••••							
Dril	ll Comp	any:	ſ	Macquarie Drilling		Date Con	nmen	ced	:	13	/05/2	2008
	ill Model: Mac200					Date Con	nplete	ed:		13	/05/2	2008
Hol	Drill Model: Hole Diamete		nm): १	50		Logged/c	heck	ed k	oy:	K.'		/L.Jenkins heet: 1 of 1

Pro	ject ID:	CES	050706	-BCC Eas	sting:	329442.0	22					
Pro	ject:	ESA		Νοι	thing:	6243279.	278			- s		NTIS TS
Clie	ent:	Boyd	Cooks	Cove Ele	vation:	1.42		26-32	Pirrama	a Road	Pyrmor	ver Level Suite 121 it 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	e - Area A		Enviro	nmen	tal L	_og:		A	BH296
D	RILLING	INFO.		LITHOLOGY		SAMPL	ING IN					
Depth	Method	Water	Symbol	Description	s	ample ID	Туре		319/DI	2 (ppr) 2 200		WELL DETAIL
0									1 :			
-	\uparrow			FILL: Grass over silty topsoil, dark brown, dense and moist with roots	1205	08-261-KW	Push Tube					
				FILL: Sand, pale brown, fine grained, loose and dry			Push	\bullet				
- - - - - 1- -				FILL: Silty sand, dark brown, fine grained, dense and moist		08-262-KW	Tube					
	Direct Push	¥		SAND: Sand, pale grey, fine to medium grained, loose to moderately dense, moist with trace silt lenses and roots								
2	~				1205	08-263-KW	Push Tube	-				
3				EOH at 2.8mBGL (targeted depth)								
Dri	ll Comp	anv	r	Macquarie Drilling		Date Con	nmen	ced.		12/	/05/2	2008
	ll Mode			Mac200		Date Con						2008
	le Diam					Logged/o	-		y:		Veir	/L.Jenkins
											Sł	neet: 1 of 1

Project ID:	CES	050706	S-BCC E	Eastir	ng: :	329954.7	741					
Project:	ESA		٩	North	ing: (6243567	.285	Ξ	₹			RTH ENTIS TS
Client:	Boyd	Cooks	Cove E	Eleva	tion:	1.82		26-3	32 Pirra	ama Ro	ad Pyrm	ower Level Suite 121 ont 2009 K: (02) 9552 4399
Location:	Cook	s Cove	e - Area A			Enviro	nmen	tal	Lo	g:		ABH297
DRILLING	INFO.		LITHOLOGY			SAMPL	ING IN					
Depth Method	Water	Symbol	Description		Sam	ple ID	Туре	0	FID/I	1) OI C	220 mq	WELL DETAIL
0 	•		ASPHALT: Bitumen FILL: Sand, dark brown, fine to medium grained, loose and dry wit gravels and shell fragments FILL: Sand, yellow, fine grained, lo dry and odourless FILL: Silty sand, dark grey, fine grained, loose, dry and odourless SANDSTONE: Sanstone, yellow/white/orange, course grained moist and odourless. Refusal on sandstone bedrock at 1.3mBGL	005e,	090508-	-166-KW -164-KW -165-KW -166-KW -181- KW	Push Tube Push Tube Push Tube					
Drill Comp Drill Mode			Macquarie Drilling Mac200			Date Cor Date Cor			1:			/2008 /2008

Hole Diameter (mm): 50

Date Commenced:09/05/2008Date Completed:09/05/2008Logged/checked by:K.Weir/L.Jenkins
Sheet:Sheet:1 of 1

Pro	ject ID:	CES	050706	S-BCC	Easti	ng:	329957.2	70					SULTING
Pro	ject:	ESA			North	ning:	6243565.	596	Ξ	₹	- 1	EAR SCIE	TH NTISTS
Clie	ent:	Boyd	Cooks	Cove	Eleva	tion:	1.97		26-3	2 Pirran	na Road	Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	e - Area A			Enviror	nmen	tal	Log	:	Α	BH298
D	RILLING I	NFO.		LITHOLOGY			SAMPL	ING IN					WELL DETAIL
Depth	Method	Water	Symbol	Description		Sa	Imple ID	Туре	0	520 FID/PI	D (pp)	m) 120	
0 - - - - - - - - - - - - -	Direct Push			ASPHALT: Bitumen FILL: Sand, brown, fine to medium grained, looseand dry with gravel shells and trace clay FILL: Silty sand, dark brown, fine grained, dry, loose and odourless FILL: Sand, yellow, fine to medium grained, loose and dry. EOH at 1.5mBGL (targeted deglession)	ns,		8-167-KW	Push Tube					
	ll Comp Il Model			Macquarie Drilling Mac200			Date Con Date Con			:		/05/2 /05/2	
Но	le Diamo	eter (n	nm):	50			Logged/c	heck	ed k	oy:	K.\		/L.Jenkins neet: 1 of 1

Project ID:	CES0	50706	-BCC Ea	astin	g: 329956.	887				SULTING
Project:	ESA		No	orthi	ng: 6243568	3.981	₹		EAR SCIE	TH INTISTS
Client:	Boyd	Cooks	Cove Ele	evat	ion: 1.86		26-32 Pirr	ama Roa	d Pyrmor	ver Level Suite 121 t 2009 (02) 9552 4399
Location:	Cooks	s Cove	- Area A		Enviro	onment	al Lo	g:	A	BH299
DRILLING I	NFO.		LITHOLOGY		SAMP	LING INF				
Depth Method	Water	Symbol	Description		Sample ID	Туре	FID 550 JI	PID (p)	120 mo	WELL DETAIL
Deptit method			ASPHALT: Bitumen FILL: Sand, brown, fine to medium grained, loose, dry with gravels, shell and charcoal FILL: Sand, grey/brown, fine grained, loose, dry to moist and odourless FILL: Sand, yellow, fine grained, dense, dry and odourless FILL: Sitty sand, dark grey, fine grained, dry, loose and odourless FILL: Sandstone, yellow/orange, course grained and moist. Refusal or sandstone at 1.5mBGL	IIS J,	090508-168-KW 090508-169-KW 090508-170-KW 090508-182-KW 090508-183-KW	Hand Auger Hand Auger Push Tube			122	

Drill Company: Macquarie Drilling

Drill Model:

Mac200

Hole Diameter (mm): 50

Date Commenced:09/05/2008Date Completed:09/05/2008Logged/checked by:K.Weir/L.Jenkins
Sheet:Sheet:1 of 1

Project ID:	CES	050706-BCC	Easting	g: 329957.5	65		SULTING
Project:	ESA		Northin	ng: 6243566.	.232 🔫		TH INTISTS
Client:	Boyd	Cooks Cove	Elevatio	on: 2.16	26-32 Pirrama	Road Pyrmor	ver Level Suite 121 it 2009 (02) 9552 4399
Location:	Cook	s Cove - Area A		Enviro	nmental Log:	A	BH2100
DRILLING	INFO.	LITHOLO	GY	SAMPL			WELL DETAIL
Depth Method	Water	Symbol Descripti	on	Sample ID		(ppm)	WELL DETAIL
0 		ASPHALT: Bitumen FILL: Sand, brown, f dry, gravesl, brick, b and odourless FILL: Sand, grey, fin odourless FILL: Sand, yellow/g dry, loose and odour FILL: Silty sand, dar grained, loose and d SANDSTONE: Oran sandstone, fine grain SANDSTONE: Sand moist EDH at 6.5mBGL	ine grained, loose, lue metal, sheells e grained, dry and rrey, fine grained, rless k grey, fine lry ge/yellow hed and dry Istone, white and	D90508-171-KW D90508-172-KW D90508-173-KW D90508-180-KW D90508-179-KW	Hand Auger Hand Auger Push Tube Push Tube		
7							
Drill Comp	-	Macquarie Drillir	ng		nmenced:	21/05/2	
Drill Mode		Mac200		Date Con	-	21/05/2	
Hole Diam	eter (n	iiiii): 73		Logged/0	checked by:	Jenkin	s/vveir neet: 1 of 1

Project ID:	CES	050706	-BCC Eas	ting:	329960.2	173					
Project:	ESA		Nor	thing:	6243565	.265		₹	1	AR SCIE	NTIS TS
Client:	Boyd	Cooks	Cove Elev	vation:	2.16		26-32	Pirram	na Road	Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Location:	Cook	s Cove	- Area A		Enviro	nmen	tal L	_og	:	Α	BH2101
DRILLING	INFO.		LITHOLOGY		SAMPL	LING IN					WELL DETAIL
Depth Method	Water	Symbol	Description	S	ample ID	Туре	• F		1 qq) D	n) nc/	
0 	2- 		ASPHALT: Bitumen FILL: Sand, brown, fine grained, loose dry with gravels and blue metals FILL: Sand, grey, fine grained, loose dry and odourless FILL: Sand, yellow/brown, fine grained, loose, dry and odourless FILL: Silt sand, dark brown, fine grained, dry, loose and odourless SANDSTONE: Weathered sandstone, white/orange, moist and odourless EOH at 1.7mBGL (refusal on sandstone bedrock)	09050	08-174-KW 08-175-KW 08-176-KW 08-176-KW 08-178-KW	Hand Auger Hand Auger Push Tube Push Tube					
5									00	<u>ار م</u>	2008
Drill Comp	-		/lacquarie Drilling /lac200		Date Cor Date Cor						2008 2008
								y:			/L.Jenkins
Hole Diameter (er (mm): 50		Logged/checked by:				-	Sheet: 1 of 1		

Project ID:	CES	050706	-BCC Ea	asting:	329960.9	84					
Project:	ESA		No	orthing:	6243570.	536		₹		AR CIE	NTIS TS
Client:	Boyd	Cooks	Cove El	evation:	2.16		26-32	2 Pirram	na Road	Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Location:	Cook	s Cove	- Area A		Enviror	nmen	tal I	Log	:	Α	BH2102
DRILLING I	NFO.		LITHOLOGY		SAMPL	ING IN					
Depth Method	Water	Symbol	Description	Sa	mple ID	Туре	F ٥	10/PI	D (ppi	n)	WELL DETAIL
0 - - - - - - - - - - - - -	×		ASPHALT: Bitumen and blue metal FILL: Crushed sandstone fill, pale brown/orange, course grained, sandstone gravels, loose and dry FILL: Sand, grey/brown, loose and c with black gravels FILL: Crushed brick, red. hard and d FILL: Sand, pale brown, fine grained moderately dense dry FILL: Silty sand, dark brown, fine grained, moderately dense and dry FILL: Silty sand, dark brown, medium grained and dry to moist FILL: Silty sand with trace clay, dark brown/grey. Wet at 1.6m <u>FILL: Sand, pale grey with silt lenset</u> and wet. Refusal on sandstone at 2.0mBGL	dry dry 09050 d, d, 09050	8-185-KW 8-186-KW 8-187-KW	Push Tube Push Tube					
5									00	05 10	2008
Drill Comp			/lacquarie Drilling /lac200		Date Con Date Con						2008 2008
						-		y:			/L.Jenkins
Hole Diameter (mm):		, .			Logged/checked by:				Sheet: 1 of 1		

Pro	ject ID:	CES	050706	-BCC Easti	ng: 329920.1	46				
Pro	ject:	ESA		North	ning: 6243581	.574	7		NTIS TS	
Clie	ent:	Boyd	Cooks	Cove Eleva	ation:		26-32 Pirra	y Wharf 19-21, Lov ama Road Pyrmon 3569 2200 FAX:		
Loc	ation:	Cook	s Cove	- Area A	Enviro	nment	tal Log	g: A	BH2103	
DI	RILLING	INFO.		LITHOLOGY	SAMPL	ING INF			WELL DETAIL	
Depth	Method	Water	Symbol	Description	Sample ID	Туре	FID/I 520	PID (ppm) ¹⁰⁰	WELL DETAIL	
	Direct Push	▼		ASPHALT: Bitumen FILL: Sand, brown, fine grained, loose, dry to moist with gravels and shells. Terracota at 0.3m. Moist with orange mottles at 0.9m and gravels FILL: Sand, grey with silt lenses, fine to medium grained, wet from 1.4m. Saturated from 1.4-2.8m FILL: Silty clayey sand, brown, soft and saturated with several shells EOH at 2.8mBGL (targeted depth)	090508-195-KW 090508-194-KW 090508-196-KW 090508-197-KW 090508-199-KW	Hand Auger Hand Auger Hand Auger Push Tube				
Dri	ll Comp	any:	ſ	Macquarie Drilling	Date Cor	nmenc	ed:	09/05/2	2008	
Dri	ll Mode	l:	ľ	Mac200	Date Cor	nplete	d:	09/05/2	2008	
Hol	le Diam	eter (n	nm): 5	50	Logged/	checke	ed by:		/L.Jenkins	
							Sheet: 1 of 1			

Proj	ject ID:	CES)50706 [.]	-BCC East	ing: 329920	.146			
Proj	ject:	ESA		Nort	hing: 624358	1.574	₹		NTIS TS
Clie	nt:	Boyd	Cooks	Cove Elev	ation: 1.89		26-32 Pirra	Wharf 19-21, Lov ma Road Pyrmon 569 2200 FAX:	ver Level Suite 121 t 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A	Enviro	onment	tal Log	g: A	BH2104
DR	RILLING	INFO.		LITHOLOGY	SAMF	PLING INF			
Depth	Method	Water	Symbol	Description	Sample ID	Туре	0 550 FID/P	200 (ppm)	WELL DETAIL
	Direct Push	¥		FILL: Sand, brown, fine to medium grained, loose and moist with gravels FILL: Sand, yellow, fine grained and odourless. Grading to grey/yellow, fine to medium grained and wet FILL: Sand, silty brown, fine grained, moist, dense and wet at 1.5m FILL: Sand, grey, medium grained, wet and dense FILL: Sailty clayey sand, grey/brown, dense and wet with shells	090508-198-KW 090508-334-KW 090508-335-KW 090508-349-KW	Hand Auger Hand Auger Hand Auger			
4				FILL: Sand, pale grey, course grained, dense, wet and odourless EOH at 4.0mBGL (targeted depth)	090508-350-KW	Push Tube	•		
5									
			-		_		_	00/0=/	
	l Comp I Mode	-		/lacquarie Drilling /lac200	Date Co			09/05/2	
	e Diam					omplete I/checke		09/05/2 K Weir	/L.Jenkins
		(II		~~	Logged	JUIGON	Ny.		neet: 1 of 1

Project I	D: CES	050706	-BCC Ea	asting:	329916.3	377					SULTING
Project:	ESA		N	orthing:	6243589	.938		₹	<u>ا م</u>		NTISTS
Client:	Boyc	l Cooks	Cove El	levation:	1.98		26-32	2 Pirram	na Road	Pyrmon	rer Level Suite 121 t 2009 (02) 9552 4399
Location	: Cool	ks Cove	e - Area A		Enviro	nmen	tal	Log	:	Α	BH2105
DRILLIN	g info.		LITHOLOGY		SAMPL	ING IN					
Depth Metho	d Water	Symbol	Description	Sa	mple ID	Туре	• •	10/DI =	D (ppi 200	n) ng/	WELL DETAIL
0 - - - - - - - - - - - - -			FILL: Gravels FILL: Clayey sand, orange/grey, course grained, odourless and mois large boulder rocks, sandstone and concrete. Very strong, hydrocarbon odour from 1m UNKNOWN: Core loss UNKNOWN: Core loss SAND: Sand grey, fine to medium grained, saturated, hydrocarbon odo and loose SAND: Brown sand, fine to medium grained with no odour EOH at 4.0mBGL (targeted depth	15050 15050 0ur 15050	8-323-KW 8-333-KW 8-346-KW 8-600-KW	Hand Auger Hand Auger					
		,			Data Oca		a e -l		15	/05/2	2008
Drill Cor			Macquarie Drilling Mac200		Date Cor Date Cor			•		/05/2 /05/2	
Hole Dia			75		Logged/	-					weir
	merei (I				Logged/		GU N	, y .	161		eet: 1 of 1
										0	

Pro	ject ID:	CES	050706	-BCC Ea	asting:	329905.0	57				
Pro	ject:	ESA		N	orthing:	6243586.	237	₹			NTIS TS
Clie	ent:	Boyd	Cooks	Cove El	levation:	2.25		26-32 Pirr	ama Roa	ad Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	e - Area A		Enviror	nment	al Lo	g:	Α	BH2106
D	RILLING	INFO.		LITHOLOGY		SAMPL	ING INF				
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре	FID 550	PID (p	220 m)	WELL DETAIL
0											
-				ASPHALT: Bitumen FILL: Silty brown topsoil, fine graine	ed 09050)8-204-KW	Push Tube				
-				And moist FILL: Sand, brown, loose, moist with	/						
-				shells and gravels							
- 1				FILL: Brick, yellow sandstone and moist							
-	Direct Push -	¥		FILL: Sand, yellow, medium grained moderately dense with shells and moist. Saturated at 2.0m	1, 09050	08-205-KW	Push Tube				
-	- Direct	_									
-											
2-											
-				FILL: Sand, grey, medium grained, moderately dense with shells and moist. Saturated at 2.0m							
-	\downarrow			FILL: Silty clay, grey, soft and wet w H2S odour	vith 09050)8-206-KW	Push Tube				
3-				EOH at 2.8mBGL (targeted depth	ו)						
-											
-											
-											
4-											
-											
-											
-											
5	/L						-	I			
	ll Comp	-		Macquarie Drilling		Date Con				9/05/2	
	ll Mode			Mac200		Date Con	-			9/05/2	
Ho	le Diam	eter (n	nm):	50		Logged/c	hecke	ed by:	K		L.Jenkins
										Sr	eet: 1 of 1

Project II	D: CES	050706	-BCC Easti	ng: 329919	9.941				
Project:	ESA		North	ning: 624359	90.875				RTH ENTISTS
Client:	Boyd	Cooks	Cove Eleva	ation:		26-32 P	irrama F	Road Pyrm	ower Level Suite 121 ont 2009 X: (02) 9552 4399
Location	: Cook	s Cove	e - Area A	Envir	onmen	ital Lo	og:		ABH2107
DRILLIN	g INFO.		LITHOLOGY	SAM	PLING IN				
Depth Metho	d Water	Symbol	Description	Sample ID	Туре	FIE 0 ک ^{ور}		220 (mqq)	WELL DETAIL
			CONCRETE: Concrete						
-			FILL: Silty sand topsoil, fine to medium grained, moist and odourless with gravels	150508-339-KW	Hand Auger				
Direct Push			FILL: Sand, brown/grey, fine to medium grained, gravels and odourless	150508-340-KW	Hand Auger				
	.		FILL: Rocks, sand, grey becoming brown, moist to wet with strong hydrocarbon odour and surface sheen.	150508-341-KW	Hand Auger				•
			EOH at 1.6mBGL due to access	150508-342-KW	Hand Auger	_			•
2 - - - - - - - - - - - - - - - - - -			restrictions						
Drill Company: Macquarie Drilling			Vacquarie Drilling	Date C	ommen	ced:		15/05/	/2008
Drill Mod	lel:	Ν	Mac200	Date C	omplete	ed:		15/05/2008	
Hole Diameter (mm): 50			50	Logged/checked by: K.Weir/L.Jenkin: Sheet: 1 of			ir/L.Jenkins Sheet: 1 of 1		

Project ID:	CES	050706	-BCC East	ing: 329921.	.010	-		
Project:	ESA		Nort	hing: 624358	6.932		🥄 sci	ENTIS TS ower Level Suite 121
Client:	Boyd	Cooks	Cove Elev	ation:		26-32 Pirram	a Road Pyrmo	
Location:	Cook	s Cove	- Area A	Enviro	onmen	tal Log	: /	ABH2108
DRILLING	INFO.		LITHOLOGY	SAMP	PLING IN		ON D (ppm)	WELL DETAIL
Depth Method	Water	Symbol	Description	Sample ID	Туре		750	
0			CONCRETE: Concrete					
-			FILL: Sand, yellow, fine grained, most to dry. Rocks at 0.3m	150508-343-KW	Hand Auger			
-			FILL: Silty sand, dark brown, fine grained with trace clay, moist with slight HC odour	/	Hand Auger	-		
			FILL: Very strong Hydrocarbon odour	/				
					_	_		
-			FILL: Silty sand, dark grey, fine to	150508-345-KW	Hand Auger			
	¥		medium grained, wet with shells and hydrocarbon odour					
2								
Direct Push								
- Direo								
-								
3				150508-347-KW	Push Tube			
-								
-			SAND: Sand, pale grey, silty lenses,	_				
4			odourless and moist					
-				150508-348-KW	Push Tube			
			EOH at 4.5mBGL (targeted depth)					
5								
Drill Comp	anv [.]	N	Macquarie Drilling	Date Co	mmen	ced:	15/05/	2008
Drill Mode	-		Mac200	Date Co			15/05/	
Hole Diam	eter (r	nm): 5	50	Logged	-		K.Wei	r/L.Jenkins
							S	heet: 1 of 1

Proj	ject ID:	CES	050706	-BCC	Easting:	329905.	057				
Proj	ject:	ESA			Northing	: 6243586	6.237				EN TIS TS
Clie	nt:	Boyd	Cooks	Cove	Elevatio	1: 2.25		26-32 F	Pirrama	Road Pyrmo	ower Level Suite 121 ont 2009 : (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Enviro	onmen	tal L	og:	A	ABH2109
DF	RILLING	NFO.		LITHOLOGY		SAMP	LING IN				
Depth	Method	Water	Symbol	Description		Sample ID	Туре		D/PID	150 (ppm)	WELL DETAIL
	Direct Push			FILL: Gravels and roadbase FILL: Silty sand, dark brown, fin medium grained, moist and odo FILL: Sand, grey, fine to mediur grained, moist and odourless FILL: Sand, pale grey, fien to m grained, dense, odourless and with the second stress of the second stress and with the second stress of the second stress and with the second stress of	ie to urless 150 m edium wet at fine to se 150	D508-336-KW	Hand Auger Hand Auger Push Tube				
			-			_				4 = 16 = 1	
	I Comp			Macquarie Drilling		Date Co				15/05/	
	I Mode			Mac200		Date Co	-			15/05/	
Hol	e Diam	eter (n	nm): 5	50		Logged	/check	ed by	/:		r/L.Jenkins
										S	heet: 1 of 1

Projec	t ID:	CES	050706	-BCC	Easting:	329956.9	98				
Projec	et:	ESA			Northing:	6243565.	240			^r sci	RTH ENTISTS
Client	:	Boyd	Cooks	Cove	Elevation:	1.9		26-32 Pi	rrama F	load Pyrmo	ower Level Suite 121 ont 2009 K: (02) 9552 4399
Locati	ion:	Cook	s Cove	- Area A		Enviror	nmen	tal Lo	og:	4	ABH2110
DRIL	LING I	NFO.		LITHOLOGY		SAMPL	ING IN				WELL DETAIL
Depth Me	ethod	Water	Symbol	Description	s	ample ID	Туре	0 055 0		750 dd)	WELL DETAIL
	Direct Push			ASPHALT: Bitumen FILL: Sand, brown, fine grained dry, gravesl, brick, blue metal, s and odourless FILL: Sand, grey, fine grained, c odourless FILL: Sand, yellow/grey, fine gra dry, loose and odourless FILL: Silty sand, dark grey, fine grained, loose and dry SANDSTONE: Orange/yellow sandstone, fine grained and dry EOH at 2.0mBGL (targeted designs)	heells dry and ained,						
Drill C	Compa	anv:	ľ	Macquarie Drilling		Date Con	nmen	ced:		21/05/	/2008
Drill N				Mac200		Date Con				21/05/	
Hole [Hole Diameter		n m): 7	75		Logged/c	heck	ed by:	: .	Jenkir	ns/Weir
						55 ,					Sheet: 1 of 1

Project ID:	CES	050706-BCC	Easting:	329464.9	51		
Project:	ESA		Northing:	6243255.4			NTIS TS
Client:	Boyd	Cooks Cove	Elevation:	1.09	26-32 Pirram	a Road Pyrmon	ver Level Suite 121 it 2009 (02) 9552 4399
Location:	Cook	s Cove - Area A		Environ	mental Log	: A	LG201
DRILLING I	NFO.	LITHOLOGY		SAMPLI			WELL DETAIL
Depth Method	Water	Symbol Description	s	ample ID		D (ppm) 052 005	
0 	¥	FILL: Grass over silty sand to dark brown, moist, roots and figrained FILL: Sand, brown, fine to me grained, moist, loose with roo trace silt FILL: Silty sand, brown, fine g dense and moist SAND: Sand, pale grey, fine t medium grained, moderately with silt lenses. Saturated from 2.6m. H2S odour at 2.0m SAND: Silty sand, brown, fine dense and moist EOH at 2.8mBGL (targeted	dium ts and 1205 rrained, 1205 o dense n 1.5- 1205 grained,	08-267-KW 08-268-KW 08-269-KW	Push Tube Push Tube		
3- 	:	Macquarie Drilling Mac200		Date Com Date Com	pleted:	12/05/2	2008
Hole Diame	eter (n	nm): 75		Logged/c	hecked by:	Jenkins St	s/Weir neet: 1 of 1

Project	ID:	CESC)50706 ⁻	-BCC East	ing:	329556.7	12					
Project	:	ESA		Nort	hing:	6243218.	788		₹	<u>ر</u>		NTIS TS
Client:		Boyd	Cooks	Cove Elev	ation:	1.68		26-32	Pirran	na Road	Pyrmon	ver Level Suite 121 it 2009 (02) 9552 4399
Locatio	on:	Cook	s Cove	- Area A		Enviro	nmen	tal L	_og	:	Α	LG202
DRILL	ING IN	IFO.		LITHOLOGY		SAMPL	ING IN					
Depth Met	hod V	Nater	Symbol	Description	Sa	ample ID	Туре		10/PI	D (pp)	n) 09/	WELL DETAIL
0 				FILL: Grass over silty sand topsoil, fine grained with roots FILL: Sand, pale brown, fine grained, dry and loose with sandstone fragments (white), minor coal fragments. Orange/red mottles FILL: Clay, red/brown/orange/grey mottles, coal fragments, pebbles and dry to moist FILL: Silty sand, fine to medium grained, loose and wet . Saturated from 1.5-2.0m FILL: Silty clay, brown, moist and soft SILTY SAND: Silty sand, pale grey, dense and moist with silt lenses EOH at 2.8mBGL (targeted depth)	12050)8-270-KW)8-272-KW)8-271-KW	Push Tube Push Tube		32		<u>2</u>	
Drill Mo	-				Date Commen Date Complete Logged/check			ted: 12/05/2 ked by: Jenkin			2008	

Pro	ject ID:	CES	050706	-BCC Eas	ting:	329702.7	'91				
Pro	ject:	ESA		Nor	thing:	6243184.	299	-7	s		ITIS TS
Clie	ent:	Boyd	Cooks	Cove Elev	vation:	1.98		26-32 Pirra	ima Road F	Pyrmont 2	r Level Suite 121 2009 2) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Enviro	nment	al Log	g:	Al	_G203
D	RILLING	INFO.		LITHOLOGY		SAMPL	ING INF				WELL DETAIL
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре	FID/F 520	2500 OIA		
0	\frown			FILL: Grass over silty sand topsoil, dark brown, fine grained, dry to moist	13050	08-317-KW	Push Tube				
_				FILL: Silty sand, dark brown, fine grained, dense and dry to moist							
-				FILL: Silty sand, yellow, fine grained, moist and loose							
-				FILL: Sand, yellow, medium grained, loose, moist with shells and silt lenses orange mottles and wet at 1.5m	, 13050)8-318-KW	Push Tube				
	Auger Solid Flight -										
-	ger Sc	¥									
- - -	Au			FILL: Sand, grey, fine to medium grained, moderately dense, wet with shells							
2				FILL: Silty clay, dark brown, moist and soft							
	\checkmark			SILTY SAND: Silty sand, dark brown/grey, moist and soft							
				EOH at 2.8mBGL (targeted depth)							
3											
4-											
-											
5							1				
Dri	Drill Company: Macquarie Drilling			Macquarie Drilling	Date Commenced:				12/	05/20	008
Dri	Drill Model: Mac200			Mac200		Date Con	nplete	d:	12/05/2008		
Но	Hole Diameter		nm): 7	75		Logged/o	checke	d by:	Jen		Weir
	nois Biamete.									She	et: 1 of 1

Project ID:	CES	050706-BCC	Eastii	n g: 329801.4	119		
Project:	ESA		North	i ng: 6243134			NTISTS
Client:	Boyd	Cooks Cove	Eleva	tion: 1.54	26-32 Pirram	Vharf 19-21, Low na Road Pyrmont 69 2200 FAX: (
Location:	Cook	s Cove - Area A		Enviro	nmental Log	: A	LG204
DRILLING	NFO.	LITHOL	.OGY	SAMPI	ING INFORMATI		
Depth Method	Water	Symbol Descri	ption	Sample ID		D (ppm) 120 022	WELL DETAIL
0 	*	brown, moist with FILL: Sand, yellow grained, loose, dr 1.4m FILL: Sand, grey, grained, wet and o FILL: Silty clay, da moist FILL: Silty clay, da FILL: Silty clay, da	w, fine to medium y, shells. Wet at fine to medium dense ark grey, firm to moist fine to medium dense ark brown, firm and	150508-376-KW	Push Tube		
4 	:	Macquarie Dril Mac200 nm): 75	ling	Date Co	mmenced: mpleted: checked by:	15/05/2 15/05/2 Jenkins Sh	008

Pro	ject ID:	CES	050706	-BCC Ea	asting:	329892.5	571				
Pro	ject:	ESA		N	orthing:	6243104	.247	4			RTH IENTIS TS
Clie	nt:	Boyd	Cooks	Cove E	levation:	2.49		26-32	Pirrama	Road Pyrr	Lower Level Suite 121 nont 2009 X: (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Enviro	nmen	tal L	.og:		ALG205
DF	RILLING	INFO.		LITHOLOGY		SAMPL	ING IN				
Depth	Method	Water	Symbol	Description	Sa	mple ID	Туре			(ppm)	WELL DETAIL
0				FILL: Grass on silty sand, dark brow firm, dry to moist FILL: Sand, yellow, fine to medium grained, loose, dry, grading to grey		8-363-KW	Push Tube				
- - - 1 - - - - - - - - - - -	ight	¥		FILL: Silty clay, lense, brown, dry w roots FILL: Sand, pale grey, fine to mediu grained, moist, sandstone gravels w charcoal and ash FILL: Silty clay, dark brown, soft and moist FILL: SSand, pale brown, fine to medium grained, wet at 1.4m, shells	um 15050 vith d	8-364-KW	Push Tube				
2	Auger Solid Flight			and moderately dense FILL: Silty clay, dark brown/grey, so and wet FILL: Silt, black, fine grained, organ FILL: Crushed sandstone, grey and white	nics	8-365-KW	Push Tube	•			
3			××××.	SILTY CLAY: Silty clay, shells, mois to wet with H2S odour		8-366-KW	Push Tube				
				EOH at 4.2mBGL (targeted depth	h)						
	ll Comp	•		Aacquarie Drilling		Date Cor					5/2008
	I Mode			Mac200		Date Cor	-				5/2008
Hol	e Diam	eter (n	nm): 7	75		Logged/o	checke	ed by	y :		ns/Weir Sheet: 1 of 1

Project ID:	CES	050706-BCC	Easti	ng: 3	329967.0	76				
Project:	ESA		North	ning: 6	6243101.2	231	-7	<u> </u>		NTIS TS
Client:	Boyd	Cooks Cove	Eleva	ation: 1	1.75		26-32 Pirr	ama Road	Pyrmon	rer Level Suite 121 t 2009 (02) 9552 4399
Location:	Cook	s Cove - Area A		1	Enviror	nment	tal Lo	g:	Α	LG206
DRILLING	INFO.	LITHO	LOGY		SAMPLI	ING INF				
Depth Method	Water	Symbol Desc	ription	Sam	ple ID	Туре	0 250 HII	PID (pp)	n) 09/	WELL DETAIL
0 	×	dark brown, dry FILL: Sand, yelld dense, moist, gra silt lenses FILL: Silty clay, or moist FILL: Sandy silty and wet at 1.4m. 1.9m FILL: Silty clay, or moist SAND: Sand, pa grained, dense, fill SILTY SAND: Si clay, dark brown	bw, fine grained, ading to pale grey with dark brown, soft and r clay, dark brown, soft . Becoming grey at dark grey, firm and							
4 	l:	Macquarie Dr Mac200 nm): 75	illing	0	Date Com Date Com Logged/c	nplete	d:	15		

Pro	ject ID:	CES	050706	-BCC	Eastin	ig:	329456.7	55				
Pro	ject:	ESA			Northi	ing:	6243292	.819				NTIS TS
Clie	ent:	Boyd	Cooks	Cove	Elevat	ion:	1.15		26-32 Pirr	ama Road	I Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A			Enviro	nmen	tal Lo	g:	Α	MW201
DI	RILLING	INFO.		LITHOLOGY			SAMPL	ING IN	FORMA			WELL DETAIL
Depth	Method	Water	Symbol	Description		Sa	mple ID	Туре	0 250 DII	PID (pp	m) 120	
	Auger Solid Flight	₹		FILL: Grass over silty sand topso dark brown, moist with roots FILL: Sand, pale brown, fine grai moderately dense, moist with gra FILL: Silty clayey sand, brown, fine grained, moist and very dense FILL: Sand, pale grey, fine to me grained, loose and moist FILL: Silty sand, dark brown, fine grained, trace clay, dense and m SAND: Sand, pale grey, fine to medium grained, moist with silt le EOH at 2.8mBGL (targeted de	ned, avels ne edium enses	12050	8-257-KW 8-260-KW 8-259-KW 8-258-KW	Push Tube Push Tube Push Tube			<u>12</u>	
	o Drill Company		١	Macquarie Drilling			Date Cor	nmen	ced:	12/05/2008		
	II Model			Mac200			Date Cor	-			/05/2	
Hol	Hole Diamete		nm): 7	75	Logged/checked by: Jenkins/Weir							
											Sh	neet: 1 of 1

Г

Project	t ID:	CES	50706	-BCC Eas	ting:	329693.1	46)		SULTING
Project	t:	ESA		Nor	thing:	6243513.	796	З	₹	1	EAR SCIE	TH NTISTS
Client:	1	Boyd	Cooks	Cove Elev	vation:	1.37		26-32	2 Pirran	na Road	Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Locatio	on:	Cook	s Cove	- Area A		Enviro	nmen	tal	Log	:	Α	MW202
DRILL	LING I	NFO.		LITHOLOGY		SAMPL	ING IN					WELL DETAIL
Depth Me	thod	Water	Symbol	Description	s	ample ID	Туре	0	520 JU-	D (pp)	n) ೧೯/	
		×		FILL: Grass over silty sand topsoil, dark brown, fine grained, loose with roots FILL: Silty sand, pale brown, fine grained, dense, moist with sandstone gravels, tiles and no odour FILL: Silty clayey sand, brown/orange, moist, dense with no odour SAND: Sand, dark grey grading to pale grey with depth, fine to medium grained, ,oist and dense with trace silt. Saturated from 1.5-1.8m. H2S odour EOH at 2.8mBGL (targeted depth)	0705	08-65-KW	Push Tube Push Tube					
5												
				Macquarie Drilling		Date Con						2008
		odel: Mac200 iameter (mm): 75			Date Completed: Logged/checked by			oy:	07/05/2008 /: Jenkins/Weir Sheet: 1 of 1			

Pro	ject ID:	CES	050706	-BCC Easti	ing:	329961.7	34					SULTING
Pro	ject:	ESA		North	hing:	6243611.	832	З	₹	1	AR	TH NTISTS
Clie	ent:	Boyd	Cooks	Cove Eleva	ation:	1.97		26-3	2 Pirran	na Road	Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Enviror	nmen	tal	Log	:	Α	MW203
D	RILLING	NFO.		LITHOLOGY		SAMPL	ING IN				-	WELL DETAIL
Depth	Method	Water	Symbol	Description	Sa	mple ID	Туре	0	520 FID	D (ppr		
	Auger Solid Flight	Υ.		 FILL: Grass over silty sand topsoil, dark brown, loose and dry with rootlets FILL: Sand, dark brown, fine grained, dry with crushed sandstone fill, course grained, yellow and dry FILL: Ash fill, black gravels with sand, dark grey, fine grained and dry FILL: Sand, brown, trace clay, fine to medium grained, loose and dry FILL: Sand, brown, trace clay, fine to medium grained, moist to wet at 1.4m. Shells and H2S odour SAND: Sand, pale grey with trace silt and clay, wet with shells and H2S odour SILTY CLAY: Silty clay, dark grey, soft, wet with H2S odour SILTY SAND: Silty clayey sand, dark brown, fine to medium grained, soft and wet with shells EOH at 2.8mBGL (targeted depth) 	090508	8-188-KW 8-189-KW 8-190-KW	Push Tube Push Tube					
Dri	ll Comp	any:	Ν	Macquarie Drilling		Date Com	nmen	ced	:	09/	05/2	2008
	Drill Model:			Mac200		Date Com				09/05/2008 09/05/2008		2008
Ho	Hole Diame		nm): 7	75		Logged/c	heck	ed k	oy:	Jenkins/Weir		s/Weir
											Sł	neet: 1 of 1

Pro	ject ID:	CES	050706	-BCC Eas	ting:	329812.0	26				
Pro	ject:	ESA		Nor	thing:	6243339.	925	-7	<u> </u>		NTIS TS
Clie	ent:	Boyd	Cooks	Cove Elev	vation:	1.21		26-32 Pirr	ama Road	Pyrmon	er Level Suite 121 t 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove	- Area A		Enviro	nmen	tal Lo	g:	Α	MW204
D	RILLING	INFO.		LITHOLOGY		SAMPL	ING INI				
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре	/DIF 520	PID (pp)	m) 097	WELL DETAIL
	 Auger Solid Flight — 			 FILL: Grass over silty sand top soil, dark brown, fine grained, loose, dry to moist with roots FILL: Sand, yellow, fine to medium grained, loose grading to dense with depth, dry to moist with depth and shells FILL: Silty clay, brown, soft and moist FILL: Silty sand, dark grey/black, rootlets, fine grained and moist FILL: Sand, pale grey, fine to medium grained, moderately dense, moist with silt lenses SILTY SAND: Silty clayey sand, brown/grey, wet from 1.4-2.4m SAND: Sand, grey, fine to medium grained, dense and wet EOH at 2.8mBGL (targeted depth))8-119-KW)8-119-KW)8-120-KW	Push Tube Push Tube			<u><u></u></u>	
Dri	Drill Company Drill Model:		Γ	Macquarie Drilling Mac200 75		Date Con Date Con	nplete	ed:	09	/05/2 /05/2	2008
	Hole Diameter				Logged/checked by: J			001	Jenkins/Weir Sheet: 1 of 1		

Pro	ject ID:	CES	050706	-BCC Ea	asting:	329962.6	33						
Pro	ject:	ESA		N	orthing:	6243424.	415			J S		NTISTS	
Clie	ent:	Boyd	Cooks	Cove El	levation:	0.78		26-32 F	Pirrama	Road Py	/rmont	er Level Suite 121 2009 02) 9552 4399	
Loc	ation:	Cook	s Cove	- Area A		Enviror	nment	tal L	og:		A	MW205	
DI	RILLING	INFO.		LITHOLOGY		SAMPL	ing inf					WELL DETAIL	
Depth	Method	Water	Symbol	Description	Sa	imple ID	Туре			2200 (ppm) ()		
	Auger Solid Flight	Y		 FILL: Grass over silty sand top soil, dark brown, firm, moist with rootlets FILL: Sand, yellow, fine to medium grained, loose to moderate density and moist FILL: Sand, pale grey, fine to mediu grained, loose and moist FILL: Silty clay, brown, firm and moist FILL: Silty sand, brown grading to grey, fine to medium grained, dense and moist FILL: Silty clayey sand, saturated free 1.4 to 2.0m. Brown and stiff SAND: Sand, pale grey, fine grained dense and wet with shells. Refusal a 2.2mBGL on sandstone EOH at 2.2mBGL (refusal on sandstone bedrock) 	s 08050 um 08050 ist s e om d, at	8-155-KW 8-156-KW 8-157-KW	Push Tube Push Tube						
	5 Drill Company: Drill Model:			ny: Macquarie Drilling Mac200			Date Commenced: Date Completed:				08/05/2008 08/05/2008		
	Hole Diameter					Logged/c	-		/ :			/Weir	
	Hole Diameter		-								Sh	eet: 1 of 1	

Project	D: CES	050706-BCC	East	ing: 329965.4	24			
Project:	ESA		Nort	hing: 6243103.		EARTH SCIENTISTS		
Client:	Boyc	d Cooks Cove	Eleva	ation: 1.80	26-32 Pirrama	harf 19-21, Lower Level Suite 121 a Road Pyrmont 2009 9 2200 FAX: (02) 9552 4399		
Locatio	n: Cool	ks Cove - Area A		Enviro	nmental Log:	AMW206		
DRILLII	IG INFO.	LITI	HOLOGY	SAMPL	ING INFORMATIO			
Depth Meth	od Water	Symbol De	escription	Sample ID		O (ppm) WELL DETAIL 0 0 000 00000000000000000000000000000		
0 0 1 1 - - - - - - - - - - - - -		FILL: Grass of dark brown, of dark brown, of FILL: Sand, y dense, moist, silt lenses FILL: Silty clamoist SAND: Sand, grained, dense SILTY SAND Clay, dark bro	over silty sand topsoil,	150508-361-KW 150508-360-KW 150508-362-KW	Push Tube Push Tube			
5 Drill Co Drill Mo Hole Dia		Macquarie Mac200 mm): 75	Drilling	Date Cor	nmenced: npleted: checked by:	15/05/2008 15/05/2008 Jenkins/Weir Sheet: 1 of 1		

Г

Project ID:	CES	050706-BCC	Easting:	330009.1	73			
Project:	ESA		Northing:	6243281.		SCIE	NTIS TS	
Client:	Boyd	Cooks Cove	Elevation:	1.71	26-32 Piri	y Wharf 19-21, Lov ama Road Pyrmon 3569 2200 FAX:	ver Level Suite 121 t 2009 (02) 9552 4399	
Location:	Cook	s Cove - Area A		Enviror	nmental Lo	g: A	MW207	
DRILLING	NFO.	LITHOLOGY		SAMPL	ING INFORMA			
Depth Method	Water	Symbol Description	S	ample ID	/FID ح FID ح FID ح FID ح Type	PID (ppm)	WELL DETAIL	
0 	T	FILL: Silty sand top soil, br Image: Silter Silty sand, silt solt,	rown, dry, 0.2m 12050 ium grained, ark ey. Slightly ghout fill. sand, pale rn, moist s at 1.4- 12050 own, wet, n and wet, wet, fine to s with H2S soft and wet	08-218-KW 08-219-KW 08-220-KW 08-221-KW 08-221-KW	Push Tube Push Tube Push Tube			
4 5 Drill Comp Drill Model Hole Diam	:	Macquarie Drilling Mac200 nm): 75		Date Con	nmenced: npleted: checked by:		2008	

Pro	ect ID: CES050706-BCC Easting: 6243578.389		.389										
Pro	ject:	Cook	s Cove	•	Northin	ng:	329982.6	604		₹	- C		INTIS TS
Clie	ent:	Boyd	Cook (Cove	Elevati	on:			26-32	Pirram	a Road	Pyrmor	ver Level Suite 121 it 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove				Enviro	nmen	tal L	_og	:	B	BH401
DF	RILLING I	NFO.		LITHOLOGY			SAMPL	ING IN					WELL DETAIL
Depth	Method	Water	Symbol	Description		Sa	mple ID	Туре			200 200	n) ne/	
0				ASPHALT: Bitumen surface FILL: Sand, medium grained, white/brown, dry and odourless	2	280408	8-01-KW	Push Tube					
- - - - - - - - - - - - - - -	sh			FILL: Crushed red brick, hard, d FILL: Sand, white/pale brown, lo possible thin peat with shells gra to dark brown/grey. Moist at 1.2	oose, ading ?m 2		8-02-KW 8-03-KW	Push Tube					
	Direct Push			SANDY SILT: Sandy clay silt, d grey, organics, some shells, der and wet	nse	280408	8-04-KW	Push Tube	•				
	~			SAND: Sand, white/light grey, s content, some dark grey silt lens (potenially peat), wet and dense	ses								
						_	_		_	_	_	_	
	ll Comp	-	٢	Macquarie Drilling			Date Cor						2008
	II Model		`				Date Cor	-					2008
Hol	Hole Diameter (mm):				Logged/checked by:			y:	<i>r</i> : Jenkins/Weir Sheet: 1 of 1				
												Sr	

Pro	ject ID:	CESC)50706 [.]	-BCC East	ing:	6243477	.126					
Pro	ject:	Cook	s Cove	Nort	hing:	330007.7	791	Ξ	₹	1	EAR SCIE	INTISTS
Clie	ent:	Boyd	Cook C	Cove Elev	ation:			26-32	2 Pirra	ma Roa	d Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove			Enviro	nmen	tal	Log	J:	В	BH402
DI	RILLING I	NFO.		LITHOLOGY		SAMPL	ING IN					
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре	•	550 JUI	1 D (pt	750 m	WELL DETAIL
	Direct Push			FILL: Grass over sandy clay topsoil, brown, roots, dry and loose FILL: Clayey sand, orange/brown, ash, sandstone fragments (pink/white) FILL: Gravelly sand fill, brown, loose, dry to moist, ash (black) with sandstone fragments FILL: Sand, light to dark brown, moderately dense, fine to medium grained, coal/ash (small air bubbles) at 0.8-0.9m. Dry to moist FILL: Sand, dark brown, organic/shell content. Very dense, fine grained with sandstone FILL: Silty sand, trace clay, black/dark brown, shells with organic odour. Very dense, fine grained and moist FILL: Fractured sandstone, white and dry FILL: Sand, brown, loose, fine to medium grained with shells FILL: Sand, brown, loose, fine to medium grained with shells	28040	08-05-KW 08-06-KW 08-07-KW 08-08-KW	Push Tube Push Tube Push Tube					
_				and organic odour. Refusal on sandstone fill								
_						_				-		
	II Comp	-	Ν	<i>l</i> acquarie Drilling		Date Cor			:		3/04/2 2/04/2	
	Drill Model: Hole Diameter (nm).			Date Cor Logged/	-		·v-	28/04/2008 : Jenkins/Weir		
		(11						-	· y ·	00		neet: 1 of 1

Pro	ject ID:	CES	050706	-BCC Ea	asting:	6243347.	165				SULTING
Pro	ject:	Cook	s Cove	Να	orthing:	330025.0	68			EAR SCIE	TH NTISTS
Clie	nt:	Boyd	Cook (Cove El	evation:			26-32	Pirrama	Road Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove			Enviror	nmen	tal L	.og:	В	BH403
DF	RILLING I	NFO.		LITHOLOGY		SAMPL	ING IN				
Depth	Method	Water	Symbol	Description	Sa	mple ID	Туре		2500 500	750 (mdd)	WELL DETAIL
	Direct Push			FILL: Grass over silty sand topsoil, brown with rootlets FILL: Sand, yellow/orange, trace clar fine grained, dry to moist gravels, dense FILL: Becoming dark brown, shells a 0.7m SAND: Sand, light grey, moist to well fine to medium grained, loose SAND: Becoming dark grey, silty clar lenses, organic odour SILTY SAND: Silty clay sand, dark grey, oganic odour and inclusions, w at 2.3m	y, at 28040 t, y 28040 yet 28040	8-10-KW` 8-11-KW 8-14-KW 8-13-KW 8-12-KW	Push Tube Push Tube Push Tube Push Tube				
	\downarrow			grained, loose and wet							
D -''			ĸ	Acoquaria Drilling		Deta Or		!		20/04/0	2008
	II Comp II Model	-	Ν	Acquarie Drilling		Date Con Date Con				28/04/2 28/04/2	
	e Diam		nm):				-			Jenkins	
					Logged/checked by				Sheet: 1 of 1		

Project ID: CES050706-BCC Eas		Easting: 6243231.781										
Pro	ject:	Cook	s Cove	North	hing:	330048.3	383	З	₹			INTISTS
Clie	nt:	Boyd	Cook C	Cove Eleva	ation:			26-3	2 Pirrar	na Road	Pyrmor	wer Level Suite 121 ht 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove			Enviro	nmen	tal	Log	:	B	BH404
DF		NFO.		LITHOLOGY		SAMPL	ING IN					
Depth	Method	Water	Symbol	Description	Sai	mple ID	Туре	0	FID/P	D (pp	m)	WELL DETAIL
0				FILL: Grass over sand, light grey, fine to medium grained, moist with shells, rootlets and gravels FILL: Dark brown, silty clayey sand, fine grained and moist FILL: Clay, light grey with red ironstone gravels	280408	3-15-KW	Push Tube					
- - - 1-	- - - 1- -		grained, gravels, organic odou and dense	FILL: Sandstone, white/orange,	280408	3-16-KW	Push Tube	•				
-	- 1	SAND: Sand, dry to moist, o at 1.3m	SAND: Sand, grey, fine grained, loose, dry to moist, organic black peat lense at 1.3m	_								
- - - 2-			SAND: Becoming grey/orange fine to medium grained	280408	3-17-KW	Push Tube	•					
				CLAY: Clay, dark brown, moist to wet, plastic	-							
-	\checkmark			SAND: Sand, grey, fine grained, moderately dense and moist PEAT: Black peat silty lense with								
				brown sand, medium grained, loose End of borehole.								
3												
ייים	10000	00.0	R /	lacquarie Drilling		Data Car		ام م		20	/0.4./*	2008
	l Comp	-	IV	lacquarie Drilling	Date Commenced: Date Completed:		•	28/04/2008 28/04/2008				
	Drill Model: Hole Diameter (m						-		•v•			2008 s/Weir
					Logged/checl			hecked by:				neet: 1 of 1

Pro	ject ID:	CES)50706 [.]	-BCC Easti	ing:	6243245.	671				
Pro	ject:	Cook	s Cove	North	ning:	329381.5	99			EAR SCIE	NTIS TS
Clie	ent:	Boyd	Cook C	Cove Eleva	ation:			26-32 F	Pirrama R	load Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove			Enviror	men	tal L	og:	В	BH405
DF	RILLING I	NFO.		LITHOLOGY		SAMPLI	ING INF				WELL DETAIL
Depth	Method	Water	Symbol	Description	Sa	mple ID	Туре) DIP/D	ppm) 220	WELL DETAIL
	Direct Push			FILL: Grass over fill comprising clayey sand, orange/brown, medium to coarse grained, dry to moist, gravels and rootlets		8-48-KW 8-49-KW	Hand Auger				
Dril	ll Comp	anv [.]	Ν	<i>N</i> acquarie Drilling		Date Com	menr	ced.		28/04/2	2008
	ll Model					Date Com				28/04/2	
Hol	e Diam	eter (n	nm):			Logged/c			/: .	Jenkins	s/Weir
										Sł	neet: 1 of 1

Project I	D: CES	050706	-BCC Eas	ting:	6243252	.022					SULTING
Project:	Cool	ks Cove	Νοι	thing:	329429.6	37		₹		EAR SCIE	NTIS TS
Client:	Boyc	I Cook (Cove Ele	vation:			26-3	2 Pirra	ma Roa	d Pyrmor	ver Level Suite 121 t 2009 (02) 9552 4399
Locatior	n: Cool	ks Cove			Enviro	nmen	tal	Log	J:	В	BH406
DRILLIN	IG INFO.		LITHOLOGY		SAMPL	ING IN					
Depth Metho	od Water	Symbol	Description	Sa	ample ID	Туре	0	FID/P	200 DI	750 u	WELL DETAIL
0 - - - - - - - - - - - - -			FILL: Grass over silty sand topsoil. Medium grained, light brown, moist, loose, some gravels FILL: Sandy silt, dark brown, fine to medium grained FILL: Silty sand, darker brown, moist, dense medium grained SAND: Sand, pale grey, medium grained, moist, moderately dense, brown peat lenses throughout, wet at 1.5m		08-46-KW	Push Tube					
Drill Company: Macquarie Drilling Drill Model: Hole Diameter (mm):			Aacquarie Drilling		Date Cor Date Cor Logged/o	nplete	ed:		29		

Project ID: CES050706-BCC Easting:		asting: 6243213.42										
Project:	Cook	s Cove		North	ning:	329440.5	47		₹			INTISTS
Client:	Boyd	Cook C	Cove	Eleva	tion:			26-32	Pirra	ma Roa	ad Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Location:	Cook	s Cove				Enviror	nmen	tal I	_00	J:	B	BH407
DRILLING I	NFO.		LITHOLOGY			SAMPL	ING IN					
Depth Method	Water	Symbol	Description		Sa	ample ID	Туре	• F	550 D	1D (p 200	pm) ¹²⁰	WELL DETAIL
0 - - - - - - - - - - - - -			FILL: Grass over silty sand top s fine grained, dark brown, moist v gravels FILL: Clayey sand, fine to mediu grained, light brown/orange with crushed white sandstone and ironstone gravels, moist and der FILL: Silty clayey sand, dark bro fine to medium grained, very den minor gravels, bone, moist with organic odour SILTY SAND: Silty sand, dark gr fine grained, very dense, moist t Wet at 1.6m.	with um nse wm, nse, rey,	29040	18-43-KW 18-44-KW 18-44-KW	Push Tube Push Tube					
Drill Comp Drill Model Hole Diamo	:		Iacquarie Drilling			Date Con Date Con Logged/c	nplete	ed:		29		

Project ID	: CES	050706-I	BCC Ea	sting:	6243233.	644		1		SULTING
Project:	Cook	ks Cove	No	orthing:	329503.1	88			EAR SCIE	NTIS TS
Client:	Boyd	I Cook C	ove Ele	evation:			26-32	Pirrama	Road Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Location:	Cook	ks Cove			Enviror	hmen	tal L	.og:	В	BH408
DRILLING	INFO.		LITHOLOGY		SAMPL	ING INI				WELL DETAIL
Depth Method	Water	Symbol	Description	Sa	mple ID	Туре		2200 2500	(ppm)	WELL DETAIL
Direct Push			FILL: Grass over silty sand top soil, grey/brown, roots, moist, medium grained and loose FILL: Silty sand, dark grey/brown, dense, moist, fine grained with grave FILL: Sandy silt, dark brown, moderately dense and moist SAND: Sand, grey, medium grained, moderately dense, moist, wet at 1.4r Organic odour SAND: Becoming dark brown SAND: Becoming dark brown	els , n. 29040	8-50-KW 8-52-KW 8-51-KW	Push Tube Push Tube Push Tube				
	nanve	Γ.4	lacquarie Drilling		Date Con	mon	-od-		29/04/2	2008
Drill Com Drill Mode		IVI	acquare Drilling		Date Con				29/04/2	
Hole Dian		nm):			Logged/c			y:	Jenkins	
									Sh	eet: 1 of 1

Proj	ect ID:	CES	050706	-BCC Eas	sting:	624318 <i>′</i>	1.502					SULTING
Proj	ect:	Cook	s Cove	No	rthing:	329480.	958	R	₹		EAR SCIE	NTIS TS
Clie	nt:	Boyd	Cook (Cove Ele	vation:			26-3	2 Pirra	ma Road	I Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Loca	ation:	Cook	s Cove			Enviro	onmen	tal	Log	J:	В	BH409
DR		NFO.		LITHOLOGY		SAMP	LING IN					
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре	0	FID/P 520	ID (pp	1 20 m	WELL DETAIL
	Direct Push			FILL: Grass over silty sand topsoil, dark brown, rootlets FILL: Sand, grey to brown, fine to medium grained, loose to moderately dense, moist, minor/trace gravels CLAYEY SAND: Dark brown, fine to medium grained, dense, moist SAND: Pale grey, medium grained, wet at 0.8m, moderately dense	29040)8-41-KW)8-40-KW)8-39-KW	Push Tube Push Tube Push Tube					
Drill	l Comp I Model e Diamo	:		<i>l</i> acquarie Drilling		Date Co Date Co Logged	mplete	ed:		29		2008 s/Weir
											Sh	neet: 1 of 1

Proj	ject ID:	CES	050706	-BCC	Easti	ng:	6243199	.687					
Proj	ject:	Cook	s Cove		North	ning:	329560.8	807	4	₹		EAR SCIE	INTIS TS
Clie	nt:	Boyd	Cook (Cove	Eleva	tion:			26-3	2 Pirra	ma Roa	d Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove				Enviro	nmen	tal	Log	j :	B	BH410
DF	RILLING	INFO.		LITHOLOGY			SAMPL	ING IN					WELL DETAIL
Depth	Method	Water	Symbol	Description		Sa	ample ID	Туре	0	FID/P	1 D (pi	220 mo	
0				FILL: Grass over sandy topsoil, brown/orange/yellow, fine graine minor clay. Ash at 0.1m. Red ironstone gravels at 0.5m, black charcoal fragments throughout		28040	18-25-KW	Push Tube					
_				FILL: Sand, dark brown, fine gra with glass, bone, moist and loos		28040	08-26-KW	Push Tube					
1-	-	dense, moist,	SAND: Grey, fine grained, mode dense, moist, shells throughout										
	 Direct Push 			PEAT: Black decaying organic f	ibres								
-				CLAY: Clay, black, wet at 1.6m, plastic, organic odour, roots, she with bacterial sheen	ells	28040	98-27-KW	Push Tube					
2				SAND: Sand, fine to medium gragrey with shells throughout , we		28040	18-28-KW	Push	•				
	\downarrow												
	l Comp	-	N	<i>N</i> acquarie Drilling			Date Cor			•		9/04/2	
	I Model						Date Cor	-				9/04/2	
Hol	e Diam	eter (n	nm):				Logged/	check	ed k	by:	Je		s/Weir
												SI	heet: 1 of 1

Project ID:	CES	050706	-BCC Eas	ting:	6243134	.049				
Project:	Cook	Northing:329478.399vd Cook CoveElevation:					-			IN TIS TS
Client:	Boyd	Cook (Cove Elev	vation:			26-32 I	Pirrama F	Road Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Location:	Cook	s Cove			Enviro	nmen	tal L	og:	B	BH411
DRILLING	NFO.		LITHOLOGY		SAMPL	ING IN				
Depth Method	Water	Symbol	Description	Sa	mple ID	Туре		DIP/D		WELL DETAIL
Direct Pursh			FILL: Grass over silty sand topsoil, fine to medium grained, grey/brown, moist with rootlets FILL: Clay, grey/red/orange, stiff and dry with trace sand, gravels, ironstone gravels, sandstone and shale fragments with ash at 0.8-0.9m SAND: Silty sand, dark brown/grey with sandstone gravels, loose and dry SILT: Silt, black to dark brown, loose, organic odour, moist SILT: Sand, medium grained, grey,	29040	8-36-KW 8-37-KW	Push Tube Push Tube		20 20	120	
			moist and dense	29040	8-38-KW	Push Tube				
Drill Comp Drill Model Hole Diam	:		Macquarie Drilling		Date Cor Date Cor Logged/o	nplete	ed:		29/04/2 29/04/2 Jenkin	2008
		···· · /·			33**/		J	, -		neet: 1 of 1

Project ID:	CES	050706-BCC	Easting:	6243161.	139			SULTING
Project:	Cook	Boyd Cook Cove Elevation: 26-32				₹	SCIE	TH INTISTS
Client:	Boyd	Cook Cove	Elevation:		2	6-32 Pirrama	Road Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Location:	Cook	s Cove		Enviror	nmenta	l Log:	В	BH412
DRILLING I	NFO.	LITHOLOGY		SAMPL	ING INFO			
Depth Method	Water	Symbol Description	Sa	ample ID	Туре с	250 EID/PID		WELL DETAIL
		FILL: Grass overlying sandy topsoil, brown, rootlets, mois charcoal pieces FILL: Sand, dark brown/grey grained, loose, trace clay, moderated and ash inclusions, ash odout FILL: Silty sandy clay, black and ash inclusions, ash odout SAND: Sand, grey, with trace clay, moderately dense, mois grained	st with r, fine oist 28040 with glass ur 28040 e silt and st and fine	08-21-KW	Push Tube Push Tube Push Tube			
Drill Comp Drill Model Hole Diame	:	Macquarie Drilling	I	Date Con Date Con Logged/c	npleted	:	29/04/2 29/04/2 Jenkins St	2008

Project ID:	CES	050706-	BCC Easti	ng: 6243127	.577				SULTING
Project:	Cook	s Cove	North	ning: 329632.1	03	4		EAR SCIE	IH NTISTS
Client:	Boyd	Cook C	Cove Eleva	tion:		26-32 F	Pirrama Ro	ad Pyrmor	ver Level Suite 121 t 2009 (02) 9552 4399
Location:	Cook	s Cove		Enviro	nmen	tal L	og:	В	BH413
	NFO.		LITHOLOGY	SAMPL	ING IN				WELL DETAIL
Depth Method	Water	Symbol	Description	Sample ID	Туре		D/PID (p	220 mq	
0 			FILL: Grass over sandy topsoil, brown, rootlets, dry and shells FILL: Sand, yellow, medium grained, loose, dry to moist, some shells, silty peat lense at 0.7m SAND: Sand, grey with dark brown lenses, shells, organics, moist to wet CLAYEY SILT: Clayey silt, dark brown, moist, plastic with organic odour SANDSTONE: White, hard sandtsone bedrock. Refusal at 1.6m	280408-18-KW 280408-20-KW 280408-19-KW	Push Tube				
Drill Comp	any:	N	Acquarie Drilling	Date Cor	nmen	ced:	2	9/04/2	2008
Drill Model	:			Date Cor	nplete	ed:	2	9/04/2	2008
Hole Diam	eter (n	nm):		Logged/	check	ed by	/: J		s/Weir
								Sł	neet: 1 of 1

Project ID:	CES	050706-BCC	Easting:	6243132.	138					
Project:	Cook	as Cove	Northing: 329689.226 ve Elevation:					- 1 - I	ar' Cie	NTIS TS
Client:	Boyd	Cook Cove	Elevation:			26-32	2 Pirrama	a Road P	yrmon	er Level Suite 121 : 2009 02) 9552 4399
Location:	Cook	s Cove		Enviror	nmen	tal I	Log:	1	В	BH414
DRILLING	INFO.	LITHOLOGY		SAMPL	ING INF					
Depth Method	Water	Symbol Description	Sa	ample ID	Туре	F 0		2000 (ppm) 220 220		WELL DETAIL
Depth Method	Water	Symbol Description FILL: Grass over silty sand roots and moist FILL: Sand, brown, trace clargrained, moist with some grained, moist with some grained, loose, shells, moist lenses, wet at 1.5m	topsoil, ay, fine ravels 02050 02050 02050	28-169-KW 28-168-KW 28-170-KW 28-170-KW	Push Tube Push Tube Push Tube		250	200		
		SAND: Sand, grey, fine to n grained, moderately dense, moist SILTY SAND: Silty sand, da fine grained, dense and mo SILTY CLAY: Silty clay, dar and moist SILT: Black silt, organic odd grained moist	shells and ark grey, ist ' 'k grey soft pur, fine							
						-		00/		
Drill Comp	-	Macquarie Drilling		Date Com						8008
Drill Mode Hole Diam		nm).		Date Com Logged/c	-					008 /Weir
	5.5i (ii	····· /·		9900/0		N	· .	0011		eet: 1 of 1

Project ID:	CES	050706-BCC	Easting:	6243127.	487				SULTING
Project:	Cook	s Cove	Northing:	330037.0	91	₹		EAR SCIE	NTIS TS
Client:	Boyd	Cook Cove	Elevation:		2	26-32 Pirra	ama Roa	d Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Location:	Cook	s Cove		Enviror	nmenta	al Log	g:	В	BH415
DRILLING II	NFO.	LITHOLOGY		SAMPL	ING INFO				
Depth Method	Water	Symbol Description	s	ample ID	Туре с		ID (p) 200	220 m	WELL DETAIL
0 - - - - - - - - - - - - -		FILL: Grass over silty sand to trace clay and gravels, fine grand moist FILL: Clayey sand, orange/brmoist, medium grained, mode dense with crushed sandston SILTY SAND: Silty sand, dark medium grained, moderately moist with organic odour SILTY SAND: Silty sand, dark medium grained, moderately with H2S odour at 2.6m	rained 3004 rown/grey, erately ie 8 k grey, 3004 dense, 3004 k grey, dense, 4 k grey, dense, 4 k grey, dense, 4	08-79-KW 08-79-KW	Push Tube Push Tube				
Drill Compa Drill Model Hole Diame	:	Macquarie Drilling		Date Con Date Con Logged/c	npleted	:	30		

Project ID:	CESC)50706 [.]	-BCC Easti	ing:	6243103.	.394				ONSULTING
Project:	Cook	s Cove	North	hing:	329558.4	72				ARTH CIENTIS TS
Client:	Boyd	Cook C	Cove Eleva	ation:			26-32	Pirrama	a Road P	21, Lower Level Suite 121 Pyrmont 2009 FAX: (02) 9552 4399
Location:	Cook	s Cove			Enviro	nmen	tal L	.og:	:	BBH417
	NFO.		LITHOLOGY		SAMPL	ING IN				
Depth Method	Water	Symbol	Description	Sa	mple ID	Туре			200 (ppm) 220 2	
0			FILL: Grass over silty clay topsoil, fine grained and odourless FILL: Clayey silty sand, grey/brown with ash and glass fragments, moist and dense FILL: Clayey sand, grey/orange, moist and dense FILL: Clayey sand, grey/orange, moist and dense FILL: Becoming dark grey FILL: Black silt, fibrous root mass, organic odour, gravels (possible ash), moist to wet SAND: Sand, grey, fine to medium grained, moist to wet SILTY SAND: Silty sand, dark grey, moist to wet, moderately dense, organic odour. Shells and rootlets from 2.3m	29040	8-29-KW 8-30-KW 8-31-KW	Push Tube Push Tube		<u>52</u>		
Drill Compa Drill Model: Hole Diame	:		Macquarie Drilling	<u> </u>	Date Con Date Con Logged/o	nplete	d:	y:	29/0	04/2008 04/2008 kins/Weir Sheet: 1 of 1

Project ID:	CES)50706-BCC		Easting:	6243065	.891)	SULTING
Project:	Cook	s Cove		Northing:	329619.8	308	3	₹		EAR SCIE	INTIS TS
Client:	Boyd	Cook Cove		Elevation	:		26-32	2 Pirra	ma Roa	ad Pyrmor	ver Level Suite 121 nt 2009 (02) 9552 4399
Location:	Cook	s Cove			Enviro	nmen	tal	Log	g:	B	BH418
DRILLING	NFO.		LITHOLOGY		SAMPL	LING IN					
Depth Method	Water	Symbol	Description	5	Sample ID	Туре		FID/F 520	q) DI 200	750 ud	WELL DETAIL
0 - - - - - - - - - - - - -		FILL: Sat moderate FILL: Sat moderate FILL: Cla dense. L 0.8 to 0.5 FILL: Sitt grained, SAND: S grained a SILTY Sit	ass over silty sand top moist, roots and loose nd, pale grey, fine gra ally dense, moist with s ally dense, moist with s ally dense, moist with s ally dense and solar y sand, dark brown, fi dense and moist and, pale grey, wet, n and dense	e 2904 ined, shells soft, 2904 ilt from nedium 2904 brown,	108-66KW	Push Tube					
Drill Comp Drill Model Hole Diam	:	grained,	AND: Silty sand, grey, dense, wet with shells		Date Cor Date Cor Logged/	mplete	ed:		2		

Pro	ject ID:	CES	050706	-BCC Easti	ng:	6243081	.721				· · · · ·	SULTING
Pro	ject:	Cook	s Cove	North	ning:	329679.2	285	Ξ	₹		EAR SCIE	ITH INTISTS
Clie	nt:	Boyd	Cook (Cove Eleva	ation:			26-3	2 Pirra	ama Ro	oad Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove			Enviro	nmen	tal	Lo	g:	B	BH419
DF		INFO.		LITHOLOGY		SAMP	LING IN	FOR	MA	ΓΙΟΝ	I	
Depth	Method	Water	Symbol	Description	Sa	mple ID	Туре	0	FID/F	1) Ol 200	250 md	WELL DETAIL
0					1							
_	$\left \right $			FILL: Grass oversilty sand topsoil, brown, loose, fine grained, rootlets and moist								
_				FILL: Sand, brown/grey, fine to medium grained, loose, moist with gravels coal and sandstone	29040	8-62-KW	Push Tube					
_				FILL: Silt, dark brown, moist with gravels								
_				FILL: Clay, grey/orange, moist, stiff with gravels	29040	8-63-KW	Push Tube					
				FILL: Silty sand, black, fine grained, moderately dense, moist with gravels								
-				FILL: Sand, pale grey, fine grained with trace clay, moist to wet with shells at 1.5m								
_	ect Push											
_	Direct F											
-				FILL: Sandy silt, brown/grey and wet	-							
_				FILL: Silty clay, dark brown, soft, wet and dense	-							
2				FILL: Fibrous black mass, silt, ash, rock, glass and wet	29040	8-64-KW	Push Tube					
-				FILL: Clayey silt, dark brown, soft, wet and dense								
_												
	\checkmark			SAND: Sand, grey with silt, shells, moist to wet and dense	29040	8-65-KW	Push Tube					
Dril	l Comp	anv:	N	Macquarie Drilling		Date Co	mmen	ced	:	2	29/04/2	2008
	I Model	-		, ,		Date Co					29/04/2	
Hol	e Diam	eter (n	nm):			Logged/	-		oy:	J	lenkin	s/Weir
											SI	neet: 1 of 1

Project ID:	CES	050706	-BCC Easti	ing:	6243090	.111					SULTING
Project:	Cook	s Cove	North	ning:	329732.2	258	Ξ	₹		EAR SCIE	INTISTS
Client:	Boyd	Cook (Cove Eleva	ation:			26-3	2 Pirra	ima Ro	ad Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Location:	Cook	s Cove			Enviro	nmen	tal	Log	g:	B	BH420
DRILLING	INFO.		LITHOLOGY		SAMPL	ING IN	FOR	MAT			
Depth Method	Water	Symbol	Description	Sa	Imple ID	Туре	0	FID/F 520	q) Ol q	750 md	WELL DETAIL
			FILL: Grass over silty sand top soil, dark brown, fine grained, loose, moist with roots FILL: Sand, yellow, fine grained to medium grained. Moderately dense, moist with shells	02050	8-165-KW	Push Tube					
-				02050	8-166-KW	Push Tube	•				
			FILL: Silty clay, dark brown. Fine grained sand, dense, moist with organic odour FILL: Sand. Pale grey, fine to medium grained, moist to wet, moderately dense with silt lenses. Wet at 1.6m								
- 2 -			FILL: Silty sand, minor clay, dark grey, fine grained, moist to wet FILL: Silty clay. Dark brown, fine grained, soft, moist to wet FILL: Silt. Black, sandy and moist FILL: Crushed sandstone, orange/white, clay content, moist (wet at 2.4m) and odourless								
			SILTY SAND: NOTE: End depth was null so start depth was used instead. Dark brown, clay content with organic odour.	02050	8-167-KW	Push Tube	-				
Drill Comp	any:	Ν	<i>l</i> acquarie Drilling		Date Cor	nmen	ced	:	0	2/05/2	2008
Drill Mode	l:				Date Cor	nplete	ed:		0	2/05/2	2008
Hole Diam	eter (n	n m): 7	75		Logged/	check	ed k	oy:	J		s/Weir neet: 1 of 1

Pro	ject ID:	CES	050706	-BCC East	ing:	6243083	.702					
Pro	ject:	Cook	s Cove	Nort	hing:	329934.9	986		₹		EAR SCIE	INTISTS
Clie	nt:	Boyd	Cook (Cove Elev	ation:			26-3	2 Pirra	ama Ro	ad Pyrmo	wer Level Suite 121 ht 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove			Enviro	nmen	tal	Log	g:	E	BH421
DF	RILLING	INFO.		LITHOLOGY		SAMPL	ING IN					
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре	0	FID/F 520	1) Ol 200	250 (mq	WELL DETAIL
0	\uparrow			FILL: Grass over sandy topsoil, brown, fine grained, loose, dry with rootlets	30040	105-KW	Push Tube					
-				FILL: Sand, pale grey, fine to medium grained, loose, dry with rootlets. Silty clay lenses at 0.3m, shells, moist and dense at 0.6m								
-					30040	8-104-KW	Push Tube					
1-	ect Push			FILL: Silty clay, dark brown, fine grained and dense	_							
-	Direc			FILL: Sand, pale grey, medium grained, moderately dense, shells and wet at 1.4m	_							
2-				SILTY CLAY: Silty clay, dark brown/grey, fine grained, soft, wet with H2S odour	_							
_				SILTY SAND: Silty sand, trace clay, dark grey, fine grained, moist with H2S odour								
_				SILTY CLAY: Silty clay, dark grey, soft, moist to wet								
				SAND: Sand, pale grey, medium grained, dense, wet with shells								
	\downarrow			SILTY CLAY: Silty clay, dark grey, soft, moist to wet with trace sand								
	I Comp	-	N	<i>l</i> acquarie Drilling		Date Cor Date Cor			•		30/04/2 30/04/2	
	e Diam		nm):			Logged/	-		by:			s/Weir
			-								S	neet: 1 of 1

Proj	ect ID:	CES	050706	-BCC Eas	sting:	6243065	.802					SULTING
Proj	ect:	Cook	s Cove	Nor	rthing:	329981.0	096	Ξ	₹		EAR SCIE	INTISTS
Clier	nt:	Boyd	Cook (Cove Ele	vation:			26-32	2 Pirra	ma Ro	ad Pyrmor	ver Level Suite 121 it 2009 (02) 9552 4399
Loca	ation:	Cook	s Cove			Enviro	nmen	tal	Loç	g:	B	BH422
DR		NFO.		LITHOLOGY		SAMPI	LING IN					
Depth	Method	Water	Symbol	Description	Si	ample ID	Туре	6 0	720	1) Ol 200	1 20 mq	WELL DETAIL
0												
_	\uparrow			FILL: Grass over silty sand topsoil, brown, moist with rootlets								
_				FILL: Sand, yellow, fine to medium grained, moderately dense with gravels from 0.2-0.4m	30040	08-112-KW	Push Tube	•				
- - - - 1- 1-				FILL: Sand, pale grey, fine to medium grained, moderately dense, moist and shells								
	Direct Push			FILL: Silty clay, dark grey, soft and moist to wet SAND: Sand, pale grey, fine to medium grained, moderately dense and moist								
2				SILTY CLAY: Silty clay, dark brown, soft and wet (saturated at 2.0-2.2m) and organic odour	30040	08-113-KW	Push Tube	-				
				SILTY SAND: Silty sand, fine to medium grained, brown with organic odour								
	↓ Comp	-	<u></u> .	Macquarie Drilling		Date Co Date Co					0/04/2 0/04/2	
Hole	e Diam	eter (n	nm):			Logged/	-		y:			s/Weir
											Sł	neet: 1 of 1

Project II	D: CES	050706-	BCC East	i ng: 624307	7.14				
Project:	Cook	ks Cove	Nort	hing: 330027	.905			EAR SCIE	INTISTS
Client:	Boyd	l Cook C	Cove Eleva	ation:		26-32 Piri	ama Roa	ad Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Location	: Cook	ks Cove		Enviro	onmen	tal Lo	g:	В	BH423
DRILLIN	g info.		LITHOLOGY	SAMF	PLING INI				
Depth Metho	d Water	Symbol	Description	Sample ID	Туре	0 550	PID (p	pm) 120	WELL DETAIL
Direct Push			FILL: Sand, grey to dark grey, medium grained, moderately dense and moist FILL: Sand, grey to dark grey, medium grained, moderately dense, moist, gravels and ash at 0.7-0.8m FILL: Sand, pale grey, silt layers, moist to wet at 1.3m FILL: Silty sand, dark grey, fine to medium grained, dense, wet with H2S odour. Shells at 2.2m SAND: Sand, pale grey, trace silts, medium grained, dense, moist and odourless	300408-81-KW 300408-82-KW 300408-82-KW 300408-83-KW	Push Tube Push Tube		20		
Drill Con	npany:	Ν	lacquarie Drilling	Date Co	ommene	ced:	3	0/04/2	2008
Drill Mod			-	Date Co	omplete	d:	3	0/04/2	2008
Hole Dia	meter (r	nm):		Logged	l/check	ed by:	Je	enkin	s/Weir
								Sł	neet: 1 of 1

Project ID:	CES)50706 [.]	-BCC	Easting	j :	6243018.	161					SULTING	
Project:	Cook	s Cove		Northin	g:	329618.6	35	-	₹		EAR SCIE	NTIS TS	
Client:	Boyd	Cook C	Cove	Elevatio	on:			26-32	2 Pirra	ma Roa	ad Pyrmor	ver Level Suite 121 t 2009 (02) 9552 4399	
Location:	Cook	s Cove				Enviror	nmen	tal	Log	j :	В	BH425	
DRILLING	INFO.		LITHOLOGY			SAMPLI	ING IN				-	WELL DETAIL	
Depth Method	Water	Symbol	Description		San	nple ID	Туре	•	550 UI	ID (p	pm) 120		
0 - - - - - - - - - - - - -	Image: state of the state		FILL: Sand, yellow, fine to mediu grained, loose, dry to moist, moderately dense with shells at 0 1.1m FILL: Clayey silt, black, moderate dense with organic odour	nd 2).8- >ly 2		-57-KW	Push Tube Push Tube						
Drill Com	anv:	N	Aacquarie Drilling		I	Date Com	men	ced		2	9/04/2	2008	
Drill Mode		N				Date Con				29/04/2008 29/04/2008			
Hole Diam		nm):				Logged/c			y:			s/Weir	
											Sł	neet: 1 of 1	

Pro	ject ID:	CES	050706	-BCC E	Easting:	6243029	.629					
Proj	ject:	Cook	s Cove	Ν	Northing	: 329677.0	034	R	₹	1	EAR SCIE	INTISTS
Clie	nt:	Boyd	Cook (Cove E	Elevatio	ı:		26-32	2 Pirram	na Road	d Pyrmoi	wer Level Suite 121 ht 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove			Enviro	nmen	tal	Log	:	B	BH426
DF	RILLING I	NFO.		LITHOLOGY		SAMPL	LING IN					
Depth	Method	Water	Symbol	Description		Sample ID	Туре	0		D (pp	150 m	WELL DETAIL
	Direct Push			FILL: Grass over silty sand topsoil, brown, medium grained, loose, dry moist FILL: Sand, yellow grading to pale grey with depth, dense and dry to moist FILL: Clayey silt, dark brown, soft. at 1.5m FILL: Silt, dark brown, soft with gla gravel and roots FILL: Silty sand with trace clay, dar grey, wet and dense SAND: Sand, pale grey, medium grained, dense, wet with shells	v to 290 290 Wet 1 NSS, 290)408-69-KW)408-70-KW	Push Tube Push Tube					
Dril	l Comp	anv:	Ν	Macquarie Drilling		Date Co	mmen	ced	•	29)/04/2	2008
	l Model	-				Date Co						2008
Hol	e Diamo	eter (n	nm):			Logged/	check	ed b	oy:	Je	enkin	s/Weir
											SI	neet: 1 of 1

Project ID:	CES	050706 [.]	-BCC Ea	sting:	6243015.	816				
Project:	Cook	s Cove	Νο	orthing:	329761.2	81	-			NTISTS
Client:	Boyd	Cook C	Cove Ele	evation:			26-32 Pir	rama Roa	d Pyrmon	er Level Suite 121 t 2009 (02) 9552 4399
Location:	Cook	s Cove			Enviror	hmen	tal Lo	g:	B	BH427
DRILLING	INFO.		LITHOLOGY		SAMPL	ING INI			-	WELL DETAIL
Depth Method	Water	Symbol	Description	Sa	ample ID	Туре	0 550 DIJ	PID (pi	220 (mc	WELL DETAIL
			FILL: Grass over silty sand topsoil, dark brown, fine grained, loose and moist FILL: Clayey sand, brown/orange with concrete rubble, gravels and shells. Some stiffer brown clay FILL: Sand, yellow, medium grained FILL: Sand, yellow, medium grained FILL: Orange sand lenses CLAYEY SILT: Clayey silt, dark brow stiff dense with shells		18-59-KW 18-60-KW 18-61-KW	Push Tube				
Drill Comp	-	->->- ->->- ->->- ->->-	<i>I</i> acquarie Drilling		Date Con Date Con)/04/2)/04/2	
Hole Diam	Hole Diameter (mm):			Logged/checked by: Jenkins/Weir					s/Weir	
									Sh	eet: 1 of 1

Project ID:	CES)50706·	-BCC Easti	ng:	6243055	.224					SULTING
Project:	Cook	s Cove	North	ning:	329789.8	82		₹		EAR SCIE	INTISTS
Client:	Boyd	Cook C	Cove Eleva	tion:			26-3	2 Pirra	ima Ro	ad Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Location:	Cook	s Cove			Enviro	nmen	tal	Log	g :	B	BH428
	NFO.		LITHOLOGY		SAMPL	ING IN	FOR	МАТ			
Depth Method	Water	Symbol	Description	Sa	mple ID	Туре		FID/F 520	q) Ol q	750 ud	WELL DETAIL
0 			FILL: Grass over silty sand topsoil, brown, loose, dry, fine grained with roots FILL: Silty sand, brown, fine grained moist with gravels and roots FILL: Sand, yellow/pale grey with orange mottles, shells and peat sections throughout FILL: Silty clay, dark grey, moist and soft FILL: Sand, grey, fine grained to medium grained, loose, wet with shells and peat layers FILL: Silty clay, dark grey, wet with organic odour FILL: Silty clay, dark grey, moist and soft		8-162-KW 8-163-KW	Push Tube					
			FILL: Silty sand, moist with gravels, glass and organic odour FILL: Silt clay, dark brown/black, soft with organic odour	01050	8-164-KW	Push Tube	-				
Drill Company: Macquarie Drilling Drill Model: Hole Diameter (mm):				Date Cor Date Cor Logged/o	nplete	ed:		0			

Proj	ject ID:	CES)50706·	-BCC East	ing:	6243040	.823								
Proj	ject:	Cook	s Cove	Nort	hing:	329870.1	154		₹	- I -					
Clie	nt:	Boyd	Cook C	Cove Elev	SAMPLING INFORMATION Sample ID Type o g g pil, dark 010508-152-KW Push Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Colspan="2" pil, dark 010508-152-KW Push Image: Colspan="2">Image: Colspan="2">Image: Colspan="2" pil, dark 010508-153-KW Push Image: Colspan="2">Image: Colspan="2" moist, Ash at Image: Colspan="2" Image: Colspan="2">Image: Colspan="2" attles, 3m 010508-153-KW Push Image: Colspan="2">Image: Colspan="2" and wet Image: Colspan="2">Image: Colspan="2" ass, s and 010508-155-KW Push Image: Colspan="2">Image: Colspan="2"			t 2009							
Loc	ation:	Cook	s Cove			Enviro	nmen	tal L	_og	:	В	BH429			
DF	RILLING	INFO.		LITHOLOGY		SAMPL	ING IN								
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре					WELL DETAIL			
0	I								1 :	1 :	 				
_				FILL: Grass over silty clay topsoil, dark brown, roots and gravels	01050	08-152-KW									
-				FILL: Crushed sandstone (white)	_										
_				FILL: Clayey sand, dark brown, moist, dense with gravels, silt lenses. Ash at 0.5m											
_				FILL: Clay, dark grey/brown mottles, moist, stiff, roots and sand at 1.3m	01050	8-153-KW									
_	-														
-															
_															
_	Direct Push			FILL: Sand, grey, wet, fine grained with silt lenses											
-															
-				FILL: Silty clay, dark grey, soft and wet with H2S odour											
2															
-				FILL: Sandy silt, black, roots, glass,	-										
				plastic, moist to wet with gravels and H2S odour	01050	98-155-KW									
_				FILL: Sand with trace silts, grey, fine grained to moist, moderately dense, moist											
	\checkmark			FILL: Silty clay, dark brown, soft with											
				H2S odour End of borehole.	1										
3															
Drill Company: Macquarie Drilling					Date Commenced:					01/05/2008					
Dril	l Mode	I:				Date Cor	nplete	ed:		01/05/2008					
Hol	e Diam	eter (n	nm):			Logged/	check	ed b	y:	Je	enkins	s/Weir			
											Sł	eet: 1 of 1			

Projec	ct ID:	CES)50706·	-BCC East	ing:	6243044	.653					SULTING	
Projec	ct:	Cook	s Cove	Nort	hing:	329936.0	013	Ξ	₹		SCIE	INTISTS	
Client	t:	Boyd	Cook C	Cove Elev	ation:			26-3	2 Pirra	ima Ro	oad Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399	
Locat	ion:	Cook	s Cove			Enviro	nmen	tal	Lo	g:	В	BH430	
DRIL	LING I	NFO.		LITHOLOGY		SAMPL	ING IN	FOR	MAT		I		
Depth M	ethod	Water	Symbol	Description	Sa	ample ID	Туре	0	FID/F	1) DI 200 DI	750 (mqc	WELL DETAIL	
0	. 1									_			
^	$\uparrow $			FILL: Grass over silty clay topsoil, dark brown, moist, rootlets and minor sand				\bullet					
-				FILL: Sand, pale grey, fine to medium grained, moderately dense, moist with shells throughout	30040	8-106-KW	Push Tube						
_				FILL: Silty peat layer at 0.6m (dark brown)	_								
				FILL: Orange/brown/grey mottles									
1-	Direct Push			FILL: Silty clay, dark brown, soft and moist	_								
	Direc			FILL: Sand, pale grey, fine to medium grained, wet with shells. Grading to silty clay at 1.6m									
- - 2 -				FILL: Silty clay, dark brown, stiff however soft due to moisture and organics									
_				FILL: Silt, black with gravels and	20040	08-107-KW	Push	\bullet					
_				organic odour FILL: Silty clay, dark brown, soft and moist		0-107-NVV	Tube						
				FILL: Sand, grey, fine to medium grained, moist and dense									
Drill Company: Macquarie Drilling				Date Commenced: 30/					30/04/1	2008			
	Model	-			Date Commenced.				-	30/04/2008 30/04/2008			
Hole Diameter (mm):			nm):			Logged/	-		oy:		lenkin	s/Weir neet: 1 of 1	
											0		

Proj	ect ID:	CESC)50706	-BCC Easti	ng:	6243011	.033					SULTING	
Proj	ect:	Cook	s Cove	North	ning:	329810.1	03	Ξ	₹	- 1	EAR SCIE	INTISTS	
Clie	nt:	Boyd	Cook (Cove Eleva	ation:			26-3	2 Pirrar	na Road	d Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399	
Loca	ation:	Cook	s Cove			Enviro	nmen	tal	Log	J:	B	BH431	
DR		NFO.		LITHOLOGY		SAMPL	ING IN						
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре	0	FID/P	ID (pp	750 Ú	WELL DETAIL	
	Direct Push			FILL: Grass over silty sand topsoil, brown, rootlets, fine grained, loose and moist FILL: Sand, medium grained, loose, dark grey grading to pale grey FILL: Silty sand, dark grey, fine to medium grained, moist, loose with ash and gravels FILL: Crushed sandstone, orange/white, course grained, moderately dense and moist FILL: Silty sand, pale to dark grey (lenses), moist, soft, organic odour and wet at 1.5m CLAYEY SAND: Clayey silty sand, grey, medium grained, dense, soft with organic odour. Shells at 2.1-2.2m. Grading to silty clay with trace sands at 2.5m	30040	18-84-KW	Push Tube Push Tube						
	\checkmark												
Dril	I Comp	any:	Ν	Macquarie Drilling	Date Commenced:				:	30/04/2008			
Dril	l Model	:				Date Cor	nplete	ed:		30)/04/2	2008	
Hole	e Diam	eter (n	nm):			Logged/o	check	ed k	by:	Je	enkin	s/Weir	
											Sł	neet: 1 of 1	

Project ID:	CES	050706	-BCC East	ing:	6243019.	116							
Project:	Cook	s Cove	Norti	hing:	329848.4	68	Ξ	₹		EAR SCIE	INTISTS		
Client:	Boyd	Cook C	Cove Eleva	ation:			26-3	2 Pirra	ma Roa	d Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399		
Location:	Cook	s Cove			Enviror	nmen	tal	Log	j:	В	BH433		
DRILLING	INFO.		LITHOLOGY		SAMPL	ING IN							
Depth Method	Water	Symbol	Description	Sa	mple ID	Туре		FID/P	200 (pt 200	220 mo	WELL DETAIL		
0 - - - - - - - - - - - - -			FILL: Grass over silty clay topsoil, dark brown, fine grained, moist with roots FILL: Sandy silt clay, brown with gravels, ceramic pieces, charcoal, moist and dense FILL: Silty clay, brown, moist and hard FILL: Silty clay, brown, moist and hard FILL: Silty clay becoming soft and moist FILL: Silty sand, grey, fine grained and wet FILL: Silty clay, dark grey, soft, moist to wet with organic odour FILL: Silty sand, grey, fine to medium grained, moderately dense and moist		B-157-КW	Push Tube Push Tube							
			FILL: Silty clay, dark brown, moist with H2S odour										
Drill Comp	pany: Macquarie Drilling				Date Commenced:					01/05/2008			
Drill Mode		_			Date Con	-				1/05/2			
Hole Diam	eter (r	nm):			Logged/c	check	ed k	oy:	Je		s/Weir		
										Sł	neet: 1 of 1		

Pro	ject ID:	CES)50706	-BCC Easti	ng: 624300	5.174			SULTING
Pro	ject:	Cook	s Cove	North	ning: 329919	.656		EAR SCIE	TH INTISTS
Clie	nt:	Boyd	Cook (Cove Eleva	ation:		Jones Bay Whar 26-32 Pirrama Ro PH: (02) 8569 22	oad Pyrmor	
Loc	ation:	Cook	s Cove		Envir	onmen	tal Log:	В	BH434
DF	RILLING	NFO.		LITHOLOGY	SAM	PLING IN			WELL DETAIL
Depth	Method	Water	Symbol	Description	Sample ID	Туре	FID/PID 2200 500 520	220 (mqc	
	Direct Push			FILL: Grass over sandy topsoil, dark brown, loose, dry to moist, rootlets with trace clays FILL: Sand, yellow, fine to medium grained, concrete rubble and gravels at 0.4m. Ironstone gravels at 0.8m FILL: Sand, grey, fine to medium grained, moderately dense, moist with shells FILL: Sand yellow, fine to medium grained, dense, wet with shells throughout FILL: Sand, grey, fine to medium grained, dense, wet grading to moist at 1.9m, Increasing clay content with depth FILL: Clayey sand, grey, fine to medium grained, and moist FILL: Silty clay, dark brown/grey, moist, soft grading to stiff with depth	300408-108-КW 300408-109-КW	Push Tube			
	Il Comp	-	N	Macquarie Drilling	Date Co Date Co)1/05/2)1/05/2	
Hole Diameter (mm): Logged/check				ed by:	lenkin	s/Weir			

Hole Diameter (mm):

Project ID:	CES)50706-	BCC Ea	asting:	6243031.	649					
Project:	Cook	s Cove	Να	orthing:	329978.7	96			7		NTIS TS
Client:	Boyd	Cook C	Cove El	evation:			26-32	Pirran	na Roa	d Pyrmor	ver Level Suite 121 t 2009 (02) 9552 4399
Location:	Cook	s Cove			Enviror	nmen	tal L	.og	:	B	BH435
	NFO.		LITHOLOGY		SAMPL	ING IN					
Depth Method	Water	Symbol	Description	S	ample ID	Туре			D (pp	750 Ŭ	WELL DETAIL
0 - - - - - - - - - - - - -			FILL: Grass over silty sand topsoil w trace clay, brown, moderately dense dry to moist with rootlets FILL: Clayey silt sand, grey/brown, fi grained, dense, dry to moist FILL: Sand, yellow grading to grey a 1.0m, fine to medium grained, moderately dense, moist to wet at 1.4m FILL: Silty clay, dark brown/grey, stif grading to soft with depth, moist to w FILL: Silty sand, dark brown/grey, fir grained, moist to wet	/ith 2, 30040 ine it 30040 30040 ff vet	08-110-KW	Push Tube		52		12	
Drill Company: Macquarie Drilling Drill Model: Hole Diameter (mm):				Date Commenced: Date Completed: Logged/checked by				: 01/05/2008			

Project ID:	CES	050706	-BCC Easti	i ng: 6242995	5.182				
Project:	Cook	s Cove	North	h ing: 330012. ⁻	116		EARTH SCIENTISTS		
Client:	Boyd	Cook (Cove Eleva	ation:		26-32 Pirrama Road	9-21, Lower Level Suite 121 9 Pyrmont 2009 FAX: (02) 9552 4399		
Location:	Cook	s Cove		Enviro	onmen	tal Log:	BBH436		
DRILLING	INFO.		LITHOLOGY	SAMP	LING IN		WELL DETAIL		
Depth Method	Water	Symbol	Description	Sample ID	Туре	FID/PID (pp	120 120		
			FILL: Grass over silty sand topsoil, fine grained, loose, moist with rootlets						
-			FILL: Sand, pale grey, fine to medium grained, loose, moist with black gravels	300408-87-KW	Push Tube				
_			FILL: Crushed sandtsone fill, white, coarse grained and slightly dense						
-			FILL: Sand with trace silt and clay at 1.1m, brown/grey/orange, medium grained, dense, moist	300408-88-KW	Push Tube				
- 1- 									
			SAND: Sand, pale grey, medium grained, dense, wet at 1.6m						
			SANDY CLAY: Sandy silty clay, dark grey, fine grained, moist with organic odour	-					
Drill Comp	Drill Company: Macquarie Drilling				mmen molete		30/04/2008		
Hole Diam		nm):		Date Co Logged/	-)/04/2008 nkins/Weir		
							Sheet: 1 of 1		

Proj	ect ID:	CES	050706	-BCC East	ing:	6242976	5.331					
Proj	ect:	Cook	s Cove	Norti	hing:	329674.7	761	Ξ	₹		EAR SCIE	INTISTS
Clie	nt:	Boyd	Cook (Cove Eleva	ation:			26-3	2 Pirra	ma Roa	d Pyrmor	wer Level Suite 121 ht 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove			Enviro	nmen	tal	Log	j:	B	BH438
DF		NFO.		LITHOLOGY		SAMPI	LING IN	FOR	МАТ	ION		
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре	0	FID/P 520	1 D (p) 200	220 m)	WELL DETAIL
0				FILL: Grass over silty sand topsoil, brown, dry loose with rootlets FILL: Silty sand with trace clay, brown, dry to moist, dense with rootlets	29040	8-72-KW	Push Tube	•				
-					_							
- - 1-				FILL: Sand, yellow, fine grained, dense, moist with shells	_							
-	ect Push			FILL: Clayey silt, dark brown with brown clay lenses, shells, organics and moist								
-	Direc			FILL: Sand, yellow/pale grey, medium grained, dense, wet with shells								
				FILL: Clayey silt, dark brown, soft and wet								
_				FILL: Slty clay, wet with ash and glass				\bullet				
2				FILL: Clayey silt, dark brown, soft, dense and wet		8-73-KW	Push Tube					
-	↓			SAND: Sand, grey, moist to wet, dense with shells								
	_										- 1-	
	I Comp	-	Ν	Macquarie Drilling		Date Co			:)/04/2	
	Drill Model: Hole Diameter (m		nm).			Date Cor Logged/	-		۰ ۷ ۰)/04/2	2008 s/Weir
		orei (11				Logyeu/	UNCCK	eu í	<i>.</i> y.	Je		neet: 1 of 1

Project ID	: CES	050706 [.]	-BCC E	asting:	6242962	.433					
Project:	Cook	s Cove	Ν	lorthing	j: 329755.3	357	4	₹		EAR SCII	ENTISTS
Client:	Boyd	Cook C	Cove E	Elevatio	n:		26-3	2 Pirra	ima Ro	ad Pyrmo	wer Level Suite 121 nt 2009 : (02) 9552 4399
Location:	Cook	s Cove			Enviro	nmen	tal	Loç	J:	E	BBH439
DRILLING	INFO.		LITHOLOGY		SAMPI	LING IN					
Depth Method	Water	Symbol	Description		Sample ID	Туре	0	FID/F 520	1) Ol i	220 (mqc	WELL DETAIL
0 - - - - - - - - - - - - -			 FILL: Grass over silty sand topsoil trace clay, brown, fine grained, dry with roots FILL: Sandy clay, brown sand with orange clay, black gravels, glass, or and odourless FILL: Silty sand, dark brown/orange with black gravels FILL: Sand, yellow, fine to medium grained, loose, dry to moist. Shells 1.0m with orange sand FILL: Silty clay sand, grey, moist, dense and odourless FILL: Silty clay, dark grey, soft and FILL: Silty clay sand, dark grey, de and moist to wet FILL: Silty clay sand, dark grey, moist, dense and soft 	r 01 dry 01 e 5 at 1 l wet 01	0508-133-KW 0508-134-KW 0508-135-KW	Push Tube Push Tube					
Drill Com	nanv	N	Macquarie Drilling		Date Co	mmen	പ		J	80/04/	2008
Drill Mode		, in the second s			Date Col			•		30/04/	
Hole Dian		nm):			Logged/	-		by:			s/Weir
										S	heet: 1 of 1

Projec	ct ID:	CES)50706	-BCC	Eastir	ng:	6242967	.601				
Projec	ct:	Cook	s Cove		North	ing:	329806.4	111	5	₹	J SCI	RTH IENTISTS
Client	:	Boyd	Cook (Cove	Eleva	tion:			26-32	Pirrama	Road Pyrn	Lower Level Suite 121 nont 2009 X: (02) 9552 4399
Locati	ion:	Cook	s Cove				Enviro	nmen	tal I	_og:		BBH440
DRIL	LING I	NFO.		LITHOLOGY			SAMPL	ING IN				WELL DETAIL
Depth Me	ethod	Water	Symbol	Description		Sa	mple ID	Туре		250 DIA/DI	(ppm)	WELL DETAIL
	Direct Push			FILL: Sand, yellow/pale grey wit orange mottles throughout, shel throughout, moist and moderate dense	loose th Is shy enses se with		8-148-KW	Push Tube				
Drill C	-	-	Ν	Aacquarie Drilling			Date Cor					/2008
Drill N			`				Date Cor	-				/2008
Hole I	ameות	eter (n	n m):				Logged/	CNECK	ea p	y:		ns/Weir Sheet: 1 of 1

Project ID:	CES	050706 [.]	-BCC East	ing: 6	6242971.	259			5		SULTING
Project:	Cook	s Cove	Nort	hing: 3	329862.3	01		₹	٦	EAR SCIE	NTIS TS
Client:	Boyd	Cook C	Cove Elev	ation:			26-32	Pirra	ma Roa	ad Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Location:	Cook	s Cove			Enviror	hmen	tal I	_00	j:	В	BH441
DRILLING	INFO.		LITHOLOGY		SAMPL	ING INI				-	WELL DETAIL
Depth Method	Water	Symbol	Description	Sam	ple ID	Туре	• F	550 UI :	1D (p	220 pm)	
0 			FILL: Grass over silty sand topsoil, fine grained, dark brown, loose, dry with roots FILL: Sand, yellow, fine grained, dry and loose FILL: Silty sand, brown, dry with shells FILL: Sand, pale grey, fine to medium grained, slightly dense, moist to wet with shells throughout FILL: Sand, grey with silt lenses, fine to medium grained, dense and wet FILL: Sand, grey with silt lenses, fine to medium grained, dense and wet	010508-		Push Tube					
				_					0		2008
Drill Comp		N	<i>l</i> acquarie Drilling		Date Con Date Con					0/04/2 0/04/2	
Hole Diam		nm):			.ogged/c			y:			s/Weir
	,							-			neet: 1 of 1

Project ID:	CESC)50706-	BCC	Easting: 6243065.80			802				
Project:	Cook	s Cove	I	Northi	ng:	329981.0	96			1	RTH IENTISTS
Client:	Boyd	Cook C	Cove	Elevat	ion:			26-32 P	irrama F	Road Pyrm	Lower Level Suite 121 nont 2009 X: (02) 9552 4399
Location:	Cook	s Cove				Enviror	nmen	tal Lo	og:		BBH442
DRILLING IN	NFO.		LITHOLOGY			SAMPL	ING IN				
Depth Method	Water	Symbol	Description		Sa	mple ID	Туре	FIC 0 کور	D/PID (WELL DETAIL
Direct Pursk			FILL: Grass over silty clay topsoil trace sand, dark brown, fine grain moist with rootlets FILL: Sand, brown/grey, fine to medium grained, loose, moist with shells FILL: Sand, pale grey, medium grained, moist, broken shells. Rock/gravels at 1.3m SILTY CLAY: Silty clay, dark brow organic odour, moist and soft	h	30040	8-102-KW	Push Tube Push Tube				
Drill Compa	anv:	Ν	lacquarie Drilling			Date Con	nmen	ced:	:	30/04	/2008
Drill Model:	-					Date Con					/2008
Hole Diame	ter (n	nm):				Logged/d	-		: .		ns/Weir Sheet: 1 of 1

Project	ID:	CESC)50706	-BCC East	ing:	6242955.	.64					
Project:	:	Cook	s Cove	Nort	hing:	330006.6	78		₹		SCIE	INTISTS
Client:	l	Boyd	Cook (Cove Elev	ation:			26-3	2 Pirra	ma Ro	ad Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Locatio	n:	Cook	s Cove			Enviro	nmen	tal	Log	g:	B	BH443
DRILLI	NG IN	IFO.		LITHOLOGY		SAMPL	ING IN					
Depth Meth	nod V	Vater	Symbol	Description	Sa	ample ID	Туре	0	FID/F 520	q) Ol 200	pm)	WELL DETAIL
0 				FILL: Grass over silty clay topsoil, dark brown, fine grained, loose to firm, dry to moist with rootlets FILL: Sand, trace clay, grey, fine grained, dense, moist to dry, gravels FILL: Crushed sandstone, orange/white, coarse grained, dense, moist to dry with rock/gravels FILL: Sand, dark grey, fine to medium grained, dense, trace clay, moist, grading to light grey with orange sand at 1.1m FILL: Silty clay, dark grey, minor medium grained sand, very dense with no odour FILL: Sand, grey/orange, medium grained, moderately dense, wet at 1.5m SILTY SAND: Silty sand, dark grey, fine grained, dense and moist to wet SILTY CLAY: Silty clay, dark grey, fine grained, dense and moist	3004C	98-90-KW 98-89-KW 98-89-KW	Push Tube Push Tube					
D									<u> </u>	~	0/0.4."	2000
Drill Co Drill Mo	-	ny:	ľ	Macquarie Drilling		Date Con Date Con			•		0/04/2 0/04/2	
Hole Di		ter (n	um).			Logged/d	-		<u>،</u> ۷۰			2008 s/Weir
	ante	(11						.	- y .	5		neet: 1 of 1
											0	

Project ID:	CES	050706 [.]	-BCC Easti	ng:					ONSULTING	
Project:	Cook	s Cove	North	ing:		Ξ	₹	- (ARTH CIENTIS TS	
Client:	Boyd	Cook C	Cove Eleva	tion:		26-3	2 Pirrama	a Road Py	1, Lower Level Suite 121 yrmont 2009 FAX: (02) 9552 4399	
Location:	Cook	s Cove		Enviro	nmen	tal	Log:		BBH445	
DRILLING	INFO.		LITHOLOGY	SAMP	LING IN	FOR	ΜΑΤΙΟ	NC		
Depth Method	Water	Symbol	Description	Sample ID	Туре	0		200 (mqq) (220 22		IL
0 			FILL: Grass over silty sand topsoil, dark brown, loose, dry with roots FILL: Sand, yellow, fine to medium grained, loose, dry. Brown silty lense at 1.2m FILL: Silty sand, grey, fine to medium grained, moist and dense FILL: Silty clay, dark brown, soft and wet SAND: Sand with trace silt, grey, fine to medium grained, moderately dense, shells throughout SILTY CLAY: Silty clay, dark grey, wet and soft with H2S odour SILTY SAND: Silty sand, fine to medium grained, moist with shells and dense SILTY CLAY: Silty clay, dark grey, SILTY SAND: Silty sand, grey, fine to medium grained, moist with H2S odour SILTY CLAY: Silty clay, dark grey, soft wet with H2S odour SILTY CLAY: Silty clay, dark grey, soft wet with H2S odour SILTY SAND: Silty sand, grey, fine to medium grained, moist to dry, fine grained with H2S odour	010508-138-KW 010508-137-KW 010508-136-KW 010508-139-KW	Push Tube Push Tube Push Tube					
Drill Comp	anv	Ν	Aacquarie Drilling	Date Co	mmen	ced		01/0	05/2008	
Drill Mode	-	I.	Service Primily	Date Co			•		05/2008	
Hole Diam		nm):		Logged/	-		oy:		kins/Weir	
									Sheet: 1 of 1	

Project ID:	CES	050706-	-BCC Easti	ng:	6242919.	264					SULTING
Project:	Cook	s Cove	North	ning:	329830.1	77	Ξ	₹	٦	EAR SCIE	INTISTS
Client:	Boyd	Cook C	Cove Eleva	ation:			26-3	2 Pirra	ma Roa	ad Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Location:	Cook	s Cove			Enviror	nmen	tal	Log	j :	B	BH446
DRILLING	INFO.		LITHOLOGY		SAMPL	ING IN	FOR	МАТ	ION		
Depth Method	Water	Symbol	Description	Sa	mple ID	Туре		FID/P	q) Dl	750 du	WELL DETAIL
Direct Push			FILL: Grass over silty clay topsoil, dark brown, moist with roots and gravels FILL: Sand, yellow, fine to medium grained layers, moist and loose FILL: Silty clay, dark grey/brown mottles, moist and rootlets FILL: Silty clay, dark grey, moist and rootlets FILL: Silty clay, dark grey, moist and soft FILL: Silty clay, dark grey, moist and soft FILL: Silty clay, dark grey, moist and soft FILL: Silty clay, dark grey, moist to dry FILL: Silty clay, dark grey, wet, soft with organic odour SILTY SAND: Silty sand, grey, moist to wet at 1.4m, dense with shells throughout SILTY CLAY: Silty clay, dark grey, wet, soft, H2S odour and shells at 2.7m		8-146-KW 8-147-KW	Push Tube Push Tube					
Drill Comp	anv:	N	lacquarie Drilling		Date Con	nmen	ced	:	0	1/05/2	2008
Drill Mode	-				Date Con					1/05/2	
Hole Diam	eter (n	nm):			Logged/c	-		oy:	J	enkin	s/Weir
										Sł	neet: 1 of 1

Project ID:	CES	050706	-BCC Eas	ting:	6242925	.015					SULTING
Project:	Cook	s Cove	Nor	thing:	329881.7	732	Ξ	₹	- 1	EAR SCIE	INTISTS
Client:	Boyd	Cook (Cove Elev	vation:			26-32	2 Pirrar	na Roa	d Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Location:	Cook	s Cove			Enviro	nmen	tal	Log	J:	В	BH447
DRILLING	INFO.		LITHOLOGY		SAMPL	ING IN	-		-		
Depth Method	Water	Symbol	Description	Sa	ample ID	Туре	• •	FID/P	1 D (pt	750 m	WELL DETAIL
0 - - - - - - - - - - - - -			 FILL: Grass over silty sand topsoil, brown, fine grained, loose, dry and roots FILL: Sand, yellow, fine to medium grained, loose, dry, becoming moist at 0.5m FILL: Silty sand, dark brown, fine grained, rootlets, moderately dense and moist FILL: Sand, pale grey, medium grained, moist, moderately dense, shells and gravels, brown silty clay lenses at 1.4m, moist to wet from 1.4m FILL: Silty clay, dark grey, minor sand, wet, soft with organic odour FILL: Soft clay, dark grey, wet, soft with organic odour SAND: Sand, pale grey, dark grey, modium grained, moist to wet with H2S odour SILTY CLAY: Silty clay, dark grey, moist, soft with H2S odour 	01050)8-144-KW	Push Tube					
	anvi	N	Macquarie Drilling		Date Co	nmor	004		01	/05/2	2008
Drill Comp Drill Mode	-	ľ			Date Col			•		/05/2	
Hole Diam		nm):			Logged/	-		oy:			s/Weir
										Sł	neet: 1 of 1

Project ID:	CES	050706-	-BCC	Eastin	ıg:	6242916.	076				•	SULTING
Project:	Cook	s Cove		Northi	ing:	329928.2	24	Η	₹		EAR SCIE	INTISTS
Client:	Boyd	Cook C	Cove	Elevat	ion:			26-32	2 Pirra	ma Ro	ad Pyrmor	ver Level Suite 121 it 2009 (02) 9552 4399
Location:	Cook	s Cove				Enviro	nmen	tal	Log] :	В	BH448
DRILLING	INFO.		LITHOLOGY			SAMPL	ING IN					
Depth Method	Water	Symbol	Description		Sa	nple ID	Туре	0	FID/P 520	1D (p	250 m	WELL DETAIL
0 - - - - - - - - - - - - -			FILL: Grass over silty clay topsol brown, stiff, moist with rootlets FILL: Sand, pale grey, fine to me grained, loose to dense, moist. S at 0.3m FILL: Silty clay, dark brown, shell soft with organic odour FILL: Sand, fine to medium grain pale grey, and wet SILTY CLAY: Silty clay, soft, wet brown with organic odour. Stiffer 2.0m SILTY SAND: Silty sand, grey, fi grained, dense, moist with organic odour SILTY CLAY: Silty clay, brown, s moist with organic odour. Becom stiffer with depth	edium Shells Ils, ned, t, from tic stiff,	300408	3-98-KW 3-99-KW	Push Tube Push Tube					
Drill Com	l:		Aacquarie Drilling			Date Con Date Con	nplete	ed:		0	1/05/2 1/05/2	2008
Hole Diam	ieter (n	nm):				Logged/d	neck	ed b	by:	J		s/Weir neet: 1 of 1

Proj	ect ID:	CES	050706	-BCC E	asting:	6242777	.469			5		
Proj	ect:	Cook	s Cove	N	lorthing	: 329955.3	331		₹		EAR SCIE	INTISTS
Clie	nt:	Boyd	Cook (Cove E	levatior	:		26-32	2 Pirrar	ma Roa	d Pyrmoi	wer Level Suite 121 nt 2009 (02) 9552 4399
Loca	ation:	Cook	s Cove			Enviro	nmen	tal I	Log	J:	B	BH450
DR		NFO.		LITHOLOGY		SAMP	LING IN					
Depth	Method	Water	Symbol	Description		Sample ID	Туре			ID (p)	220 pm)	WELL DETAIL
	Direct Push			FILL: Grass over silty sand topsoil, brown, dry, loose with roots FILL: Sand, yellow, fine to medium grained, loose, dry to moist (increa with depth), minor charcoal/coal fragments, from 0.1-0.8m. Crushed white sandstone at 0.8m FILL: Sand, yellow/pale grey, loose moist to wet and shells throughout SILTY CLAY: Silty clay, dark grey, and wet SAND: Sand, dark grey, fine to medium grained, wet and dense wi shells at silt lenses	sing 010 010 010 0,	1508-140-KW	Push Tube		35			
-				SILTY CLAY: Silty clay, dark grey, moist and soft SILTY CLAY: Sand with silt lenses dark grey, fine to medium grained a moist	,							
	l Comp I Model	-	<u>, / / </u>	Macquarie Drilling	1	Date Co Date Co					1/05/2	
Hole	e Diam	eter (n	nm):			Logged/	check	ed b	y:	Je	enkin	s/Weir
											SI	neet: 1 of 1

Pro	ject ID:	CES)50706	-BCC Eas	ting:	6242875	.203					SULTING
Pro	ject:	Cook	s Cove	Nor	thing:	329862.9	954	Н	₹	J	EAR SCIE	INTISTS
Clie	ent:	Boyd	Cook (Cove Elev	vation:			26-3	2 Pirrar	na Roa	d Pyrmor	wer Level Suite 121 nt 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove			Enviro	nmen	tal	Log	:	В	BH451
DI	RILLING	NFO.		LITHOLOGY		SAMPL	ING IN	-		-		
Depth	Method	Water	Symbol	Description	Sa	Imple ID	Туре	0	7220	ID (p) 200	220 m	WELL DETAIL
0]							
_	\uparrow			FILL: Sand, yellow, fine to medium grained, moist and loose		8-A1-KW	Grab					
_				FILL: Silty clay, brown, moist and soft with roots	01050	8-142-KW	Push Tube					
-				warroots								
_												
-												
					04050		Push	_				
				FILL: Sand, pale grey with orange	01050	8-143-KW	Tube					
_				lenses	_							
1-				FILL: Silty clay, dark brown, soft and wet								
_				SAND: Sand, grey fine to medium	-							
-				grained, dense with shells, silt lenses and H2S odour								
_	ect Push											
	Direct											
_				SILTY CLAY: Silty clay, dark grey, wet, soft with H2S odour								
_												
_												
2-				SILTY SAND: Silty sand, grey, fine to	\neg							
_				medium grained, wet and dense with H2S odour	Ì							
				CLAYEY SAND: Clayey silty sand, grey, soft and wet with H2S odour								
				9.0, 00.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	_							
_				SILTY SAND: Silty sand, grey, wet and dense with shells								
_				SILTY CLAY: Silty clay with trace	_							
-			/ _ / 	sand, wet with shells and H2S odour								
	✓		<u> r − · ⁄ − </u>		1		1					
Dri	ll Comp	any:	ľ	Macquarie Drilling		Date Cor	nmen	ced		0	1/05/2	2008
Dri	ll Model	:				Date Cor	nplete	ed:		0′	1/05/2	2008
Hol	le Diam	eter (n	nm):			Logged/	check	ed k	oy:	Je	enkin	s/Weir
											Sł	neet: 1 of 1

Project ID:	CES)50706	-BCC Easti	ng: 6242877	.696			
Project:	Cook	s Cove	North	ing: 329916.6	604	₹	SCI	ENTIS TS
Client:	Boyd	Cook (Cove Eleva	tion:		26-32 Pirrar	na Road Pyrmo	wer Level Suite 121 nt 2009 : (02) 9552 4399
Location:	Cook	s Cove		Enviro	nmen	tal Log): E	BBH452
DRILLING I	NFO.		LITHOLOGY	SAMPI	ING IN	FORMAT		WELL DETAIL
Depth Method	Water	Symbol	Description	Sample ID	Туре	0 550 JH	ID (ppm) 1200	
0 - - - - - - - - - - - - -			FILL: Grass over silty sand topsoil, dark brown, fine grained, loose, moist with rootlets and trace clays FILL: Sandy clay, dark brown, fine grained, dense/stiff and moist FILL: Sand, pale grey, fine to medium grained, loose and dense, moist with shells at 0.7-0.8m FILL: Silty clay, brown/dark grey mottles, stiff and moist FILL: Silty clay, dark brown, stiff, moist with organic odour. Soft layer at 1.4m FILL: Sand, aple grey, wet, fine to medium grained, loose with shells SILTY CLAY: Silty clay, dark brown, soft and wet SILTY SAND: Silty sand with trace clay, dark grey, wet and soft with shells. Increasing clay content from	300408-96-KW 300408-97-KW	Push Tube			
Drill Comp Drill Model Hole Diame	:		2.4m	Date Cor Date Cor Logged/	mplete	ed:		

Proj	ject ID:	CES	050706	-BCC Ea	sting:	6242882	.563		1			SULTING
Proj	ject:	Cook	s Cove	No	rthing:	329994.1	94	4		- 1	EAR CIE	IH NTISTS
Clie	nt:	Boyd	Cook (Cove Ele	vation:			26-32	Pirram	a Road	Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Loc	ation:	Cook	s Cove			Enviro	nmen	tal L	_og:	:	В	BH453
DF	RILLING I	NFO.		LITHOLOGY		SAMPL	ING IN	FORM	IATI	ON		
Depth	Method	Water	Symbol	Description	Sa	ample ID	Туре			2 (ppr 2 000		WELL DETAIL
0				FILL: Grass over silty sand topsoil wit trace clay, brown, dense, fine grained and moist with rootlets FILL: Crushed sandstone, orange/white, coarse grained and dry FILL: Sand, brown, fine to medium grained, loose and dry	30040)8-92-KW	Push Tube					
- - - 1- -				FILL: Clayey sand, brown, fine grained, dense and moist		93-KW	Push Tube					
-	Direct Push			FILL: Silty clay with trace sand, dark brown, fine grained, soft and dense, moist with slight organic odour SAND: Sand, grey, medium grained, dense and wet								
2-				SILTY CLAY: Silty sandy clay, dark grey, fine grained, moist, soft and dense								
_				SILT: Silt, black, moist with H2S odou	ır							
				SAND: Sand with trace silt and clay, pale grey, medium grained, dense an moist	d							
Dril	l Comp	anv [.]	N	Macquarie Drilling		Date Cor	nmen	ced.		01/	/05/2	2008
	l Model	-				Date Cor						2008
			nm):				-		v:			
	Hole Diameter		,-			Logged/checked by:		-	Jenkins/Weir Sheet: 1 of 1			

Project ID:	CES	050706-BCC	E	Easting:	6242816.	885				SULTING	
Project:	Cook	s Cove	Ν	Northing:	329876.0	16	₹	· · · · ·	EAR SCIE	NTIS TS	
Client:	Boyd	Cook Cove	E	Elevation:			26-32 Pirr	ama Road	Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399	
Location:	Cook	s Cove			Enviror	nment	tal Lo	g:	В	BH455	
DRILLING	INFO.	L	ITHOLOGY		SAMPL	ING INF	ORMA	TION			
Depth Method	Water	Symbol	Description	Sa	mple ID	Туре	0 250 JUI	PID (pp	750 (WELL DETAIL	
Depth Method	Water	FILL: Gras grained, dr FILL: Sanc medium gr FILL: Silty grained, lo FILL: Silty FILL: Sanc grained, lo FILL: Sanc grained, do SAND: Sa grained, do SAND: Sa grained, do	is over silty sand topsoil, ry to moist with rootlets d, light brown, fine to rained, loose, dry to moist sand, dark brown, fine ose and dry to moist d, yellow/pale grey, fine ose, dry to moist clay, dark brown and dry d, yellow, fine to medium ense and moist nd, pale grey, medium ense, moist with shells	, fine 010500 st 010500 y 1	mple ID 8-120-KW 8-121-KW	Type Push Tube Push Tube		200	20		
-		SILTY SAM	ND: Silty sand, dark grey ained and moist	/,							
			black, moist with organic	c							
		dour	End of borehole.								
3											
Drill Comp	any:	Macquari	e Drilling		Date Con	nmenc	ed:	01/05/2008			
Drill Mode	I:				Date Con	nplete	d:	01/05/2008			
Hole Diam	eter (n	nm):			Logged/c	checke	ed by:	Jenkins/Weir			
				Sheet: 1 of 1						eet: 1 of 1	

Project ID:	CES	050706	-BCC Easti	ng:				1	
Project:	Cook	s Cove	North	ning:		₹		EAR SCIE	NTIS TS
Client:	Boyd	Cook (Cove Eleva	tion:		26-32 Pirr	ama Roa	ad Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Location:	Cook	s Cove		Enviro	nmen	tal Lo	g:	В	BH456
DRILLING	INFO.		LITHOLOGY	SAMPI	LING IN				
Depth Method	Water	Symbol	Description	Sample ID	Туре	0 750 /DIA	PID (p	220 pm)	WELL DETAIL
Direct Dush			FILL: Grass over silty sand topsoil, dark brown, fine grain, dense, moist with rootlets FILL: Sandy silt, brown, moist and dense FILL: Sandy clay, brown with weathered/crushed sandstone (white/yellow) FILL: Silty clay, brown/grey, moderately stiff FILL: Sand, yellow, fine to medium grained, slightly dense, moist with shells SAND: Sand, pale grey, fine to medium grained, moderately dense, moist to wet at 1.4m SILTY SAND: Silty sand, grading to silty clay, wet from 1.9-2.2m SILTY SAND: Silty sand, grey, fine grained, moist and dense	010508-118-KW 010508-119-KW	Push Tube				
-			SILTY CLAY: Silty clay, dark grey, fine grained, soft, moist to wet SILTY SAND: Silty sand, grey, fine						
			grained, moist and dense/ SILTY CLAY: Silty clay, grey, minor	1					
		 − − − − − − − − − − − − − − − − − − −	sand and moist to wet						
Drill Comp	l:		Aacquarie Drilling	Date Co Date Co	mplete	d:	0	1/05/2	2008
Hole Diam	eter (n	nm):		Logged/	check	ed by:	Je		s/Weir neet: 1 of 1

Proj	ect ID:	CES	050706	-BCC	Easting:	6242838.	899					SULTING
Proj	ect:	Cook	s Cove		Northing:	329986.9	08	3	₹		EAR SCIE	TH INTISTS
Clier	nt:	Boyd	Cook (Cove	Elevation:			26-3	2 Pirra	ma Road	Pyrmor	ver Level Suite 121 ht 2009 (02) 9552 4399
Loca	ation:	Cook	s Cove			Enviro	nmen	tal	Log	J:	В	BH457
DR	ILLING	NFO.		LITHOLOGY		SAMPL	ING IN					
Depth	Method	Water	Symbol	Description	s	ample ID	Туре		FID/P	ID (pp	750 (WELL DETAIL
	Direct Push			 FILL: Grass over silty sand topso dark brown, fine grained, loose, r with rootlets FILL: Sandy clay, brown, fine grasoft, moist with rootlets FILL: Sand, dry to moist, black w ash(black and white), crunchy an sharp FILL: Crushed weathered sandst with trace clay, white/orange, der and dry to moist SILTY CLAY: Silty clay, dark broofine grained, stiff, soft from 1.1m, shells at 1.3m and organic odour 	noist ined, ith d 3004 one nse wn,	08-94-KW 08-95-KW	Push Tube					
_							_				10 4 12	
	Comp		Ν	Aacquarie Drilling		Date Commenced:				30/04/2008		
	Drill Model: Hole Diameter		nm).			Date Completed: Logged/checked by:				30/04/2008 Jenkins/Weir		
			,.			3300/0			.,.	Sheet: 1 of 1		

Project ID:	CES)50706·	-BCC Easti	ng: 6242800	.902				ONSULTIN	IG
Project:	Cook	s Cove	North	ning: 329820.4	421	3	₹	1	ARTH CIENTISTS	6
Client:	Boyd	Cook C	Cove Eleva	tion:		26-32	2 Pirrar	na Road P	21, Lower Level Suite Pyrmont 2009 FAX: (02) 9552 439	
Location:	Cook	s Cove		Enviro	nmen	tal I	Log	j:	BBH45	i 8
DRILLING	INFO.		LITHOLOGY	SAMPI	LING IN					
Depth Method	Water	Symbol	Description	Sample ID	Туре	F 0	520 DI	ID (ppm 2200		JETAIL
0 - - - - - - - - - -			FILL: Grass over silty sand topsoil, dark brown, loose, dry with rootlets FILL: Sand pale grey, fine to medium grained, loose and dry. Interspersed silt layers. H2S odour at 2.6m. Moist to wet at 2.8m SILT: Silt with trace clay, black, moist with strong H2S odour SILTY CLAY: Silty clay, dark grey, soft with strong H2S odour SILTY CLAY: Silty sandy clay, dark grey, dense with strong H2S odour	010508-124-KW 010508-123-KW 010508-122-KW 010508-125-KW	Push Tube Push Tube Push Tube					
Drill Comp Drill Mode Hole Diam	l:		<i>l</i> acquarie Drilling	Date Cor Date Cor Logged/	mplete	ed:		01/0	05/2008 05/2008 kins/Weir Sheet: 1 d	of 1

Project II	D: CES	050706-	BCC Easti	ng:				1	SULTING
Project:	Cook	ks Cove	North	ning:		₹		EAR SCIE	TH NTISTS
Client:	Boyd	l Cook C	Cove Eleva	tion:		26-32 Pirra	ama Roa	ad Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Location	: Cool	ks Cove		Enviro	nmen	tal Lo	g:	В	BH460
DRILLIN	g INFO.		LITHOLOGY	SAMPI	LING INF				
Depth Metho	d Water	Symbol	Description	Sample ID	Туре	0 550 FIDI	PID (p	220 pm)	WELL DETAIL
			FILL: Grass over silty sand topsoil, dark brown, fine grained, moist with rootlets FILL: Sand, yellow, fine to medium grained, moderately dense, moist shells, silty clay, lenses at 0.8m	010508-114-KW	Push Tube	_			
-				010508-115-KW	Push	_			
- - 1- -			FILL: Sand, pale grey, fine to medium grained, moderately dense and moist		Tube				
Direct Push			FILL: Silty clay, dark grey, soft, fine grained, moist to wet SAND: Sand, pale grey, fine to medium grained, wet at 1.5m and shells						
2			SILTY SAND: Silty sand, dark grey, fine to medium grained, wet with shells SILTY CLAY: Silty clay, dark grey, fine grained, soft to dense and wet						
			SILTY SAND: Silty sand, grey, medium grained, moist with shells SANDY SILT: Sandy silt, black/dark grey, organic and H2S odour						
Drill Con Drill Moo Hole Dia	el:		lacquarie Drilling	Date Co Date Co Logged/	mplete	d:	0		2008 s/Weir
							Sheet: 1 of 1		

Project	ID: C	ES0	50706	-BCC Easti	ng:	6243088.	007				
Project:	С	cook	s Cove	North	ning:	329478.5	34	₹	1	EAR' SCIE	NTIS TS
Client:	В	loyd	Cook (Cove Eleva	tion:			26-32 Pirra	ama Roa	d Pyrmont	rer Level Suite 121 t 2009 (02) 9552 4399
Locatio	n: C	Cooks	s Cove			Enviro	nment	tal Lo	g:	В	LG401
DRILLII	NG INF	[:] O.		LITHOLOGY		SAMPL	ING INF				
Depth Meth	od Wa	ater	Symbol	Description	Sa	ample ID	Туре	FIDIF 0 520	10 (pr	150 m	WELL DETAIL
Depin meth 				FILL: Sandy clay, brown with concrete rubble and gravel, crushed sandstone and ironstone gravels FILL: Clay, orange/grey/red mottled, gravels, shell, dry FILL: Sand, yellow, fine grained, dry to moist, gravels and clear plastic sheeting FILL: Black gravels, sand and dry FILL: Clay. Grey/orange/red, gravels, stiff and dry FILL: Clayey sand, brown/grey/red, with brown gravels, glass at 1.9m, crushed brick/sandstone SAND: Grey, fine grained, dense, dry to moist with silt lenses SAND: Pale grey, fine to medium grained, minor silt throughout, moist and dense. Becoming wet at 3.4m	02050	18-185-KW	Push Tube		200	120	
Drill Company: Macquarie Drilling Drill Model:			Date Commenced: Date Completed:			d:	02/05/2008 02/05/2008 02/05/2008				
Hole Dia	Hole Diameter		1m) : 7	7 5	Logged/checked by:						
						Sheet: 1 of 1					

Project ID:	CES	050706-	-BCC Easti	ng: 624308	38.007			SULTING
Project:	Cook	s Cove	North	ning: 329478	3.534	₹	EAR SCIE	INTISTS
Client:	Boyd	Cook C	Cove Eleva	ation:		26-32 Pirra	Wharf 19-21, Lov ama Road Pyrmor 569 2200 FAX:	
Location:	Cook	s Cove		Envir	onmen	tal Lo	g: B	LG402
DRILLING	INFO.		LITHOLOGY	SAM	PLING IN			WELL DETAIL
Depth Method	Water	Symbol	Description	Sample ID	Туре	0 250 DII	PID (ppm) 052	
0 0 			FILL: Grass over silty clay top soil, brown, fine grained, moist, loose with rootlets FILL: Silty sand clay, brown, dense, slightly moist, rootlets FILL: Silty sand, light brown, fine grained, dense, moist and shells FILL: Sand, pale grey, medium grained, dense, moist, orange sand mottles FILL: Silty clay, brown/orange/grey mottles, moist and stiff FILL: Silty sand, dark grey, fine grained, gravels, moist, wet at 1.7m. Minor clay content SILTY SAND: Silty clay sand, dark grey/brown, fine grained, soft and wet	020508-172-KW 020508-173-KW 020508-174-KW	Push Tube Push Tube			
Drill Comp Drill Mode	l:		<i>l</i> acquarie Drilling	Date Co	ommeno	ed:	02/05/2	2008
Hole Diam	eter (n	nm) : 7	5	Logged	d/check	ed by:	Jenkin: Sł	s/Weir neet: 1 of 1

Projec: Cooks Cove Development 2 29478.53 Tient: Boyd Cook Cove Elevation: Conserve	Proje	ct ID:	CES	050706	-BCC	Easti	ng:	6243088	.007					SULTING
Client: Bryd Cook Cove Elevation: Milling Market Mar	Proje	ct:	Cook	s Cove		North	ning:	329478.5	534	3	₹	٦		
DRILLING INFO. LITHOLOGY SAMPLING INFORMATION WELL DETAIL Depth Method Wate Symbol Description Sample ID Type State State State State 0	Client	t:	Boyd	Cook (Cove	Eleva	ation:			26-32	2 Pirra	ma Roa	d Pyrmon	t 2009
Depth Method Wetter Symbol Description Sample ID Type PIDPID (ppm) WELL DETAIL 0	Locat	tion:	Cook	s Cove				Enviro	nmen	tal I	Log] :	В	LG403
Depth Method Water Symbol Description Sample ID Type	DRIL	LING I	NFO.		LITHOLOGY			SAMPL	ING IN					
Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m 020508-181-KW Puth Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m 020508-182-KW Puth Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m 020508-182-KW Puth Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m 020508-182-KW Puth Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m 020508-182-KW Puth Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m 020508-182-KW Puth Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m 020508-182-KW Puth Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m Image: SAND: Pale grey, fine grained, dense, dry to mold, sill lenses wet at 2.4m 020508-182-KW Puth Image: dry to mold, sill lenses wet	Depth M	lethod	Water	Symbol	Description		Sa	mple ID	Туре					WELL DETAIL
Drill Model:Date Completed:02/05/2008Hole Diameter (mm):75Logged/checked by:Jenkins/Weir		Solid Flight	water		FILL: Sandstone rubble, orange gravels and dry FILL: Silty sand, dark brown, fir medium grained, loose and dry SAND: Pale grey, fine grained,	dense,	02050	8-181-KW	Push Tube		250	200	150	
Drill Model:Date Completed:02/05/2008Hole Diameter (mm):75Logged/checked by:Jenkins/Weir														
	Drill I	Model	:				Date Completed:					02/05/2008 Jenkins/Weir		

Pro	ject ID:	CES)50706	-BCC Easti	ng: 6243088	.007)	SULTING	
Pro	ject:	Cook	s Cove	North	ning: 329478.	534	₹	EAR SCIE	INTIS TS	
Clie	nt:	Boyd	Cook (Cove Eleva	ation:	26-3	32 Pirrama Ro	ad Pyrmor	ver Level Suite 121 it 2009 (02) 9552 4399	
Loc	ation:	Cook	s Cove		Enviro	nmental	Log:	В	LG404	
DF		NFO.		LITHOLOGY	SAMPI		MATION			
Depth	Method	Water	Symbol	Description	Sample ID	Type $_{\odot}$	FID/PID (p	750 ud	WELL DETAIL	
0			IL		1					
_	\uparrow			FILL: Silty sand top soil, brown, fine grained, dry and loose with gravels	020508-178-KW	Push Tube				
- - - - - - - - - - - - - - - - - - -	Auger Solid Flight			UNKNOWN: Coreless FILL: Sand, pale grey, fine grained, loose and dry. Silt layers interspersed, dark brown with ash SILTY SAND: Dark brown, fine grained, wet at 1.5m and shells SAND: Pale grey, fine to medium	020508-179-KW	Push Tube				
				grained, wet and dense SILTY SAND: Silty sand with clay content, dark grey and fine grained SAND: Pale grey, fine to medium grained SILTY CLAY: Dark brown, wet with	020508-180-KW	Push Tube				
				H2S odour End of borehole.						
			1		-					
Dril	I Comp	any:	P	Macquarie Drilling	Date Co	mmenced	l: 0	2/05/2	2008	
Dril	I Mode	:			Date Co	mpleted:	0	2/05/2	2008	
Hol	Hole Diameter (ter (mm): 75		Logged/checked by:			y: Jenkins/Weir		
								Sł	neet: 1 of 1	

Project ID:	CES)50706-	BCC	Easting	g:	6243174.	.979					
Project:	Cook	s Cove		Northi	ng:	329414.6	32		₹	- 1	EAR SCIE	NTISTS
Client:	Boyd	Cook C	Cove	Elevati	ion:			26-32	Pirran	na Road	d Pyrmon	ver Level Suite 121 t 2009 (02) 9552 4399
Location:	Cook	s Cove				Enviro	nmen	tal I	_og	:	В	MW401
DRILLING	NFO.		LITHOLOGY			SAMPL	ING IN					
Depth Method	Water	Symbol	Description		Sa	mple ID	Туре	• F	IP/DI 520	D (pp	220 m	WELL DETAIL
0 			TOPSOIL: Grass over silty sand, brown, dry, loose, rootlets with gravels. CONCRETE: Concrete rubble FILL: Crushed weathered sandsta FILL: Clayey sand fill, brown, fine grained, dry, large gravels. FILL: Clayet sandstone fill, whit dry. FILL: Clay fill with brown/orange s dry with black gravels. Asbestos fragments at 0.7m. FILL: Crushed sandstone, coarse grained, orange. FILL: Fill. Clay, brown/orange, sti dry, gravels, crushed sandstone, sandy clay with ash at 1.3m. SAND: Sand. Dark grey grading t pale grey. Fine grained, moist an loose. Becoming wet at 3.4m. Silt lenses throughout at depth.	one e te, sand, e iff,	02050	8-187-KW 8-A2-KW 8-188-LJ	Push Tube Push Tube					
Drill Comp Drill Model Hole Diam	:		Aacquarie Drilling			Date Con Date Con Logged/o	nplete	ed:		02	2/05/2 2/05/2 enkins	
					S					Sh	neet: 1 of 1	

Project ID:	CES)50706·	-BCC	Easting:	6243090.	.111					SULTING
Project:	Cook	s Cove		Northing:	329732.2	258		₹		EAR SCIE	NTIS TS
Client:	Boyd	Cook C	Cove	Elevation:			26-32	Pirram	na Road	Pyrmon	rer Level Suite 121 t 2009 (02) 9552 4399
Location:	Cook	s Cove			Enviro	nmen	tal L	_og	:	В	MW402
DRILLING I	NFO.		LITHOLOGY		SAMPL	ING INI					
Depth Method	Water	Symbol	Description	s	ample ID	Туре			D (pp)	1 20 m	WELL DETAIL
● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●			 FILL: Grass over silty sand top s dark brown, fine grained, loose, i with roots FILL: Sand, yellow, fine grained i grained. Moderately dense, mois shells FILL: Silty clay, dark brown. Fine grained sand, dense, moist with organinc odour FILL: Sand. Pale grey, fine to me grained, moist to wet, moderately dense with silt lenses. Wet at 1.6 FILL: Silty sand, minor clay, dark fine grained, moist to wet FILL: Silty clay. Dark brown, fine grained, soft, moist to wet FILL: Silt. Black, sandy and mois FILL: Crushed sansdtone, orange/white, clay content, moist at 2.4m) and odourless SILTY SAND: Dark brown, clay content with organic odour 	moist to st with edium y Sm							
Drill Comp	<u></u>	Λ	lacquarie Drilling		Date Con	nmon	od.		02	/05/2	2008
Drill Compa Drill Model	-	N			Date Con					/05/2	
Hole Diame		n m) : 7	75			-		y:			s/Weir
		-			Logged/checked			-			eet: 1 of 1

Project ID: CE	ES050706-BCC	Easting:	6242940.	504	CONSULTING	
Project: Co	ooks Cove	Northing:	329616.3	₹	EARTH SCIENTISTS	
Client: Bo	oyd Cook Cove	Elevation:		26-32 Pirram	Vharf 19-21, Lower Level Suite 121 na Road Pyrmont 2009 39 2200 FAX: (02) 9552 4399	
Location: Co	ooks Cove		Enviror	nmental Log	BMW403	
DRILLING INFO	D. LITHOLOGY		SAMPLI			
Depth Method Wate	ter Symbol Description	S	ample ID		D (ppm) WELL DETA	.IL
Depth Wethod Wate	FILL: Silty sand top soil, brown grained, moist with rootlets FILL: Clay, orange/brown/grey, rootlets and gravels FILL: Silty sand, brown, fine gr dry to moist and dense SAND: Yellow grading to grey, medium grained, dense moist. lenses throught from 1.4 to 2.8 SAND: Pale grey with minor sil throughout, dense and moist. Becoming wet at 3.4m	, fine , dry, ained, fine to Silt				
A Drill Company Drill Model: Hole Diameter			Date Com Date Com Logged/c		02/05/2008 02/05/2008 Jenkins/Weir Sheet: 1 of 1	

Pro	ject ID:		Eas	ting:		SULTING
Pro	ject:		Nor		ENTISTS	
Clie	ent:		Elev	ation:	Jones Bay Wharf 19-21, Lo 26-32 Pirrama Road Pyrmo PH: (02) 8569 2200 FAX	nt 2009
Loc	cation:			Environn	nental Log:	
D	RILLING	INFO.	LITHOLOGY	SAMPLIN	G INFORMATION	
Depth	Method	Water	Symbol Description	Sample ID T	FID/PID (ppm) ype 0 02 00 02 0 5 0 0 02 0	WELL DETAIL
	Auger Solid Flight	vvater	Symbol Description Image: Symbol FILL: Grass over silty sand top soil, brown, dry, loose with roots FILL: Crushed sandstone, white, coarse grained, gravels and ceramics FILL: Sand, brown, fine grained, loose, dry, black gravels with silt inclusions FILL: Sand, black, dry with black as gravels FILL: Sand, black, dry with black as gravels UNKNOWN: Core loss SAND: Sand, yellow, fine to medium grained, loose, dry to moist UNKNOWN: Core loss SAND: Sand, grey, fine to medium grained, loose, dry to moist	020508-175-KW	ype o 02 02 02 Push Fube I I I I I Push Fube I I I I I I Push Fube I I I I I I I	
	\downarrow					

Drill Company:

Drill Model:

Hole Diameter (mm):

Date Commenced:

Date Completed:

Logged/checked by:

Sheet:



Appendix 6 Summary of 95% UCL Calculation

	A B C	DE	F	G H I J K	1
1			-	Sets with Non-Detects	
2					
3	User Selected Options	3			
4	Date/Time of Computation	ProUCL 5.122/02/2023 6	:05:32 PM		
5	From File	WorkSheet.xls			
6	Full Precision	OFF			
7	Confidence Coefficient	95%			
8	Number of Bootstrap Operations	2000			
о 9					
9 10					
	B(a)P TEQ				
11 12	- (-)				
12			General	Statistics	
14	Tota	Number of Observations	86	Number of Distinct Observations	28
14				Number of Missing Observations	0
		Minimum	0.244	Mean	0.636
16		Maximum	5.755	Median	0.244
17		SD	1.022	Std. Error of Mean	0.211
18		Coefficient of Variation	1.607	Skewness	3.612
19					5.012
20			Normal (GOF Test	
21	c	Shapiro Wilk Test Statistic	0.445	Shapiro Wilk GOF Test	
22		5% Shapiro Wilk P Value	0.445	Data Not Normal at 5% Significance Level	
23		Lilliefors Test Statistic	0.351	Lilliefors GOF Test	
24	E	5% Lilliefors Critical Value	0.0957	Data Not Normal at 5% Significance Level	
25				% Significance Level	
26					
27		Δο	suming Norr	nal Distribution	
28	95% N	ormal UCL		95% UCLs (Adjusted for Skewness)	
29		95% Student's-t UCL	0.82	95% Adjusted-CLT UCL (Chen-1995)	0.864
30			0.02	95% Modified-t UCL (Johnson-1978)	0.827
31					0.027
32			Gamma	GOF Test	
33		A-D Test Statistic	14.43	Anderson-Darling Gamma GOF Test	
34		5% A-D Critical Value	0.779	Data Not Gamma Distributed at 5% Significance Leve	<u></u>
35		K-S Test Statistic	0.309	Kolmogorov-Smirnov Gamma GOF Test	
36		5% K-S Critical Value	0.0989	Data Not Gamma Distributed at 5% Significance Leve	<u>ə</u> l
37				ed at 5% Significance Level	
38					
39			Gamma	Statistics	
40		k hat (MLE)	1.155	k star (bias corrected MLE)	1.122
41		Theta hat (MLE)	0.551	Theta star (bias corrected MLE)	0.567
42		nu hat (MLE)	198.6	nu star (bias corrected MLE)	193
43	N	LE Mean (bias corrected)	0.636	MLE Sd (bias corrected)	0.601
44	IVI		0.000	Approximate Chi Square Value (0.05)	161.9
45	٨٩٣	sted Level of Significance	0.0472	Adjusted Chi Square Value	161.4
46	Auju		0.0472		
47		٨٥	umina Com	ma Distribution	
48	95% Approximate Gamma		0.759	95% Adjusted Gamma UCL (use when n<50)	0.761
49			0.759	55 /6 Aujusteu Gamina UCL (use when h<50)	0.701
50				COE Toot	
51		Noniro Wills Test Otalian		GOF Test	
52		Shapiro Wilk Test Statistic	0.649	Shapiro Wilk Lognormal GOF Test	

	А	В	С	D	E	F	G	Н	I	J	K		L
53					Wilk P Value				•	at 5% Signific		el	
54				Lilliefors	Test Statistic	0.315			-	ormal GOF			
55			5	% Lilliefors	Critical Value				Lognormal a	at 5% Signific	ance Leve	el	
56					Data Not L	.ognormal at	5% Signific	ance Level					
57													
58						Lognorma	I Statistics						
59					Logged Data						logged D		-0.944
60			I	Maximum of	Logged Data	1.75				SD of	logged D	ata	0.794
61													
62					Assi	uming Logno	rmal Distrib	ution					
63					95% H-UCL	0.637				Chebyshev (0.685
64			95%	Chebyshev	(MVUE) UCL	0.754			97.5%	Chebyshev ((MVUE) U	CL	0.851
65			99%	Chebyshev	(MVUE) UCL	1.041							
66													
67					-	etric Distribu							
68					Data do not f	ollow a Disc	ernible Distr	ribution (0.05	5)				
69													
70					-	rametric Dis	ribution Fre	e UCLs					
71					5% CLT UCL	0.818					ackknife U	-	0.82
72					ootstrap UCL	0.816					otstrap-t U		0.913
73					ootstrap UCL	0.833			95%	Percentile Bo	ootstrap U	CL	0.832
74					ootstrap UCL								
75				•	ean, Sd) UCL	0.967				hebyshev(Me	,		1.117
76			97.5% Cł	nebyshev(Me	ean, Sd) UCL	1.325			99% CI	hebyshev(Me	ean, Sd) U	CL	1.733
77													
78							UCL to Use						
79			95% Ch	ebyshev (Me	ean, Sd) UCL	1.117							
80													
81	N	lote: Sugge	-	•	ction of a 95%			·			iate 95% l	JCL.	
82					ations are bas	•							
83					upon the resu						•	'	
84	Hov	vever, simu	lations resul	ts will not co	ver all Real W	/orld data se	s; for additio	onal insight th	ne user may	want to cons	sult a statis	sticia	n.
85													

	A B C	DE	F	G H I J K	
1			•	Sets with Non-Detects	E.
2					
3	User Selected Options				
4	Date/Time of Computation	ProUCL 5.17/03/2023 10	:01:13 AM		
5	From File	WorkSheet.xls			
6	Full Precision	OFF			
7	Confidence Coefficient	95%			
8	Number of Bootstrap Operations	2000			
9					
10					
	B(a)P				
12					
13			General	Statistics	
14	Total	Number of Observations	88	Number of Distinct Observations	16
15				Number of Missing Observations	0
16		Minimum	0.05	Mean	0.249
17		Maximum	1.4	Median	0.205
18		SD	0.233	Std. Error of Mean	0.0248
19		Coefficient of Variation	0.936	Skewness	3.292
20					
20			Normal C	GOF Test	
21	St	napiro Wilk Test Statistic	0.573	Shapiro Wilk GOF Test	
22	5	5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level	
23		Lilliefors Test Statistic	0.37	Lilliefors GOF Test	
24	59	% Lilliefors Critical Value	0.0946	Data Not Normal at 5% Significance Level	
26		Data Not	Normal at 5	i% Significance Level	
20					
28		Ass	suming Norr	nal Distribution	
29	95% No	rmal UCL		95% UCLs (Adjusted for Skewness)	
30		95% Student's-t UCL	0.29	95% Adjusted-CLT UCL (Chen-1995)	0.299
31				95% Modified-t UCL (Johnson-1978)	0.291
32					
33			Gamma	GOF Test	
34		A-D Test Statistic	7.781	Anderson-Darling Gamma GOF Test	
35		5% A-D Critical Value	0.763	Data Not Gamma Distributed at 5% Significance Level	
36		K-S Test Statistic	0.315	Kolmogorov-Smirnov Gamma GOF Test	
37		5% K-S Critical Value	0.0964	Data Not Gamma Distributed at 5% Significance Level	l
38		Data Not Gamn	na Distribute	ed at 5% Significance Level	
39					
40			Gamma	Statistics	
41		k hat (MLE)	2.221	k star (bias corrected MLE)	2.153
42		Theta hat (MLE)	0.112	Theta star (bias corrected MLE)	0.115
43		nu hat (MLE)	391	nu star (bias corrected)	379
44	ML	E Mean (bias corrected)	0.249	MLE Sd (bias corrected)	0.169
45				Approximate Chi Square Value (0.05)	334.9
46	Adjust	ted Level of Significance	0.0473	Adjusted Chi Square Value	334.2
47		ł		· · · · · · · · · · · · · · · · · · ·	
48		Ass	uming Gam	ma Distribution	
49	95% Approximate Gamma	UCL (use when n>=50))	0.281	95% Adjusted Gamma UCL (use when n<50)	0.282
50				· · · · · · · · · · · · · · · · · · ·	
50					

	А	В	С	D	E	F	G	Н	I		J		К	I	L		
51						Lognorma	GOF Test										
52			S	hapiro Wilk	Test Statistic	0.852		Shap	oiro Will	k Logr	ormal GO	F Test					
53				5% Shapiro	Wilk P Value	2.222E-12		Data Not	Lognorn	nal at	5% Signific	cance L	evel				
54				Lilliefors	Test Statistic	0.276		Lill	liefors L	.ognoi	mal GOF ⁻	Test					
55			5	% Lilliefors	Critical Value	0.0946		Data Not Lognormal at 5% Significance Level									
56					Data Not L	ognormal at	5% Significa	ance Level									
57																	
58						Lognorma	I Statistics										
59				Minimum of	Logged Data	-2.996					Mean of	f logge	d Data	-1.6	333		
60			Ν	Maximum of	Logged Data	0.336					SD of	f logge	d Data	0.6	647		
61															-		
62					Assı	uming Logno	rmal Distrib	ution									
63					95% H-UCL	0.276			ç	90% C	hebyshev	(MVUE	E) UCL	0.2	294		
64			95%	Chebyshev	(MVUE) UCL	0.319			97	.5% C	hebyshev	(MVUE	E) UCL	0.3	353		
65			99%	Chebyshev	(MVUE) UCL	0.419											
66																	
67					Nonparame	etric Distribu	tion Free UC	L Statistics									
68					Data do not f	ollow a Disc	ernible Distri	ibution (0.05)								
69																	
70					Nonpa	rametric Dist	tribution Free	e UCLs									
71				9	5% CLT UCL	0.29					95% Ja	ackknif	e UCL	0.2	29		
72			95%	Standard B	ootstrap UCL	0.289					95% Bo	otstrap	-t UCL	0.3	307		
73			g	5% Hall's B	ootstrap UCL	0.307			9	95% P	ercentile B	ootstra	p UCL	0.2	293		
74				95% BCA B	ootstrap UCL	0.303											
75			90% Ch	ebyshev(M	ean, Sd) UCL	0.323			959	% Che	byshev(Me	ean, Sc	d) UCL	0.3	357		
76			97.5% Ch	ebyshev(M	ean, Sd) UCL	0.404			999	% Che	byshev(Me	ean, Sc	d) UCL	0.4	496		
77							1										
78						Suggested	UCL to Use										
79			95% Ch	ebyshev (M	ean, Sd) UCL	0.357											
80							L										
81	N	ote: Sugge	stions regard	ling the sele	ction of a 95%	UCL are pro	ovided to hel	p the user to	select t	the mo	st appropr	iate 95	% UCL				
82			F	Recommend	ations are bas	sed upon dat	a size, data o	distribution, a	and skev	wness							
83	-	These reco	mmendations	s are based	upon the resu	Its of the sim	ulation studio	es summariz	ed in Si	ingh, N	laichle, an	d Lee ((2006).				
84	Hov	vever, simu	lations result	s will not co	ver all Real W	/orld data set	ts; for additio	nal insight th	ne user i	may w	ant to cons	sult a s	tatistici	an.			
85																	
00																	

	A B C	DE	F	G H I J K	
1			-	Sets with Non-Detects	L
2					
3	User Selected Options				
4	Date/Time of Computation	ProUCL 5.16/03/2023 5:2	23:16 PM		
5	From File	WorkSheet.xls			
6	Full Precision	OFF			
7	Confidence Coefficient	95%			
8	Number of Bootstrap Operations	2000			
9					
-	Cu				
11					
12			General	Statistics	
13	Total	Number of Observations	156	Number of Distinct Observations	90
14		Number of Detects	141	Number of Non-Detects	15
15	N	umber of Distinct Detects	89	Number of Distinct Non-Detects	2
16		Minimum Detect	1.1	Minimum Non-Detect	1
17		Maximum Detect	260	Maximum Non-Detect	5
18		Variance Detects	1531	Percent Non-Detects	9.615%
19		Mean Detects	22.62	SD Detects	39.13
20		Median Detects	9.9	CV Detects	1.73
21		Skewness Detects	3.925	Kurtosis Detects	17.87
22		Mean of Logged Detects	2.365	SD of Logged Detects	1.16
23					
24				t on Detects Only	
25		hapiro Wilk Test Statistic	0.53	Normal GOF Test on Detected Observations Only	
26		5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
27		Lilliefors Test Statistic	0.291	Lilliefors GOF Test	
28	5	% Lilliefors Critical Value	0.075	Detected Data Not Normal at 5% Significance Level	
29		Detected Data	a Not Norma	I at 5% Significance Level	
30					
31	Kaplan-		-	ritical Values and other Nonparametric UCLs	
32		KM Mean	20.55	KM Standard Error of Mean	3.022
33		KM SD	37.61	95% KM (BCA) UCL	25.84
34		95% KM (t) UCL	25.55	95% KM (Percentile Bootstrap) UCL	25.68
35		95% KM (z) UCL	25.52	95% KM Bootstrap t UCL	27.51
36		90% KM Chebyshev UCL	29.62	95% KM Chebyshev UCL	33.73
37	97	.5% KM Chebyshev UCL	39.43	99% KM Chebyshev UCL	50.62
38		00mm- 005	Tooto on D	staated Observations Ophy	
39				etected Observations Only	
40		A-D Test Statistic	5.291	Anderson-Darling GOF Test	Lovel
41		5% A-D Critical Value	0.794	Detected Data Not Gamma Distributed at 5% Significance	Levei
42		K-S Test Statistic	0.176	Kolmogorov-Smirnov GOF	Lovel
43		5% K-S Critical Value	0.0819 Commo Dist	Detected Data Not Gamma Distributed at 5% Significance	Levei
44			admina Dist	ributed at 5% Significance Level	
45		Commo	Statiatics a	n Detected Data Only	
46		k hat (MLE)	0.789	k star (bias corrected MLE)	0.777
47		Theta hat (MLE)	28.68	Theta star (bias corrected MLE)	29.13
48		nu hat (MLE)	222.5	nu star (bias corrected MLE)	29.13
49		Mean (detects)	222.5		213.1
50		wear (detects)	22.02		

	A	В		С	-	D		E	=	1	F	-	G		1	Н	-			Т		J			К			
51	~	D		0		D			_		<u> </u>		u									0			ĸ		L	
52							Gan	nma	ROS	S Stat	istics	usi	ng Im	putec	d No	n-De	tects											
53			GRC	OS may	v not	be use	d wh	en	data s	et ha	s > 5()% I	NDs w	/ith m	any	tied o	obser	vatio	ns a	t mu	Itip	le Dl	_S					
54	GRO	OS may	/ not t	be used	l whe	n ksta	r of d	lete	cts is	small	such	as	<1.0,	espe	cially	y whe	n the	sam	ple s	size	is s	mall	(e.ç	g., <	15-2))		
55				Fo	or suc	h situa	ations	s, G	ROS	meth	od ma	ay y	ield in	corre	ct va	alues	of UC	CLs a	ind E	BTVs	5							
56			-				This	is e	espec	ially t	rue w	hen	the sa	ample	e siz	e is s	mall.											-
57		For gan	nma c	distribut	ted d	etecte	d data	a, B	STVs a	and U	CLs n	nay	be co	mput	ied u	ising	gamr	na dis	strib	utior	ח or	n KM	est	ima	tes			
58								Min	imum	0	.01														Mea	an	20.4	45
59							Ν	Лах	imum	26	0														Media	an	8.5	j
60									SD		7.79														C	:v	1.8	
61									MLE)).483										•				d ML		0.4	
62						Th			(MLE)		2.36							Т	heta						d ML		42.8	
63									MLE)											n	iu s	tar (t	oias	cor	recte	d)	149.1	1
64				djusted			-				.0485																	
65		••		ate Chi	•		`		. ,									ustec						•		• •	121.6	
66	95% (Gamma	i Appr	roximat	e UC	L (use	whe	n n	>=50)	2	5.02					95%	Gam	ma A	۸djus	sted	UC	L (u	se w	vher	n<5 ו	0)	25.0)6
67														-														
68						E						ram	eters	using	J KN	I Esti	mate	S							D ///			
69									(KM)		0.55														D (KI		37.6	
70									(KM)													SE			n (Kl		3.0	
71									(KM)).299														ar (Kl		0.2 92.7	
72									(KM)		3.17														ar (Kl	-		
73				000		nma p			(KM)		8.82 1.45									0/~~					ar (Kl	<i>`</i>	69. ⁻	
74						nma p			. ,		4.31														le (Kl le (Kl		181.8	
75				907	o yai	nna p	ercer	luie		9	+.31								99	⁄₀ y	am	illa þ	erc	enu		vi)	101.0	<u> </u>
76									Camn	na Ka	nlan-	Μοί	er (Kl	A) St	atiet	ice												
77		Ann	vovim	nate Ch	i Sau	are Va	alue (1.51			w) Ou	aust	103	Δι	djuste	-d C	hi Si	aus	re V	alue	- (9 <u>′</u>	2 71	B)	71.3	34
78	95% Gam										6.65				95%	6 Gar		-			· .			•		• •	26.7	
79						2 (0.00			,													- (•/		
80							Loan	orm	al GO)F Te	ston	De	tected	Obs	erva	ations		,										
81		Sh	napiro	Wilk A	ppro		-				.967						-	shapi	ro W	/ilk (GO	F Te	st					
82			· · ·		•••	Shapiro					.03			De	etect	ted D	ata N	ot Lo	gnoi	mal	at	5% 5	Sign	ifica	ance	Leve	el	
83 84					Li	lliefors	Test	t Sta	atistic	0	.0841							Lillie	efors	s GC	DF '	Test	-					
85				5	% Lil	liefors	Critic	cal '	Value	0	.075			De	etect	ted D	ata N	ot Lo	gnoi	rmal	at	5% 5	Sign	ifica	ance	_eve	el	
86						D	etect	ted	Data	Not L	.ogno	rma	al at 5°	% Sig	gnific	cance	Lev	el										
87																												
88						L	.ognc	orma	al RO	S Sta	itistic	s Us	sing lı	npute	ed N	lon-D	etect	s										
89					Me	ean in	Origiı	nal	Scale	2	0.53											Mea	in in	Lo	g Sca	le	2.1	13
90						SD in	Origiı	nal	Scale	3	7.74	+										S	D in	Lo	g Sca	le	1.3	56
91	(95% t U	JCL (a	assume	es no	rmality	of R	os	data)	2	5.53							ę	95%	Per	cer	ntile I	Boo	tstra	ap UC)L	25.7	7
92				1	95%	BCA E	Boots	trap	UCL	2	6.95										95	6% B	oots	stra	ot UC	L	27.5	59
93					959	% H-U	CL (L	.og	ROS)	2	7.45															\top		
94										•		- 1																
95				Statis	stics	using						d Da	ata an	d Ass	sum	ing L	ogno	mal	Dist	ribut	tion							
96									gged)		2.142														o Mea		8.5	
97									gged)		.296							ę	95%						M-Lo		2.4	
98			KMS	Standa	rd Er).104													•	VI -Lo		25.5	
90								. /1	gged)	1	.296			_	_	_	_	ç	95%	Crit	ica	ΗV	alue	~ / /	M_I 0	a)	2.4	98
99				Standa							0.104												uiu) e		<i>.</i> ,		

	А	В	С	D	E	F	G	Н	I	J	K	L
101												
102						DL/2 S	tatistics					
103			DL/2	Normal					DL/2 Log-T	Fransformed		
104				Mean in O	riginal Scale	20.51				Mean	in Log Scale	2.081
105				SD in O	riginal Scale	37.75				SD	in Log Scale	1.411
106			95% t L	ICL (Assume	es normality)	25.51				95%	H-Stat UCL	29.22
107			DL/2 i	s not a reco	mmended m	ethod, provi	ded for comp	parisons and	l historical re	easons		
108												
109					Nonparame	etric Distribu	tion Free UC	L Statistics				
110				Data do n	ot follow a D	iscernible D	istribution at	5% Signific	ance Level			
111												
112						Suggested	UCL to Use					
113			95	% KM (Chel	oyshev) UCL	33.73						
114												
115		Note: Sugges	stions regard	ing the seled	tion of a 95%	6 UCL are pr	ovided to hel	p the user to	select the m	nost appropria	ate 95% UCL	
116			F	lecommenda	ations are ba	sed upon da	ta size, data o	distribution, a	and skewnes	SS.		
117		These recor	nmendations	are based u	ipon the resu	Its of the sin	nulation studi	es summariz	zed in Singh,	Maichle, and	d Lee (2006).	
118	Ho	wever, simu	lations result	s will not cov	ver all Real W	/orld data se	ts; for additio	onal insight th	ne user may	want to cons	ult a statistici	an.
119												

	A B C	DE	F	G H I J K	L
1		UCL Statis	tics for Data	Sets with Non-Detects	
2					
3	User Selected Options	3			
4	Date/Time of Computation	ProUCL 5.122/02/2023 3	:45:06 PM		
5	From File	WorkSheet.xls			
6	Full Precision	OFF			
7	Confidence Coefficient	95%			
8	Number of Bootstrap Operations	2000			
9	Lead				
10					
11			General	Statistics	
12	Tota	Number of Observations	157	Number of Distinct Observations	91
13		Number of Detects	157	Number of Non-Detects	6
14	N	umber of Distinct Detects	89	Number of Distinct Non-Detects	2
15	IN	Minimum Detect			
16		Minimum Detect Maximum Detect	1.1	Minimum Non-Detect	1
17			1200	Maximum Non-Detect	5
18		Variance Detects	19471	Percent Non-Detects	3.822%
19		Mean Detects	63.45	SD Detects	139.5
20		Median Detects	26	CV Detects	2.199
21		Skewness Detects	5.963	Kurtosis Detects	41.82
22		Mean of Logged Detects	3.158	SD of Logged Detects	1.441
23					
24		Norm	al GOF Tes	t on Detects Only	
25	S	Shapiro Wilk Test Statistic	0.422	Normal GOF Test on Detected Observations Only	
26		5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level	
27		Lilliefors Test Statistic	0.327	Lilliefors GOF Test	
28	5	5% Lilliefors Critical Value	0.0725	Detected Data Not Normal at 5% Significance Level	
29		Detected Data	a Not Norma	l at 5% Significance Level	
30					
31	Kaplan-	Meier (KM) Statistics usir	ng Normal C	ritical Values and other Nonparametric UCLs	
32		KM Mean	61.08	KM Standard Error of Mean	10.96
33		KM SD	136.9	95% KM (BCA) UCL	80.13
33		95% KM (t) UCL	79.22	95% KM (Percentile Bootstrap) UCL	79.91
		95% KM (z) UCL	79.11	95% KM Bootstrap t UCL	93.6
35		90% KM Chebyshev UCL	93.97	95% KM Chebyshev UCL	108.9
36		7.5% KM Chebyshev UCL	129.5	99% KM Chebyshev UCL	170.2
37					
38		Gamma GOF	Tests on D4	etected Observations Only	
39		A-D Test Statistic	3.062	Anderson-Darling GOF Test	
40		5% A-D Critical Value	0.808	Detected Data Not Gamma Distributed at 5% Significance	
41		K-S Test Statistic	0.808	Kolmogorov-Smirnov GOF	
42				_	
43		5% K-S Critical Value	0.08	Detected Data Not Gamma Distributed at 5% Significance	Level
44		Detected Data Not (aamma Dist	ributed at 5% Significance Level	
45			04-41-11	Data at a Data Oak	
46				Detected Data Only	
47		k hat (MLE)	0.62	k star (bias corrected MLE)	0.612
48		Theta hat (MLE)	102.4	Theta star (bias corrected MLE)	103.7
49		nu hat (MLE)	187.1	nu star (bias corrected)	184.7
50		Mean (detects)	63.45		
51					
52		Gamma ROS	Statistics u	sing Imputed Non-Detects	
52					

	A B C D E	F	G H I J K	L
53	···	-	NDs with many tied observations at multiple DLs	_
54	GROS may not be used when kstar of detects is s	small such a	s <1.0, especially when the sample size is small (e.g., <15-20)	
55	For such situations, GROS r	method may	yield incorrect values of UCLs and BTVs	
56	This is especi	ally true whe	en the sample size is small.	
57	For gamma distributed detected data, BTVs a	nd UCLs ma	y be computed using gamma distribution on KM estimates	
58	Minimum	0.01	Mean	61.03
59	Maximum	1200	Median	25
60	SD	137.4	CV	2.251
61	k hat (MLE)	0.507	k star (bias corrected MLE)	0.502
62	Theta hat (MLE)	120.4	Theta star (bias corrected MLE)	121.7
63	nu hat (MLE)	159.2	nu star (bias corrected)	157.5
64	Adjusted Level of Significance (β)	0.0485		
65	Approximate Chi Square Value (157.48, α)	129.5	Adjusted Chi Square Value (157.48, β)	129.2
66	95% Gamma Approximate UCL (use when n>=50)	74.23	95% Gamma Adjusted UCL (use when n<50)	74.36
67				
	Estimates of G	amma Para	meters using KM Estimates	
68 69	Mean (KM)	61.08	SD (KM)	136.9
	Variance (KM)	18744	SE of Mean (KM)	10.96
70	k hat (KM)	0.199	k star (KM)	0.199
71	nu hat (KM)	62.5	nu star (KM)	62.64
72	theta hat (KM)	306.9	theta star (KM)	306.2
73	80% gamma percentile (KM)	80.38	90% gamma percentile (KM)	184.7
74	95% gamma percentile (KM)	314.9	99% gamma percentile (KM)	673.5
75		011.0		070.0
76	Gamm	a Kaplan-M	eier (KM) Statistics	
77	Approximate Chi Square Value (62.64, α)	45.43	Adjusted Chi Square Value (62.64, β)	45.3
78	95% Gamma Approximate KM-UCL (use when n>=50)	84.21	95% Gamma Adjusted KM-UCL (use when n<50)	84.46
79				
80 81	Lognormal GO	F Test on D	etected Observations Only	
82	Shapiro Wilk Approximate Test Statistic	0.972	Shapiro Wilk GOF Test	
83	5% Shapiro Wilk P Value	0.0863	Detected Data appear Lognormal at 5% Significance Le	evel
84	Lilliefors Test Statistic	0.0711	Lilliefors GOF Test	
85	5% Lilliefors Critical Value	0.0725	Detected Data appear Lognormal at 5% Significance Le	evel
86	Detected Data ap		rmal at 5% Significance Level	
87	· · · · ·			
88	Lognormal ROS	S Statistics	Using Imputed Non-Detects	
89	Mean in Original Scale	61.08	Mean in Log Scale	3.037
90	SD in Original Scale	137.3	SD in Log Scale	1.546
90 91	95% t UCL (assumes normality of ROS data)	79.22	95% Percentile Bootstrap UCL	81.09
91	95% BCA Bootstrap UCL	86.5	95% Bootstrap t UCL	93.25
92 93	95% H-UCL (Log ROS)	96.96		~
93 94				
94 95	Statistics using KM estimates	on Logged I	Data and Assuming Lognormal Distribution	
95 96	KM Mean (logged)	3.046	KM Geo Mean	21.03
90 97	KM SD (logged)	1.519	95% Critical H Value (KM-Log)	2.741
97 98	KM Standard Error of Mean (logged)	0.122	95% H-UCL (KM -Log)	93.01
90	KM SD (logged)	1.519	95% Critical H Value (KM-Log)	2.741
99 100	KM Standard Error of Mean (logged)	0.122		
101				
101		DL/2 S	tatistics	
102	DL/2 Normal		DL/2 Log-Transformed	
	Mean in Original Scale	61.07	Mean in Log Scale	3.031
104				

	А	В	С	D	E	F	G	Н	I	J	K	L
105				SD in O	riginal Scale	137.4				SD	in Log Scale	1.558
106			95% t l	JCL (Assume	es normality)	79.21				95%	H-Stat UCL	98.64
107			DL/2	is not a reco	mmended m	ethod, provi	ded for comp	arisons and	historical re	easons		
108												
109					Nonparame	etric Distribu	tion Free UC	L Statistics				
110				Detected I	Data appear	Lognormal [Distributed at	5% Signific	ance Level			
111												
112						Suggested	UCL to Use					
113					KM H-UCL	93.01						
114												
115	1	Note: Sugge	stions regard	ling the seled	ction of a 95%	5 UCL are pr	ovided to hel	p the user to	select the n	nost appropri	ate 95% UCL	•
116			F	Recommenda	ations are bas	sed upon dat	a size, data o	distribution, a	and skewnes	SS.		
117		These reco	mmendations	s are based ι	upon the resu	Its of the sim	ulation studi	es summariz	ed in Singh,	Maichle, and	d Lee (2006).	
118	Но	wever, simu	lations result	s will not cov	/er all Real W	/orld data se	ts; for additio	nal insight th	ne user may	want to cons	ult a statisticia	an.
119												

	A B C	D E	F	G H I J K								
1			•	Sets with Non-Detects	<u>L</u>							
2												
3	User Selected Options											
4	Date/Time of Computation	ProUCL 5.16/03/2023 1:4	43:51 PM									
5	From File	WorkSheet.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
	Ni											
11												
12			General	Statistics								
13	Total	Number of Observations	155	Number of Distinct Observations	63							
14		Number of Detects	125	Number of Non-Detects	30							
15	N	umber of Distinct Detects	62	Number of Distinct Non-Detects	3							
16		Minimum Detect	1	Minimum Non-Detect	1							
17		Maximum Detect	59	Maximum Non-Detect	5							
18		Variance Detects	77.61	Percent Non-Detects	19.35%							
19		Mean Detects	6.552	SD Detects	8.81							
20		Median Detects	3.4	CV Detects	1.345							
21		Skewness Detects	3.574	Kurtosis Detects	15.55							
22		Mean of Logged Detects	1.37	SD of Logged Detects	0.949							
23												
24				t on Detects Only								
25		hapiro Wilk Test Statistic	0.606	Normal GOF Test on Detected Observations Only								
26		5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level								
27		Lilliefors Test Statistic	0.264	Lilliefors GOF Test								
28	5	% Lilliefors Critical Value	0.0796	Detected Data Not Normal at 5% Significance Level								
29		Detected Data	a Not Norma	I at 5% Significance Level								
30												
31	Kaplan-		•	ritical Values and other Nonparametric UCLs	0.659							
32		KM Mean	5.49	KM Standard Error of Mean								
33		KM SD	8.174	95% KM (BCA) UCL	6.695 6.62							
34		95% KM (t) UCL	6.581	95% KM (Percentile Bootstrap) UCL								
35		95% KM (z) UCL	6.574	95% KM Bootstrap t UCL 95% KM Chebyshev UCL								
36		90% KM Chebyshev UCL	7.468									
37	97	.5% KM Chebyshev UCL	9.607	99% KM Chebyshev UCL	12.05							
38		Commo COE	Tooto on D	etected Observations Only								
39		A-D Test Statistic	4.033	Anderson-Darling GOF Test								
40		5% A-D Critical Value	0.78	Detected Data Not Gamma Distributed at 5% Significance								
41		K-S Test Statistic	0.78	Kolmogorov-Smirnov GOF								
42		5% K-S Critical Value	0.0853	Detected Data Not Gamma Distributed at 5% Significance								
43				ributed at 5% Significance Level								
44												
45		Gamma	Statistics or	n Detected Data Only								
46		k hat (MLE)	1.118	k star (bias corrected MLE)	1.097							
47		Theta hat (MLE)	5.858	Theta star (bias corrected MLE) 5.								
48		nu hat (MLE)		nu star (bias corrected)	274.2							
49 50		Mean (detects)	6.552									
50			2.00E									

— ——	A B	С	D	E		F	G	н			—	J			K	<u> </u>	1		
51	N B	0	U	<u> </u>		·	ų			•		0					<u> </u>		
52	Gamma ROS Statistics using Imputed Non-Detects																		
53		GROS ma	y not be used	when da	ta se	et has > 50%	NDs wit	n many tied	observ	ations	at mu	Itiple	DLs						
54	GROS m	nay not be use	d when kstar o	of detects	s is s	small such a	s <1.0, es	pecially wh	en the	sample	size	is sm	all (e	.g., <	15-20)				
55		F	or such situati	ons, GR	OS r	method may	yield inco	rrect values	s of UC	Ls and	BTV	5							
56			Т	his is esp	pecia	ally true whe	n the san	nple size is	small.										
57	For g	jamma distribu	ited detected of	data, BT\	/s a	nd UCLs ma	y be com	puted using	gamm	a distril	butior	ו on K	(M es	stima	tes				
58				Minim	um	0.01									Mear				
59				Maxim	um	59									Mediar	1 2	2.4		
60					SD	8.32									C٧	, ·	1.574		
61				k hat (M	· · ·	0.446						•			d MLE		0.441		
62			The	ta hat (M	LE)	11.86				Thet		•			d MLE		1.98		
63				nu hat (M		138.1					n	iu star	r (bia	s coi	rected	13	6.8		
64		-	d Level of Sig			0.0485													
65		proximate Chi	•	•		110.8				usted C				`			0.6		
66	95% Gamı	ma Approxima	te UCL (use w	vhen n>=	50)	6.528		95%	6 Gam	ma Adjı	usted	UCL	(use	whe	n n<50)) (6.54		
67																			
68			Es			amma Para	neters us	ing KM Est	timates	6									
69			\/-	Mean (k ariance (k	5.49							2		D (KM)		3.174			
70			Va	,	66.81						2	SE 01		n (KM)		0.659			
71				(M)	0.451									ar (KM)).447 8.5			
72				nu hat (k	-	139.9		nu star (KM)									2.29		
73		00	wing wing wing wing wing wing wing wing	eta hat (k		8.956		theta star (KM 90% gamma percentile (KM									2.29 5.19		
74			% gamma per	•		21.95							-				8.74		
75		30	/o gamma per	centile (r	(101)	21.95				3	19 /8 Y	amma	a per	Centi			0.74		
76				Ga	mm	a Kanlan-M	aior (KM)	Statistics											
77	Gamma Kaplan-Meier (KM) Statistics Approximate Chi Square Value (138.49, α) 112.3 Adjusted Chi Square Value (138.49, β)														11	2.1			
78	95% Gamma A	•	•		. ,	6.771		95% Gamma Adjusted KM-UCL (use when n<50)									5.784		
79		*F			,								(
80			La	anormal	GO	F Test on D	etected (bservation	s Onlv										
81		Shapiro Wilk		-		0.935			-	hapiro \	Wilk	GOF -	Test						
82 02			5% Shapiro V	Nilk P Va	lue	4.3615E-6		Detected [Data No	ot Logno	ormal	at 5%	6 Sig	nifica	ance Le	evel			
83 84			Lilliefors T	est Stati	stic	0.0982		Lilliefors GOF Test											
85			5% Lilliefors C	ritical Va	lue	0.0796		Detected [Data No	ot Logno	ormal	at 5%	6 Sig	nifica	ance Le	evel			
86			Det	tected Da	ata I	Not Lognorm	al at 5%	Significanc	e Leve	el .									
87																			
88			Lo	gnormal	ROS	S Statistics	Jsing Im	outed Non-I	Detects	\$									
89			Mean in Or	riginal Sc	ale	5.399						M	ean i	n Lo	g Scale	e (0.973		
90			SD in O	riginal Sc	ale	8.252							SD i	n Lo	g Scale		1.204		
91	95%	t UCL (assum	es normality o	f ROS da	ata)	6.496				95%	% Per	centil	e Bo	otstra	ap UCL	. 6	6.565		
92			95% BCA Bo	otstrap U	ICL	6.704		95% Bootstrap t UCL							. 6	6.782			
93			95% H-UCI	_ (Log RC	DS)	6.902													
94																			
95		Stat	istics using KI				Data and	Assuming l	ognor	mal Dis	stribu	tion							
96				ean (logg		1.114									o Mear		3.045		
97				SD (logg		1		95% Critical H Value (KM-Log)									2.208		
98		KM Standa	ard Error of Me	ean (logg		0.0808		95% H-UCL (KM -Log) 5.								5.999			
90		95% Critical H Value (KM-Log)						2.208											
99			KM ard Error of Me	SD (logg	-	1 0.0808				95%	% Crit	ісаі н	vait	Je (K	IVI-LOG				

	А	В	С	D	E	F	G	Н	I	J	K	L			
101															
102						DL/2 S	tatistics								
103			DL/2	Normal					DL/2 Log-1	Transformed					
104				Mean in C	riginal Scale	5.406				Mean	in Log Scale	0.999			
105				SD in C	riginal Scale				SD	in Log Scale	1.152				
106		95% t UCL (Assumes normality) 6.503 95% H-Stat UCL													
107			DL/2	s not a reco	mmended m	ethod, provi	ded for comp	parisons and	d historical re	easons					
108															
109	Nonparametric Distribution Free UCL Statistics														
110				Data do r	ot follow a D	iscernible D	istribution at	5% Signific	ance Level						
111															
112						Suggested	UCL to Use								
113			95	% KM (Che	byshev) UCL	8.364									
114															
115		Note: Sugge	stions regard	ing the sele	ction of a 95%	6 UCL are pr	ovided to he	p the user to	o select the n	nost appropria	ate 95% UCL				
116			F	Recommend	ations are ba	sed upon da	ta size, data	distribution,	and skewnes	SS.					
117		These recor	mmendations	are based	upon the resu	Ilts of the sin	nulation studi	es summariz	zed in Singh,	, Maichle, and	d Lee (2006).				
118	Ho	owever, simu	lations result	s will not co	ver all Real V	/orld data se	ts; for additic	onal insight t	he user may	want to cons	ult a statistici	an.			
119															

	A B C	DE	F	G H I J K	1								
1			-	Sets with Non-Detects	L								
2													
3	User Selected Options												
4	Date/Time of Computation	ProUCL 5.16/03/2023 11	:50:11 AM										
4 5	From File	WorkSheet.xls											
6	Full Precision	OFF											
7	Confidence Coefficient	95%											
8	Number of Bootstrap Operations	2000											
9													
10	Zn												
11													
12			General	Statistics									
13	Total	Number of Observations	156	Number of Distinct Observations	94								
14		Number of Detects	153	Number of Non-Detects	3								
15	Ν	umber of Distinct Detects	93	Number of Distinct Non-Detects	1								
16		Minimum Detect	2.1	Minimum Non-Detect	1								
17		Maximum Detect	540	Maximum Non-Detect	1								
18		Variance Detects	5913	Percent Non-Detects	1.923%								
19		Mean Detects	55.95	SD Detects	76.9								
20		Median Detects	32	CV Detects	1.374								
21		Skewness Detects	3.362	Kurtosis Detects	14.41								
22		Mean of Logged Detects	3.373	SD of Logged Detects	1.186								
23													
24				t on Detects Only									
25		Shapiro Wilk Test Statistic	0.643	Normal GOF Test on Detected Observations Only									
26		5% Shapiro Wilk P Value	0	Detected Data Not Normal at 5% Significance Level									
27		Lilliefors Test Statistic	0.242	Lilliefors GOF Test									
28	5	5% Lilliefors Critical Value	0.072	Detected Data Not Normal at 5% Significance Level									
29		Detected Data	a Not Norma	l at 5% Significance Level									
30													
31	Kaplan-	Meier (KM) Statistics usir		ritical Values and other Nonparametric UCLs									
32				KM Standard Error of Mean									
22		KM Mean	54.89		6.127								
33		KM SD	76.28	95% KM (BCA) UCL	64.79								
34		KM SD 95% KM (t) UCL	76.28 65.03	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL	64.79 65.12								
34 35		KM SD 95% KM (t) UCL 95% KM (z) UCL	76.28 65.03 64.97	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL	64.79 65.12 68.26								
34 35 36		KM SD 95% KM (t) UCL 95% KM (z) UCL 90% KM Chebyshev UCL	76.28 65.03 64.97 73.28	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL 95% KM Chebyshev UCL	64.79 65.12 68.26 81.6								
34 35 36 37		KM SD 95% KM (t) UCL 95% KM (z) UCL	76.28 65.03 64.97	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL	64.79 65.12 68.26								
34 35 36 37 38		KM SD 95% KM (t) UCL 95% KM (z) UCL 90% KM Chebyshev UCL 7.5% KM Chebyshev UCL	76.28 65.03 64.97 73.28 93.16	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL 95% KM Chebyshev UCL 99% KM Chebyshev UCL	64.79 65.12 68.26 81.6								
34 35 36 37 38 39		KM SD 95% KM (t) UCL 95% KM (z) UCL 90% KM Chebyshev UCL 7.5% KM Chebyshev UCL Gamma GOF	76.28 65.03 64.97 73.28 93.16 Tests on De	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL 95% KM Chebyshev UCL 99% KM Chebyshev UCL	64.79 65.12 68.26 81.6								
34 35 36 37 38 39 40		KM SD 95% KM (t) UCL 95% KM (z) UCL 90% KM Chebyshev UCL 7.5% KM Chebyshev UCL Gamma GOF A-D Test Statistic	76.28 65.03 64.97 73.28 93.16 Tests on De 1.862	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL 95% KM Chebyshev UCL 99% KM Chebyshev UCL etected Observations Only Anderson-Darling GOF Test	64.79 65.12 68.26 81.6 115.9								
34 35 36 37 38 39 40 41		KM SD 95% KM (t) UCL 95% KM (z) UCL 90% KM Chebyshev UCL 7.5% KM Chebyshev UCL Gamma GOF A-D Test Statistic 5% A-D Critical Value	76.28 65.03 64.97 73.28 93.16 Tests on De 1.862 0.788	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL 95% KM Chebyshev UCL 99% KM Chebyshev UCL etected Observations Only Anderson-Darling GOF Test Detected Data Not Gamma Distributed at 5% Significance	64.79 65.12 68.26 81.6 115.9								
34 35 36 37 38 39 40 41 42		KM SD 95% KM (t) UCL 95% KM (z) UCL 90% KM Chebyshev UCL 7.5% KM Chebyshev UCL 7.5% KM Chebyshev UCL 7.5% A-D Test Statistic 5% A-D Critical Value K-S Test Statistic	76.28 65.03 64.97 73.28 93.16 Tests on De 1.862 0.788 0.105	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL 95% KM Chebyshev UCL 99% KM Chebyshev UCL 99% KM Chebyshev UCL 99% KM Chebyshev UCL Detected Observations Only Anderson-Darling GOF Test Detected Data Not Gamma Distributed at 5% Significance Kolmogorov-Smirnov GOF	64.79 65.12 68.26 81.6 115.9 Level								
34 35 36 37 38 39 40 41 42 43		KM SD 95% KM (t) UCL 95% KM (z) UCL 90% KM Chebyshev UCL 7.5% KM Chebyshev UCL 7.5% KM Chebyshev UCL 7.5% AD Critical Value K-S Test Statistic 5% K-S Critical Value	76.28 65.03 64.97 73.28 93.16 Tests on De 1.862 0.788 0.105 0.0783	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL 95% KM Chebyshev UCL 99% KM Chebyshev UCL 99% KM Chebyshev UCL etected Observations Only Anderson-Darling GOF Test Detected Data Not Gamma Distributed at 5% Significance Kolmogorov-Smirnov GOF Detected Data Not Gamma Distributed at 5% Significance	64.79 65.12 68.26 81.6 115.9 Level								
34 35 36 37 38 39 40 41 42 43 44		KM SD 95% KM (t) UCL 95% KM (z) UCL 90% KM Chebyshev UCL 7.5% KM Chebyshev UCL 7.5% KM Chebyshev UCL 7.5% AD Critical Value K-S Test Statistic 5% K-S Critical Value	76.28 65.03 64.97 73.28 93.16 Tests on De 1.862 0.788 0.105 0.0783	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL 95% KM Chebyshev UCL 99% KM Chebyshev UCL 99% KM Chebyshev UCL 99% KM Chebyshev UCL Detected Observations Only Anderson-Darling GOF Test Detected Data Not Gamma Distributed at 5% Significance Kolmogorov-Smirnov GOF	64.79 65.12 68.26 81.6 115.9 Level								
34 35 36 37 38 39 40 41 42 43 44 45		KM SD 95% KM (t) UCL 95% KM (z) UCL 90% KM Chebyshev UCL 7.5% Chebyshev UCL	76.28 65.03 64.97 73.28 93.16 Tests on De 1.862 0.788 0.105 0.0783 Gamma Distr	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL 95% KM Chebyshev UCL 99% KM Chebyshev UCL 99% KM Chebyshev UCL etected Observations Only Anderson-Darling GOF Test Detected Data Not Gamma Distributed at 5% Significance Kolmogorov-Smirnov GOF Detected Data Not Gamma Distributed at 5% Significance	64.79 65.12 68.26 81.6 115.9 Level								
34 35 36 37 38 39 40 41 42 43 44 45 46		KM SD 95% KM (t) UCL 95% KM (z) UCL 90% KM Chebyshev UCL 7.5% Chebyshev UCL	76.28 65.03 64.97 73.28 93.16 Tests on De 1.862 0.788 0.105 0.0783 Gamma Distr	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL 95% KM Chebyshev UCL 99% KM Chebyshev UCL 99% KM Chebyshev UCL etected Observations Only Anderson-Darling GOF Test Detected Data Not Gamma Distributed at 5% Significance Kolmogorov-Smirnov GOF Detected Data Not Gamma Distributed at 5% Significance ributed at 5% Significance Level	64.79 65.12 68.26 81.6 115.9 Level								
34 35 36 37 38 39 40 41 42 43 44 45 46 47		KM SD 95% KM (t) UCL 95% KM (z) UCL 90% KM Chebyshev UCL 7.5% KM C	76.28 65.03 64.97 73.28 93.16 Tests on De 1.862 0.788 0.105 0.0783 Gamma Distr Statistics on	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL 95% KM Chebyshev UCL 99% KM Chebyshev UCL 90% KM Chebyshev UC	64.79 65.12 68.26 81.6 115.9 Level								
34 35 36 37 38 39 40 41 42 43 44 45 46		KM SD 95% KM (t) UCL 95% KM (z) UCL 90% KM Chebyshev UCL 7.5% KM C	76.28 65.03 64.97 73.28 93.16 Tests on De 1.862 0.788 0.105 0.0783 Gamma Distr Statistics on 0.898	95% KM (BCA) UCL 95% KM (Percentile Bootstrap) UCL 95% KM Bootstrap t UCL 95% KM Chebyshev UCL 99% KM Chebyshev UCL 99% KM Chebyshev UCL 99% KM Chebyshev UCL Extected Observations Only Anderson-Darling GOF Test Detected Data Not Gamma Distributed at 5% Significance Kolmogorov-Smirnov GOF Detected Data Not Gamma Distributed at 5% Significance ributed at 5% Significance Level	64.79 65.12 68.26 81.6 115.9 Level Level Level								

— ——	A B		С	D		1	E			F	1	G		Н				- r		J	- 1		К	—						
51			0				<u> </u>					u								0				_						
52	Gamma ROS Statistics using Imputed Non-Detects																													
53		GR	OS may	not be ı	used	whe	n dat	ta se	et has	> 50%	% N	Ds wi	th ma	any tiec	lobs	erva	tions	at m	ulti	ple D)Ls									
54	GROS	may not	be used	when k	star	of de	tects	s is s	small s	such a	as <	1.0, e	spec	ially wł	ien th	ne sa	ample	size	e is	sma	ll (e	.g., •	<15-2	0)						
55			Fo	r such s	situati	ions,	GRC	DS r	netho	d may	/ yie	ld inc	orrec	t value	s of l	JCL	s and	BT∖	/s											
56					Т	his is	s esp	pecia	ally tru	le who	en t	he sa	mple	size is	sma	II.														
57	For	gamma	distribut	ed deteo	cted	data,	, BTV	/s a	nd UC	Ls m	ay b	e con	npute	ed using	g gan	nma	distri	butic	on d	on KN	∕l es	stima	ates							
58						Μ	linim	um	0.0)1													Me	an	54.	.88				
59		540														Medi	an	32												
60			.54													(CV	1.:	395											
61				761													ed ML		0.7	-										
62			.13							The						ed ML		73.												
63		237										nu	star	(bia	s co	rrecte) (bé	234.	.1											
64)485																											
65	A	199							•	ted C					•		• •	199.												
66	95% Gam	64	.33				959	% Ga	IMM	a Adji	usteo	d U	CL (ι	lse	whe	n n<5	50)	64.	.43											
67																														
68	Estimates of Gamma Parameters using KM Estimates Mean (KM) 54.89 SD (KM)																													
69		54 5819												_ (76.												
70	Variance (KM)																			S	E Of		an (K	,		127				
71	k hat (KM)								0. 161	518													ar (K			512				
72	nu hat (KM) theta hat (KM)												nu star (KM) theta star (KM)								-	159.								
73			000	6 gamma					106	.24			90% gamma percentile (KM								,	107. 147.								
74				6 gamma					209		-								<u> </u>		-		ile (K		359.					
75			307	o yamma		Cent		(111)	209	. 1							6	19 /0	yai	IIIIa	pen	Cent		101)						
76							Ga	mm	a Kar	lan-M	منما	r (KM) Sta	tistics																
77	Gamma Kaplan-Meier (KM) Statistics Approximate Chi Square Value (159.81, α) 131.6 Adjusted Chi Square Value (159.81, β)														131.	3														
78	95% Gamma	• •		•		•			66		+	95% Gamma Adjusted KM-UCL (use when n<50)									• •	66.								
79								00)									Juoto			02 (0				/0/						
80					Lc	anoi	rmal	GO	F Tes	t on D	Dete	ected	Obse	ervation	ns Or	nlv														
81		Shapir	o Wilk A	pproxim		-				974						•	apiro	Wilk	G	DF T	est									
82				5% Shaj						127			Dete	cted Da	ata ai		•					ignif	icanc	e Le	evel					
83 84				Lillief	fors T	Fest S	Statis	stic)626						•••	illiefo					-								
85			5	% Lillief	ors C	Critica	al Val	lue)72			Dete	cted Da	ata aj							ignif	icanc	e Le	evel					
86					Dete	cted	Data	a ap	pear	Logno	orma	al at 5	5% S	ignifica	nce l	Leve	el													
87																														
88					Lo	gnor	mal F	ROS	S Stat	istics	Usi	ng Im	pute	d Non-	Dete	cts														
89				Mean	in O	rigina	al Sca	ale	54	.9										Me	an i	n Lo	g Sca	ale	3.3	314				
90				SD	in O	rigina	al Sca	ale	76	.52	\uparrow									5	SD i	n Lo	g Sca	ale	1.2	248				
91	95%	t UCL (assume	s norma	ality c	of RO)S da	ata)	65	.04	1						959	% Pe	erce	entile	Bo	otstr	ap U	CL	65.	.75				
92			9	95% BC	A Bo	otstr	ap U	CL	66	.97	1	95% Bootstrap t UCL							CL	67.	.18									
93				95% H	I-UCI	L (Lo	g RC	DS)	76	.62														\uparrow						
94																														
95			Statis	tics usi	ng K	M es	timat	tes	on Lo	gged	Dat	a and	Ass	uming	Logn	orm	al Dis	stribu	utio	n										
96				K	M Me			-		308													eo Me			27.34				
97							logge	-	1.	259		95% Critical H Value (KM-Log)										2.46								
57	KM Standard Error of Mean (logged)									101			95% H-UCL (KM -Log) 77									77.								
98			otanaa		KM SD (logged) 1.259										95% Critical H Value (KM-Log) 2.4							16								
			Standa		KM			-		259 101							959	% Cr	itic	al H \	Valu	le (k	(M-Lo)g)		40				

	А	В	С	D	E	F	G	Н	I	J	K	L		
101														
102						DL/2 S	Statistics							
103			DL/2	Normal					DL/2 Log-	Transformed				
104				Mean in C	Driginal Scale	54.88				Mean	in Log Scale	3.295		
105				SD in C	Driginal Scale	76.53				SD	in Log Scale	1.301		
106		95% t UCL (Assumes normality) 65.02 95% H-Stat UCL												
107			DL/2 i	s not a reco	ommended m	ethod, provi	ided for com	parisons and	d historical re	easons				
108														
109					Nonparam	etric Distribu	ution Free UC	CL Statistics						
110		Detected Data appear Lognormal Distributed at 5% Significance Level												
111														
112						Suggested	UCL to Use							
113					KM H-UCL	77.44								
114														
115		Note: Sugge	stions regard	ing the sele	ction of a 95%	6 UCL are p	rovided to he	lp the user to	o select the n	nost appropri	ate 95% UCI			
116			F	Recommend	ations are ba	sed upon da	ta size, data	distribution,	and skewnes	SS.				
117		These recor	mmendations	are based	upon the resu	Its of the sir	nulation stud	es summariz	zed in Singh,	, Maichle, an	d Lee (2006).			
118	Но	owever, simu	lations result	s will not co	ver all Real V	Vorld data se	ets; for addition	onal insight t	he user may	want to cons	ult a statistic	an.		
119														