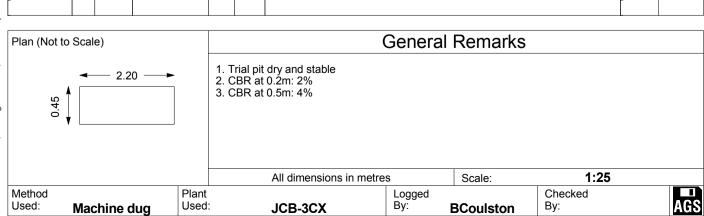


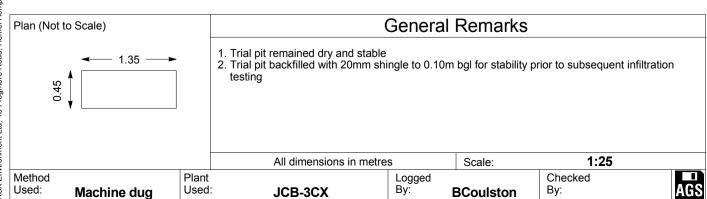
Contract:							Client:		Trial P	it:	
		NIAE	B - Phase	1			BD	W Trading Limited			TP6
Contract Re	f:		Date			Grour	nd Level (m AOD):	National Grid Co-ordinate:	Sheet		
	254	59		28.0	8.21		17.72	E:543416.0 N:260636.0)	1	of 1
Samp Depth	oles a	nd In-si Type	tu Tests Results	Water	Backfill			Description of Strata		Depth (Thick ness)	
0.20	1	ES				silty flint.	CLAY with traces Occasional suban	vested crop remains over dark bro of subangular to subrounded fine gular fine to medium brick clasts.	to coarse	(0.35)	
0.50 0.50 0.50 0.50	2 3	ES D V	c _u =49			pred fine	i to stiff orangey-bi lominantly fine to to coarse flint and ULT FORMATION	own slightly gravelly silty sandy CLA` medium. Gravel is subangular to su chert.)	Sand is brounded	(0.65)	x x
1.00	4	D V	c _u =59 c _u =64			to m Rare (GA	edium. Occasiona		claystone.	1.00	
2.50		V	c _u =83							- - - - -	
										3.20	xx



GINT LIBRARY_V8_04.GLBILog TRIAL PIT LOG - STANDARD | 25459 NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 16:36 | OP.
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Contract:		Client:		Trial Pit:	
NIAB - Ph	ase 1	BDV	V Trading Limited		TP6 (i)
Contract Ref:	Date:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:	
25459	29.08.12	12.89	E:544120.0 N:260938.0	1	of 1
Samples and In-situ Tests Depth No Type Res	s atlant stlus		Description of Strata	Dep (Thickness	k Graphic
0.20 1 ES		Sand is fine to coarse subangular fine to medi	c brown silty sandy slightly gravelly e (predominantly fine to medium). Gr um flint. Rare subangular fragments of nics. Fine roots and rootlets throughout.	CLAY. avel is fine to	5)
0.40 V C _u i	=46	Firm orangey-brown gr (predominantly fine to n fine to coarse flint. Occa (RIVER TERRACE DEF	ounded [(0.7	5)	
	=68	@ 0.5 to 0.7m Horizo clayey SAND	n of gravelly very sandy CLAY / grave	lly very - 1.10)
		\@ 1.0m Reduction in s	sand and gravel content		



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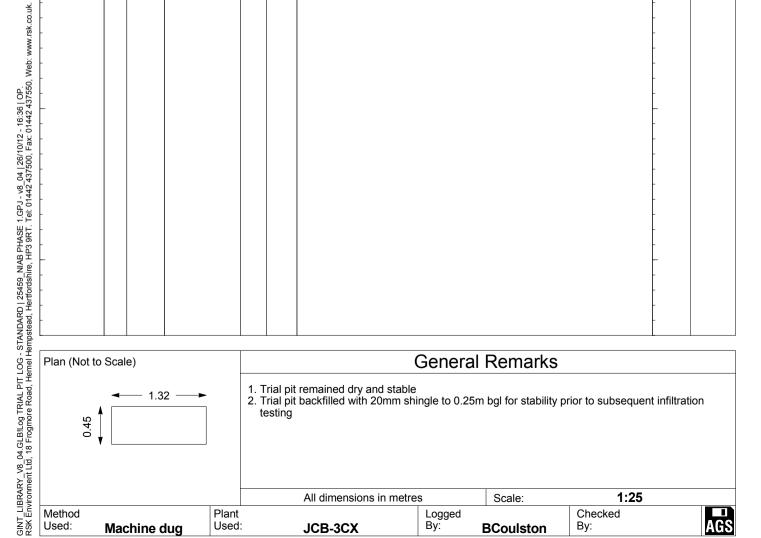


Contract:						Client:		Trial P	it:	
		NIAE	B - Phase 1			BD\	N Trading Limited			TP7
Contract Re	f:		Date:		Gro	und Level (m AOD):	National Grid Co-ordinate:	Sheet:		
	254	.59		30.08.1	2	19.05	E:543650.0 N:260409.0		1	of 1
Samp	oles a	and In-si	tu Tests	ē					Depth	
Depth	No	Туре	Results	Water			Description of Strata		(Thick ness)	Legend
0.20-0.30	1	ES			sa Gi sc	indy CLAY. Sand is f ravel is subangular to	rop remains over dark brown slightly gine to coarse (predominantly fine to mosubrounded fine to coarse flint. Hur Roots and rootlets throughout.	edium).	(0.50)	\(\frac{1}{2}\) \(\frac{1}\) \(\frac{1}{2}\) \(\frac{1}2\) \(\frac{1}2\) \(\frac{1}2\) \(\frac{1}2\) \(1
0.50		V	c _u =69		su	bangular to subrour	andy CLAY with traces of fine to randed flint and chert. Occasional fine		- 0.00	
0.70 0.70	2	ES D				roughout. IVER TERRACE DEF	POSITS)		(0.50)	
-4.00		.,	00		_		II OLAY O. 1		1.00	
1.00		V	c _u =99		(p	redominantly mediur	ery gravelly CLAY. Sand is fine to m to coarse). Gravel is subangu coarse flint. Occasional subrounded o	ular to	(0.30)	
2.00	5	D			of gr (R) Oi m (p) su (R) er ca sp St sa er	flint. Rare inclusions avel-sized putty chalk IVER TERRACE DEF rangey-brown sandy edium to coarse. Gravedominantly mediur brounded cobbles of IVER TERRACE DEF @ 1.80m to 2.0m Ficountered as predoilcareous nodular graveckling and orange si iff pale grey silty CL	s of chalk, predominantly as fine to reconstruction. POSITS) clayey GRAVEL. Sand is predominantly is subangular to subrounded fine to mean to coarse) flint and chert. Occupint. POSITS) dorizon of Off-white/grey calcareous meminantly medium to coarse medium avels with clay/silt matrix. Occasionally inclusions. AY with occasional orange inclusions fissures. Occasional calcareous incluming in thickness.	nedium ninantly coarse asional odules, density I black of fine	2.00	
3.00	6	D V	c _u =>130						3.10	X X

Plan (Not to Scale)		General Remarks	
2.20	1. Trial pit dry and stable 2. CBR at 0.5m: 9% 3. CBR at 0.9m: 9%		
	All dimensions in metre	s Scale:	1:25
Method Used: Machine dug Plar		Logged By: BCoulston	Checked By: AGS



												KI.				J
Contract:				_			CI	lient:				_	Tr	ial Pit		
		NIAB	- Ph							/ Trading					Т	P7 (i)
Contract Re	ef:			Date:			Ground L	_evel (m A	AOD):	National Gri	d Co-ordin	ate:	Sh	neet:		
	254	59			29.08	.12		12.54		E:5439	55.0 N:	261102	2.0		1	of 1
Sam Depth	ples a	nd In-si Type		sults	Water	Backfill			Г	Description o	of Strata				Depth (Thick ness)	Material Graphic Legend
0.20	1 2	ES D					silty TO	DPSOIL. ular to s fragments	Sand is ubround	op remains predominar ed fine to r posing orga	ntly fine to nedium flir	medium nt gravel.	. Traces Occasio	of onal	(0.35)	1/ · 2 · 1/ · 2 · 1/ · 1/ · 2 · 1/ · 3 · 1/ · 1/ · 2 · 1/ · 3 · 1/
0.50		V	C _u =	=58			Firm b sandy coarse)	rown, be	Sand is is predon	orangey-bro fine to coa ninantly suba	rse (predo	minantly	ntly grav medium	relly to	(0.75)	
1.20		V	C _u =	=75			coarse	ale grey, (GAULT T FORMA	FORMA	orangey-brov ΓΙΟΝ).	vn sandy (CLAY. Sa	nd is fine	e to	1.10	
-									,					-		
-														-	- - -	
-														-		
-														-	-	
-																





Contract:						Client:		Trial P	it:	
		NIAB	- Phase 1			BDV	W Trading Limited			TP8
Contract Re	f:		Date:		Gr	ound Level (m AOD):	National Grid Co-ordinate:	Sheet:		
	254	59		30.08.	12	19.05	E:543650.0 N:260490.0		1	of 1
	1		tu Tests	Water	Васкт		Description of Strata		Depth (Thick	Graphic
Depth	No	Туре	Results	>			rop remains over dark brown slightly		ness)	Legend
0.10-0.20	1	ES			G	Fravel is subangular to	ne to coarse (predominantly fine to mosubrounded fine to coarse flint. Hur Roots and rootlets throughout.		0.30)	17 · 24 · 14 · 14 · 17 24 · 15 · 14 · 15 · 14
0.30-0.40	2	D				ГОРSOIL) Prangey-brown gravelly	very clayey SAND. Gravel is subang	gular to	0.50	
0.50 0.50	3	ES V	c _u =55		s fl	ubrounded fine to coa	arse flint. Occasional subrounded cob throughout. Occasional decomposing	bles of		
0.70	4	D			(F	RIVER TERRACE DEF	POSITS) andy gravelly CLAY. Sand is fine to	coarse	(0.50)	<u> </u>
-					(t }	predominantly mediur ubrounded fine to coa	n to coarse). Gravel is subanguarse flint. Occasional subrounded cob	ular to	1.00	
1.20	5	D			\(I	int. RIVER TERRACE DEF			_	0. 6
-					to (p	ight brown/orange/yello subrounded fine for predominantly medium RIVER TERRACE DEF		angular coarse	-	0.0
-						.@ 1.2m Becoming a v	ery sandy GRAVEL		(1.30)	:
2.00	6	D				.@ 1.9m Becoming a g	ravelly SAND		-	
					F	irm to stiff orangev-hr	own/grey very sandy gravelly CLAY.	Sand is	2.30	
2.50 2.50	7	D V	c _u =72		it () W	ne to coarse. Gravel	is subangular to subrounded fine to medium) flint and subangular fine to r	coarse	(0.70)	
_									3.00	
-									- - - -	
-									- -	
_									-	

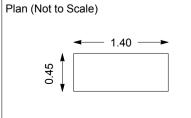
Plan (Not to Scale)	General Remarks								
2.20	1. Trial pit dry and stable 2. CBR at 0.3m: 4% 3. CBR at 0.8m: 6%								
	All dimensions in metre	s Scale:	1:25						
Method Used: Machine dug		Logged By: BCoulston	Checked By: AGS						



Contract:							Client:		Т	rial Pit	<u>.</u>	
		NIAB	- Phas	se 1				W Trading Limited	I			P8 (i)
Contract Re	f:			Date:		Grour	nd Level (m AOD):			Sheet:		- ()
	254	.59		2	9.08.12		12.22	E:544175.0 N:2	261116.0		1	of 1
Samp	oles a	and In-si	tu Tests		e er				•		Depth	Material
Depth	No	Туре	Resu	Its	Water			Description of Strata			(Thick ness)	Graphic Legend
0.10	1	ES			TOPSOIL: Harvested crop remains over dark brown slightly sandy silty TOPSOIL. Sand is predominantly fine to medium. Traces of subangular to subrounded fine to medium flint gravel. Occasional woody fragments. Decomposing organic matter and roots throughout. (TOPSOIL) Firm orangey-brown slightly gravelly sandy CLAY. Sand is fine to							1/2 · 5/4 · 1/2 · 5/4 · 1/2 · 5/4 · 1/2 · 5/4 · 1/2 · 5/4 · 1/2 · 5/4 · 1/2 · 5/4 ·
0.50	2	V ES	c _u =5	7		coai	coarse (predominantly fine to medium). Gravel is predominantly subangular fine flint. (RIVER TERRACE DEPOSITS)					
-						@	0.65m Increase in	n sand and gravel constitue	ents		0.95	
						coai subi chei	rse (predominantly rounded fine to co rt.	y clayey very sandy GRA y medium to coarse). Gra parse (predominantly fine	ivel is subangula	ar to	(0.45)	
						\(RIV	/ER TERRACE DE	EPOSITS)			1.40	J —V — €

Method

Used:



Machine dug

Plant

Used:

General Remarks

1. Trial pit remained stable

 Slow water seepage at base on completion.
 Trial pit backfilled with 20mm shingle to 0.45m bgl for stability prior to subsequent infiltration testing

All dimensions in metres	Scale:	1:25

Logged By:

JCB-3CX

Checked Ву: **BCoulston**

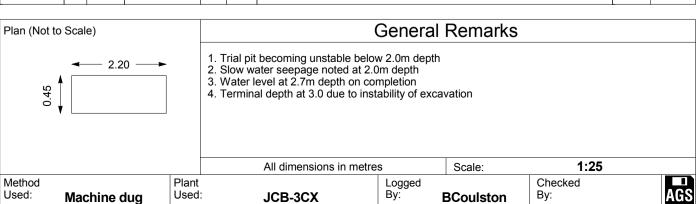
SIC





Contract:								Client:			Trial Pit:		
	NIAB - Phase 1								BDW Trading Limited			TP9	
Contract Re	Contract Ref: Date						Grour	d Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459 31.08.12						8.12		18.17	E:543730.0 N:260478.0		1	of 1	
Sam	oles a	and In-si	tu Tests	3	ater	Backfill				Depth	Materia Graphic		
Depth	No	Туре	Res	sults	×	Вас			Description of Strata		(Thick ness)	Legend	
							TOP	SOIL: Harvested of	rop remains over dark brown sandy	slightly		7,1%	

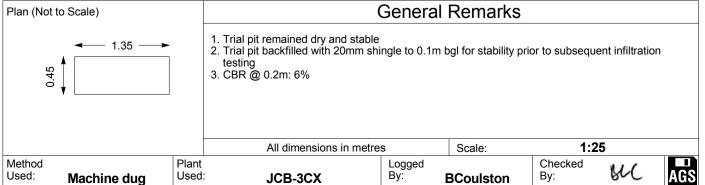
Samp	les a	nd In-si	tu Tests	ter	ξĘ.	Description of Otroto	Depth	Material
Depth	No	Туре	Results	Water	Backfill	Description of Strata	ness)	Graphic Legend
0.10-0.20	1	ES				TOPSOIL: Harvested crop remains over dark brown sandy slightly gravelly clayey TOPSOIL. Sand is predominantly fine to medium. Gravel is subangular to subrounded fine to medium flint. Roots, rootlets and decomposing organic matter throughout. Rare subangular fine chalk clasts. (TOPSOIL)	0.25	\(\frac{1}{2}\), \(\frac{1}\), \(\frac{1}{2}\), \(\frac{1}\), \(\frac{1}{2
- 0.55 _ 0.60	2	V ES	c _u =66			Firm orangey-brown slightly gravelly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse flint. Roots noted throughout. (RIVER TERRACE DEPOSITS)	0.80	
- 1.00 -	4	D				Light brown/orangey-brown gravelly SAND. Gravel is subangular to subrounded fine to coarse flint. Sand is fine to coarse (predominantly medium to coarse). (RIVER TERRACE DEPOSITS)	-	0.00
- - 1.50 -	3	ES					-(1.80)	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
- 2.00 - -	5	D				@ 2.0m Increase in gravel content, becoming a SAND and GRAVEL	-	0.0
3.00	6	D				Brown/grey/orangey-brown sandy GRAVEL. Sand is fine to coarse. Gravel is fine to coarse (predominantly fine to medium). Occasional subrounded cobbles of flint. (RIVER TERRACE DEPOSITS)	2.60	
-							-	



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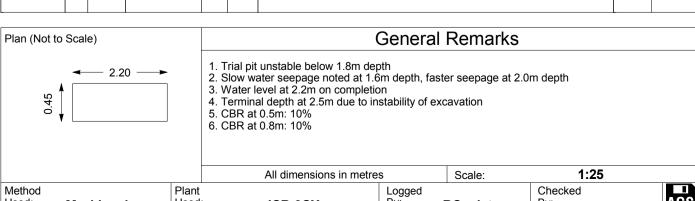


Contract:						Client:		Trial Pi	t:	
		NIAB	- Phas	e 1			N Trading Limited			P9 (i)
Contract Re	ef:		Da	ate:		Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:		
	254	59		29.0	08.12	12.28	E:544181.0 N:261357.0		1	of 1
	1		tu Tests	Water	Backfill		Description of Strata		Depth (Thick	Material Graphic
Depth	No	Туре	Result	s ≥	Be		•		ness)	Legend
0.20	1	ES			TOPSOIL: Harvested crop remains over dark brown sandy silty clayey TOPSOIL with traces of subangular to subrounded fine to medium flint. Humic-rich horizon to 0.1m bgl. Rootlets and inclusions of decomposing organic matter throughout. (TOPSOIL) Firm orangey-brown, occasionally mottled with pale grey, sandy gravelly CLAY. Sand is fine to coarse (predominantly fine to medium).					
0.50 0.50	3	D V	c _u =65			(0.33) 0.70				
0.70	2	ES				(RIVER TERRACE DEF Orangey-brown slightly subrounded fine to coa	gular to t. Sand	(0.45)		
0.90	0.90 4 D					is predominantly mediur (RIVER TERRACE DEF	n. POSITS)		1.15	





Contract:							C	Client:		Tr	rial Pit:		
		NIAB	- Pha	ase 1				BD	W Trading Lim	ited			TP10
Contract Re	f:			Date:			Ground	Level (m AOD):	National Grid Co-o	rdinate: St	heet:		
	254	59			30.0	8.12		18.76	E:543519.0	N:260729.0	1	(of 1
Samp	les a	and In-si	tu Tests	;	ter	Kfill			5		Dep		Material
Depth	No	Туре	Res	ults	Water	Backfill			Description of Strate	a	(Th		Graphic Legend
0.20	1	ES					over date to coa	ark brown slight irse. Gravel is s -rich soil noted t c matter through	hrub vegetation and y gravelly sandy claye ubangular to subroun o 0.1m depth. Roots/r out.	ey TOPSOIL. Sand is ded fine to medium f	fine lint. 0.2		1/ 1/ 1/ 1/ 1/ 1/ 1/ 1/ 1/ 1/ 1/ 1/ 1/ 1
0.50 0.50	2	ES V	c _u =	·51			Firm of coarse	e to 0.6	0	<u></u>			
1.00	3	D					Orango coarse subrou cobble (RIVEF @ 1.	e (predominantly unded fine to co es of flint. R TERRACE DE .0m Becoming a	slightly clayey sandy (medium to coarse). parse flint and chert.	Gravel is subangular	r to L	00)	
2.50	5	D									2.5	60	
-											-		



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Used: Machine dug

Used:

JCB-3CX

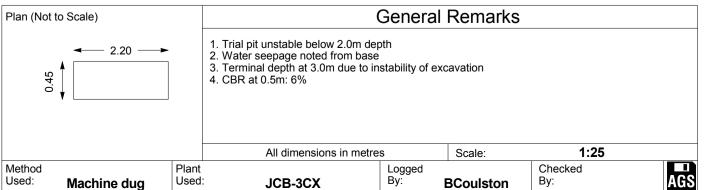
Logged By:

Ву: **BCoulston**



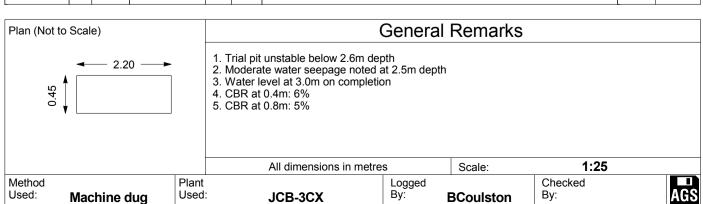
Contract:								Client:					Trial Pi	t:	
		NIAB	- Pha	ase 1			BDW Trading Limited Ground Level (m AOD): National Grid Co-ordinate: Si								TP11
Contract Re	f:			Date:			Grour	nd Level (m A	(OD):	National Grid C	o-ordinate:		Sheet:		
	254	.59			30.08	8.12		18.82		E:543585	.0 N:2606	74.0		1	of 1
		and In-si		sults	Water	Backfill				Description of S	trata			Depth (Thick	Graphic
0.10-0.20	No 1	Type	Nes	Suits		Ш	rema suba Occ	ains over da angular to si	ark brov ubrounde o mediur	rise shrub veg wn silty very s ed fine to coar m fragments of o	sandy CLAY se flint, brick	with trac	es of	(0.30) 0.30	Legend
0.50-0.60	2	ES					Grav med	vel is suban	gular to e) flint. C	ndy gravelly CL, subrounded fir Dccasional subro	ne to coarse	(predomi	parse. nantly	-	-20- 00
- 0.75 - - 1.00	3	D V	c =	=63			,			,				(0.90) - -	00.0
- 1.00		V	O _u -	-03			Orangey-brown/light brown clayey gravelly SAND. Gravel is subangular to subrounded fine to coarse flint and chert.								0-80-
1.50	4	D					suba		brounde	d fine to coarse			ei 15	- - - - (0.80) -	
2.20	5	D					GRA (predof fli	AVEL. Sand dominantly fi	is find ne to me	ht brown very e to coarse. edium) flint. Occ OSITS)	Gravel is f	ine to c	oarse	2.00	
3.00	6	D					cobb	bles of flint. 2.6m Slight i	increase	sandy GRAVE in clay content to coarse flint of		nal subrou	unded	3.00	0.000 0.000 0.000 0.000







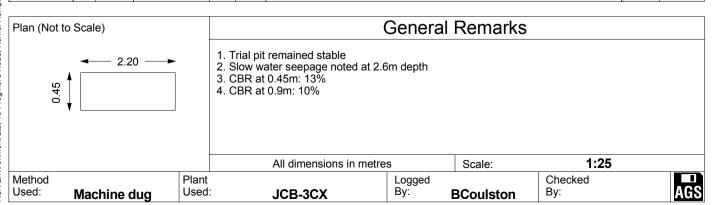
Contract:							Client:		Trial P	it:	
		NIAB	B - Phase '	1			BD'	W Trading Limited			TP12
Contract Re	f:		Date:			Grour	nd Level (m AOD):	National Grid Co-ordinate:	Sheet		
	254	59		31.08	.12		18.29	E:543723.0 N:26056	0.0	1	of 1
Samp Depth	les a	ind In-si	tu Tests Results	Water	Backfill			Description of Strata		Depth (Thick ness)	
0.20-0.30	1	ES				clay Roo	ey TOPSOIL with	crop remains over dark brow traces of subangular fine to emposing organic matter through	medium flint.	-(0.40)	\(\frac{1}{2}\), \(\frac{1}\), \(\frac{1}\), \(\frac{1}{2}\), \(\frac{1}{2
0.50	2	V ES	c _u =51			Firm coar subr flint. (RIV	(0.90)				
1.00	3	D V	c _u =67				1.30	0-0-0			
1.50 1.50 1.50 - 1.50	4 5	ES D V	c _u =123			Firm Grav Occi lens (RIV	(0.50)	X X			
- - -						med		y clayey SAND. Gravel is predon redominantly medium to coarse. POSITS)	ninantly fine to	-(0.40) -2.20	
-						is f subr				(0.45)	0
3.00	6	ES				is p	predominantly med	own slightly clayey SAND and G dium to coarse. Gravel is s ntly medium to coarse flint. POSITS)		- 2.65 - - - (0.55) - -	
-										3.20	8 · · · · · · · · · · · · · · · · · · ·



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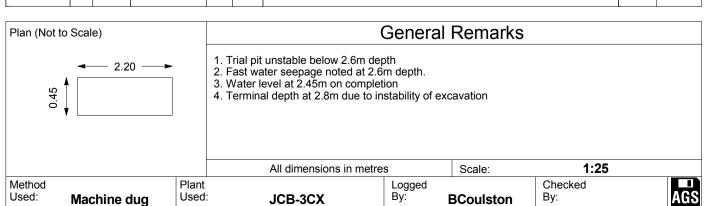
Contract:								Client:					 Frial Pit	- 	
Contracts		NIAE	B - Pha	ise 1				Oliona.	BDV	V Trading	Limited			•	TP13
Contract Ref	f:			Date:			Grou	nd Level (m		National Grid		S	Sheet:		
	254	59			30.0	8.12		18.44	ļ	E:54366	3.0 N:260	659.0		1	of 1
Samp	les a	and In-si	itu Tests		ter	Kfill								Depth	
Depth	No	Туре	Resi	ults	Water	Backfill				Description of	Strata			(Thick ness)	Graphic Legend
0.20-0.30	1	ES					over pred fine	r dark bro dominantly to medi	wn slightl fine to n ium flint.	rub vegetation y gravelly san nedium. Grave Humic-rich mposing organi	dy clayey TOI I is predomina soil noted to	PSOIL. Sar antly subanç o 0.2m de	nd is gular	(0.45)	\$\frac{1}{2} \cdot \frac{1}{2}
0.50		V	C _u =4	49			Gra	vel is sub	angular to	ndy gravelly Cosubrounded	fine to coarse	(predomina	arse. antly	0.65	0000
0.70-0.80	2	ES					Ora pred fine	ngey-browi dominantly	n slightly medium to (predomin	Occasional sub clayey very o coarse. Grave antly fine to me OSITS)	sandy GRA el is subangula	VEL. San	d is nded	0.00	
-								: 1.2m Rec vel constitu		sand content.	Increase in mo	edium to co	ŀ	(1.70)	
-							@	1.6m Incre	ease in cla	ay content				2.35	
2.50 - 2.50 							pred fine	dominantly	fine to m low dens	y sandy sligh nedium. Gravel ity calcareous r	is subangular	CLAY. San r to subrour	id is nded	(0.65)	
-														3.00	



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Contract:								Client:			Trial P	it:	
		NIAB	- Pha	ise 1					BDW	/ Trading Limited	111611		TP14
Contract Re	f:			Date:			Groun	nd Level (m AC	DD):	National Grid Co-ordinate:	Sheet:		
	254	59			30.08	8.12		17.93		E:543655.0 N:260732	2.0	1	of 1
Samp	oles a	ınd In-si	tu Tests		ter	kfill						Depth	
Depth	No	Туре	Res	ults	Water	Backfill			L	Description of Strata		(Thick ness)	Legend
0.10-0.20	1 2	ES D					over pred fine Root (TOI	dark brown dominantly fine to medium ts/rootlets and PSOIL)	slightly to me flint. decom	ub vegetation and harvested control of the control	IL. Sand is subangular .2m depth. it.	(0.55)	\$\frac{1}{2} \cdot \frac{1}{2}
0.60	3	ES					Grav med		ular to) flint.	dy gravelly CLAY. Sand is fine subrounded fine to coarse (pr		(0.45)	
1.00	4	D					suba (RIV	angular to subr ER TERRACE	rounde E DEP(nd GRAVEL. Sand is fine to coars d fine to coarse flint. DSITS) dium to coarse gravel constituen		-(1.80)	
-												2.80	
-												-	



GINT_LIBRARY_V8_04.GLBILog TRIAL PIT LOG - STANDARD | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 16:37 | OP.
RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442437500, Fax: 01442437550, Web: www.rsk.co.uk.



Contract:		Client:		Trial Pit	t:	
NIAB - Phase 1		BDV	V Trading Limited			TP15
Contract Ref: Date:		Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:		
25459	31.08.12	17.21	E:543755.0 N:260662.0		1	of 1
Samples and In-situ Tests	_ e ≡				Depth	
Depth No Type Results	Water		Description of Strata		(Thick ness)	Legend
0.10 1 ES		clayey TOPSOIL with	crop remains over dark brown silty traces of subangular fine to medium mposing organic matter throughout.	sandy m flint.	(0.30)	\(\frac{1}{2}\)\cdot \(1
0.50-0.60 2 ES V c _u =52		Firm light brown/orange coarse (predominantly subrounded fine to coaflint.	ular to	(0.50)		
1.00 3 D V c _u =96		@ 0.5m Increase in fir Firm to stiff pale grey s coarse. Gravel is predo rare calcareous nodules (GAULT FORMATION)		0.80		
2.00 4 D V c _u =>130			slightly sandy silty CLAY. Sand i ular claystone clasts. Occasional cald		2.10	
3.00 6 D C _u =>130					3.20	X X X X X X X X X X X X X X X X X X X

General Remarks

Scale:

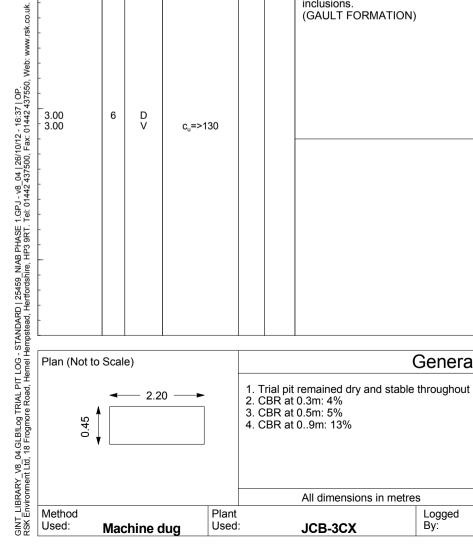
BCoulston

Logged By:

1:25

Checked

Ву:





DRAFT

(0.70)

2.40

Contract:								Client:	•	TRIAL	PI [*]		.OG
Contract		NIAD	B - Pha	360 1					V Tradina Limite	nd	marPi	ıt.	TP16
Contract Re	of.	INIAD) - File	Date:			Groun	Id Level (m AOD):	V Trading Limite National Grid Co-ordi		Sheet:		1710
Contract Re			Date.			Gioui				Sileet.		
	254	159			31.0	8.12		17.10	E:543801.0 N	:260622.0		1	of 1
Sam	ples a	and In-si	itu Tests	3	ter	Backfill						Depth	Materia
Depth	No	Туре	Res	sults	Water	Bac			Description of Strata			(Thick ness)	Graphic Legend
_									crop remains over da				7/ 1/V
0.15-0.25	clayey TOPSOIL with traces of subangular fine to medium flir Roots/rootlets and decomposing organic matter throughout.								n tiint.	(0.30)	$\frac{1}{\sqrt{1 \cdot \lambda_1 \cdot \lambda_2}} \cdot \frac{1}{\sqrt{4 \cdot \lambda_2}}$		
-	(TOPSOIL)								poog o.gaoao	an oughout		0.30	<u>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</u>
-							Firm	light brown/orang	ey-brown sandy gra	velly CLAY. Sa	and is	-	-0
0.50	2	D							edium. Gravel is sub- ccasional coarse gra			_	50.
0.50	-	V	c _u =	5 7			subr	ounded flint.	ū		0.204	-	0:-0
							(RIV	ER TERRACE DEP	OSITS)			-	<u> </u>
												(1.05)	Ö
Ĺ													7.0.
1.00 1.00	3	D V		-67									0
1.00		V	C _u =	-07								-	-0-5-
-												1.35	<u>~~~</u>
-									ravelly SAND. Grav			-	
-							suba	0	ed fine to medium fli	nt. Sand is med	ium to	(0.35)	
-								SE. ER TERRACE DEP	OSITS)			1.70	.0.0
									ndy GRAVEL. Sand is				0,0,00
_									ominantly subangular subrounded cobbles of		tine to	-	0000
	١.							ER TERRACE DEP				(0.70)	6.500

...@ 2.1m Increase in sand content to a very gravelly SAND

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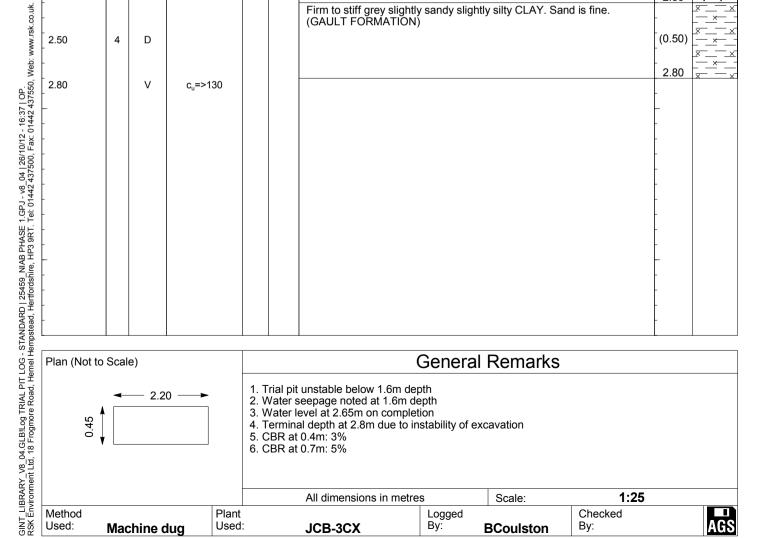
2.00

D

Plan (Not	to Scale)			Genera	al Remarks		
0.45	2.20	7	1. Trial pit unstable below 1.6r 2. Fast water seepage noted a 3. Water level at 1.8m on com 4. Terminal depth at 2.4m due 5. CBR at 0.5m: 5%	at 1.6m depth pletion	excavation		
			All dimensions in r	netres	Scale:	1:25	
Method Used:	Machine dug	Plant Used:	JCB-3CX	Logged By:	BCoulston	Checked By:	AGS

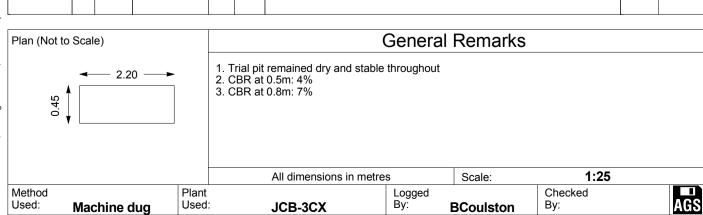


Contract:							(Client:						Trial Pi	t:		
		NIAB	- Ph	ase 1					BDV	V Tradin	g Limi	ted				T	217
Contract Ref	f:			Date:			Ground	Level (m AOD):	National G	rid Co-or	dinate:		Sheet:			
	254	59			31.0	8.12		17.3	5	E:543	856.0 N	N:2605	94.0		1	of	1
Samp	les a	and In-si		sults	Water	Backfill				Description	of Strata				Depth (Thick	Gı	aterial aphic egend
Берш	INO	Туре	110	buito	_		TOPS	SOIL : La	w-rise sh	rub vegetat	ion and I	narveste	d cron	remains	ness)		<u>.√./.</u> ;
0.10-0.20	1	ES					over (predo	dark br ominantl	rown sand y fine to m	ly gravelly nedium). Gra quent roots/	CLAY. Savel is su	and is bangular	fine to	coarse	(0.30) 0.30		1.1, 1.1,
_							matter (TOPS	r througl SOIL)	hout.						-		
0.50	2	V ES	C _u =	- 56			Sand subroi	is pred unded es-sized	dominantly		edium. G	ravel is	subang	gular to	(0.90)		
1.00		V	C _u =	- 69			@0	.5m Inc	rease in sa	nd content					1.20		· · · ·
1.50	3	D					suban	igular to es of flin	subrounde	GRAVEL. Sed fine to co					1.20 - - - - - - - - -	0.0.0.0.0.0.000	
							Firm t	o stiff ar	ov eliabtly	sandy slight	lly cilty CI	AV San	d is fina		2.30	× O	 × ∂. о
2.50	4	D							MATION)	sandy silgin	lly Silly GL	AT. Sali	u is iiile.	•	[(0.50)	× .	× × ×
2.80		V	C _u =	- 130											2.80	×	× ×
-															- - - - -		





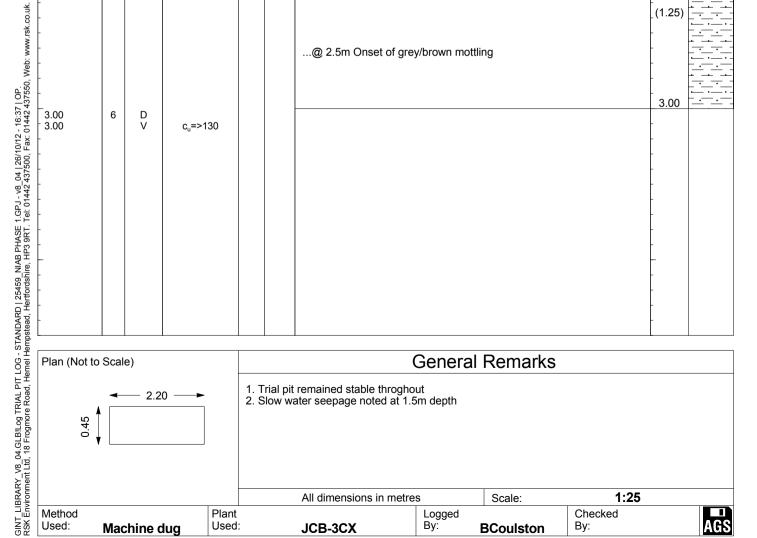
Contract:								Client:					Trial Pi	t:	
		NIAB	- Pha	ase 1					BDW	/ Trading	Limite	d			TP18
Contract Re	f:			Date:			Groun	d Level (m A	OD):	National Gri	d Co-ordina	ate:	Sheet:		
	254	59			31.0	8.12		17.17		E:5439	20.0 N:2	260525.0	0	1	of 1
Samp	les a	and In-si	tu Tests	;	ter	Kfill								Depth	
Depth	No	Туре	Res	sults	Water	Backfill				Description o	of Strata			(Thick ness)	Graphic Legend
0.10-0.20 0.15	1 2	D ES					coars (pred suba	DE GROUND se. Gravel dominantly fi ingular brick. Imposing orga	is sub ine to Occas	pangular to medium) f sional woody	subround lint. Rare fragments	ed fine t fragments	to coarse s of fine	_ (0.35) - 0.35	
0.50 0.50	3	ES V	c _u =	- 71			(MAI Firm pred	DE GROUND orangey-bro ominantly find	own s e to me	lightly sand	dy gravell	y CLAY. ngular to su	Sand is ubrounded	(0.45)	
_								to coarse flint ER TERRAC		OSITS)			_	0.80	
-							Firm suba calca	pale grey sai ingular to sub areous inclusi ER TERRAC	ndy gra brounde ions and	velly CLAY. d fine to coad occasional	arse flint a	nd chalk. C	Occasional	- - - (0.80) -	
1.50	4	D V		120										1.60	
1.50		V	C _u =>	130			(pred	ngey-brown o dominantly mo se flint.	edium t	o coarse). C				(0.30)	
_							(RIV	ER TERRAC	E DEPO	OSITS)			Г	1.90	000
-							coars	1.6m Orang se (predomir ium to coarse	nántly r					(0.40)	
2.50	5	D					suba	pale grey sai ingular to sub areous inclusi ER TERRAC	brounde ions and	ed fine to coad d occasional	arse flint a	nd chalk. C	Occasional	2.30	x : x x : x
2.50		V	C _u =>	·130			Occa	to stiff pale gasional linear JLT FORMAT	calcare	ghtly silty slig ous inclusion	ghtly sandy ns.	CLAY. Sa	and is fine.	(0.70)	× × ×
_														3.00	<u>x x</u>
														-	
_														-	
_														-	
-														-	
-														- -	
_														_	



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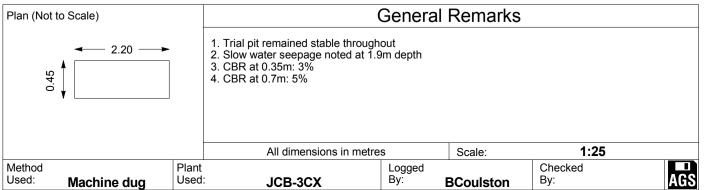
Contract:								Client:			Trial P	it:	
		NIAB	B - Pha	ase 1				В	3DV	V Trading Limited			TP19
Contract Re	f:			Date:			Ground	d Level (m AOI	D):	National Grid Co-ordinate:	Sheet:		
	254	59			31.08	3.12		17.42		E:543697.0 N:260767.0		1	of 1
Samp	oles a	and In-si	itu Tests	1	Water	Κ				D ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '		Depth	
Depth	No	Туре	Res	ults	×	Backfill				Description of Strata		(Thick ness)	Graphic Legend
0.10-0.20	1	ES					grave Grave subar Roots	elly CLAY. Sand el is predomi ngular fine clas	d is f inant sts o	ested crop remains over dark bror ine to coarse (predominantly fine to ly subangular fine to medium fli of brick. Humic-rich soils noted to 0. mposing organic matter throughout.	medium). nt. Rare	(0.45)	
0.50 - 0.50 - 0.60	3	D V ES	C _u =	:57			coars (pred (RIVE	is fine to coarse	(0.65)				
1.00	4	D					@(0.7m Becoming	g a ve	ery clayey SAND and GRAVEL			
1.00		V	C"=	106			Firm predofine to subro (RIVE	(0.65)	0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 : 0 :				
1.50 1.50	5	D V	C _u =>	130			@	1.4m Slight inci	rease	e in sand and gravel constituents		1.75	00.0
2.00		V	C _u =>	·130			Trace		ar fin	n blue silty slightly sandy CLAY. Sar e to medium claystone.	d is fine.	-	
-							@ 2	2.5m Onset of (grey/	brown mottling		3.00	
3.00	6	D V	C _u =>	130								-	





Contract:	ontract: NIAB - Phase 1												Trial Pi	t:	
		NIAB	- Pha	ase 1					BDV	/ Trading	Limited				TP20
Contract Re	f:			Date:			Grour	nd Level (m	n AOD):	National Grid	l Co-ordinat	e:	Sheet:		
	254	59			31.08	3.12		16.22		E:54370	07.0 N:20	60872.0		1	of 1
Samı	oles a	ınd In-si	tu Tests	5	ter	₩.				- · · ·				Depth	
Depth	No	Туре	Res	sults	Water	Backfill				Description of	Strata			(Thick ness)	Graphic Legend
0.20	1	ES					clay Roo	ey TOPS(ts/rootlets	OIL with and decor	op remains ov traces of su nposing organ	bangular fi iic matter th	ne to coars oughout.	sé flint.	_ _(0.35) - 0.35	1/2 - 3/2 -
0.40	2	V D	c _u =	= 66			med Occ	ium. Grav asional sul	el is sub prounded	ntly gravelly si angular to su cobbles of flin	ıbrounded f	ine to coars	se flint.	-	\$ \$
0.70	3	ES					(RIVER TERRACE DEPOSITS)@ 0.6m Increase in fine sand and silt content							-	Q.—, O. ×O
1.00		٧	c _u =	- 79			@	1.0m Beco	oming pale	grey with occ	casional incl	usions of ch	alk	- - (1.80) - - -	
2.00 2.00 2.00 2.00	4 5	ES D V	c"=>	> 130			Grey (pre subr flint.	//brown cl dominantly ounded fir	ayey SAl medium ne to coa	ery sandy very ND & GRAV to coarse rse flint. Occa	EL. Sand). Gravel	is fine to is subange	ular to	- 2.15 - (0.35)	
-							Firm of su	pale grey	ish blue si	Ity slightly sar	ndy CLAY. Se.	Sand is fine.	Traces	(0.50) - 3.00	x x xx
3.00 3.00 3.00	6 7	ES D V	C _u =>	- 130											x x







Contract:						Client:		Trial P	it:	
		NIAE	- Phase 1			BD\	N Trading Limited			TP21
Contract Re	f:		Date:		Gro	und Level (m AOD):	National Grid Co-ordinate:	Sheet:		
	254	159		31.08.1	2	15.88	E:543763.0 N:260814.0		1	of 1
			tu Tests	Water			Description of Strata		Depth (Thick	Graphic
Depth	No	Туре	Results	S d					ness)	Legend
0.20-0.30	1	ES			ov su de \(T	rer dark brown silty bangular to subroun ecomposing organic m OPSOIL)		ces of ets and	0.35	\(\frac{1}{1}\text{y} \cdot \frac{1}{1}\text{y} \cdot \frac{1}{1}\text
0.50-0.60 0.50	2	ES V	c _u =61		m flir	edium to coarse. Grav	very sandy CLAY. Sand is predor vel is subangular to subrounded fine to lets noted throughout.	ninantly coarse	(0.55)	
1.00	3	D V	c _u =83		ca ca dia	lbangular to subroun llcareous nodules. C	avelly CLAY. Sand is fine to coarse. G ded fine to coarse flint and fine to recasional fine to medium gravel-siz Occasional decomposing rootlets	medium ed soft	0.90	
1.50		V	c _u =>130		pr 	edominantly comprise	n in sand and gravel content. es chalk calcareous nodules (predominantly		[(1.10)	
2.50	4	ES			is O	rm to stiff fissured da fine and predominar ccasional linear calcal AULT FORMATION)	rk grey slightly sandy slightly silty CLA' ntly encountered as fine gravel-sized reous inclusions.	Y. Sand lenses.	(0.70)	- ° - X - X - X - X - X - X - X - X - X
2.50 - 2.50 - 2.50	5	D V	c _u =>130						2.70	xx
-									-	
-									-	

Method Used:	Machine dug	Plant Used:	JCB-3CX	Logged By:	BCoulston	Checked By:	AGS
			All dimensions in	metres	Scale:	1:25	
0.45							
	← 2.20 →	► 1. Tr	ial pit remained dry and	stable throughout			
Plan (Not	to Scale)			Genera	I Remarks		



Contract:							Client:				Trial Pi	it:	
		NIAE	- Phase	1				DW	Trading Limited				TP22
Contract Re	f:		Date			Grour	nd Level (m AOD)		National Grid Co-ordinate:		Sheet:		
	254	59		31.0	8.12		16.63		E:543817.0 N:260	762.0		1	of 1
Samp	oles a	and In-si	tu Tests	- Li	■						·	Depth	Material
Depth	No	Туре	Results	Water	Backfill				escription of Strata			(Thick ness)	Legend
0.10	1	ES				clay suba orga	ey TOPSOIL. Sa	and is medi	p vegetation over dark b s predominantly fine to mo um flint. Roots/rootlets a	edium. Tra	ices of	0.20	17 · 74 · 17 · 14 · 17
0.60	2	V D	c _u =81			med		is p of flin	CLAY with traces of su redominantly fine to med it.			(0.70)	
-						Grav	vel is subangul areous nodules.	lar to Occa	ndy gravelly CLAY. Sand is subrounded fine to m sional coarse gravel and co	nedium flir	nt and	0.90	00.00
1.20		V	c _u =>130				asional calcareou ULT FORMATIO		susions.			-	000
2.00	3	D V	c,=>130									(1.30)	00-0 00-0
2.20	4 5	ES D				of o	n fissured grey sil orange/light brown usions. ULT FORMATIO	n fine	AY. Occasional fine grave sand and silt. Occasional	l-sized inc linear calc	lusions areous	2.20	X X X X X X X X X X X X X X X X X X X
3.00		V	c _u =>130									(1.10)	X X X
-												3.30	x - x

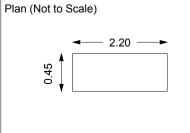
Plan (Not to Scale)		General Remarks	
2.20	Trial pit remained dry and stable	throughout	
	All dimensions in metre	s Scale:	1:25
Method Used: Machine dug Plan Used		Logged By: BCoulston	Checked By: AGS



Contract:							Client:		Trial P	it:	
		NIAB	- Phas	se 1			BD	W Trading Limited			TP23
Contract Re	f:		D	ate:		Gro	und Level (m AOD):	National Grid Co-ordinate:	Sheet:		
	254	.59		;	31.08.	12	14.94	E:544025.0 N:26065	9.0	1	of 1
Samp	les a	and In-si	tu Tests		e	Į I				Depth	
Depth	No	Туре	Resul	lts	Water	Backill		Description of Strata		(Thick ness)	Legend
0.20-0.30	1	ES	Tub+VL	_+J		su		n sandy silty clayey TOPSOIL w led fine to coarse flint	vith traces of	(0.40)	\(\frac{1}{2}\), \(\frac{1}\), \(\frac{1}\), \(\frac{1}{2}\), \(\frac{1}{2
0.50	2	D V	c _u =49			fin (R	e to medium. Fine ro IVER TERRACE DE	POSITS)	redominantly	0.40	
0.70-0.80	3	ES V	Tub+VL c _u =76				@ 0.6 m to 1.7 m Le	nse of sandy CLAY.		(0.90)	
_		-	-u · ·							1.30	
-						pre	ediominantly medium	y clayey slightly gravelly SAN . Gravel is subangular to subroungular cobbles of flint. POSITS)	ID. Sand is unded fine to	-	
2.00	5	D ES	Tub+VL	_+J			@ 2.0 m slight increa	ise in fine to medium subangular f	lint content.	-(1.80)	
-										3.10	-0-05
-										- - - - - - - -	

Method

Used:



Machine dug

Plant

Used:

General Remarks

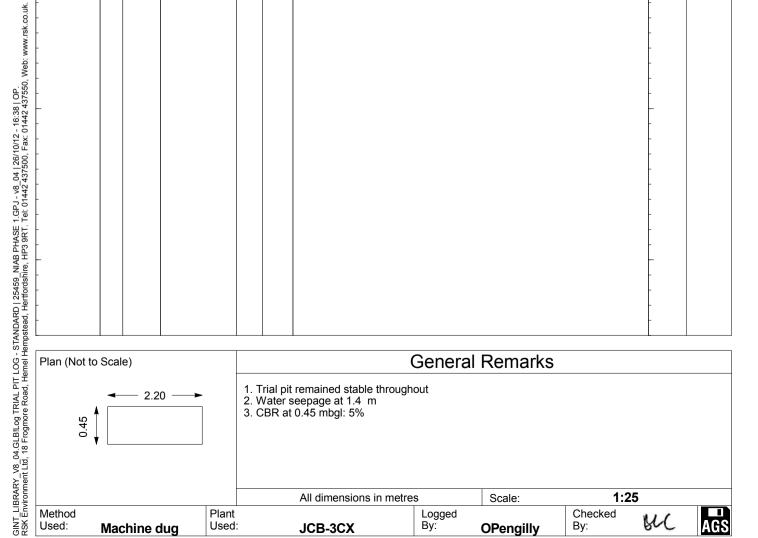
1. Trial pit terminated at 3.1 due to instability of pit 2. Slow water seepage at 2.0 mbgl

All dimensions in metre	3	Scale:	1:25

Logged By: JCB-3CX **OPengilly** Checked SIC Ву:

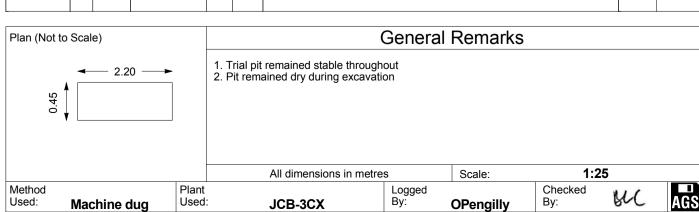


Contract:								Client:			Trial Pi	t:	
		NIAB	- Pha	ase 1						/ Trading Limited			TP24
Contract Re	f:			Date:			Grour	nd Level (m AC)D):	National Grid Co-ordinate:	Sheet:		
	254	59			03.0	9.12		13.89		E:543843.0 N:260966.0		1	of 1
Samp	oles a	and In-si	tu Tests	3	Water	Backfill				Description of Otroto			Material Graphic
Depth	No	Туре	Res	sults	Ma	Вас				Description of Strata		(Thick ness)	Legend
0.20-0.30	1	ES V		VL+J =56			CLA suba	Y. Sand is pre	edomir n to co	ested vegetation over dark brown san nantly fine to medium. Occasional and parse gravels of flint.	dy silty gular to	- - - (0.60) -	11 31 31 31 31 31 31 31 31 31 31 31 31 3
							h @	0 0 5 m cobble	d sizer	d roof-tiles found	Г	0.60	i,i,i,
_ 0.60 _ _ _ _ _ _	2	ES	Tub+	VL+J			Ligh coar pred fragi (RIV	torangey-broomse SAND. Godominanlty coaments of brick./ER TERRACE 1.0 onset of with gravels of the same same same same same same same sam	wn gra ravel arse fl DEPO	avelly angular fine to coarse predom is angular to subangular fine to c int with rare to occasional fine to	cobbled coarse ey silty	- - -(0.80) - - - - 1.40	





Contract:								Client:			Trial Pi	t:	
		NIAB	- Pha	ase 1				В	W Trading Li	mited			TP25
Contract Re	f:			Date:			Grour	nd Level (m AOD):	National Grid Co	-ordinate:	Sheet:		
	254	.59			03.09	9.12		13.03	E:544100.	0 N:260825.0		1	of 1
Samp Depth	les a	and In-si Type		sults	Water	Backfill			Description of Str	ata		Depth (Thick ness)	Material Graphic Legend
0.20	1 2	ES D		VL+J			silty coar \(TOI	sandy TOPSOIL, rse gravels of flint. PSOIL)	with occasional an	f dark brown clayey gular to subrounded	slightly fine to	- 0.25	1/ · ½ · / · / · · · · · · · · · · · · ·
0.40		V	c _u =	- 60			Firm (RIV	n orangey-brown s /ER TERRACE DI	andy CLAY. EPOSITS)			(0.40)	
-							coar	orangey-brown rse to cobbled siz rse angular to sub /ER TERRACE DI	ed pockets of sandy ounded flint.	with occasional to grey clay. Gravel is	some fine to	- 0.65 - - -	· · · · · · · · · · · · · · · · · · ·
1.10	3	D										(0.95) - -	0. 0 0. 0
-							Firm (GA	n to stiff grey sand ULT FORMATION	/ CLAY. I)			1.60 - -	
2.00	4	D										- - - (1.20) - -	
2.60		V	C _u =	:91								- - -	
												2.80	

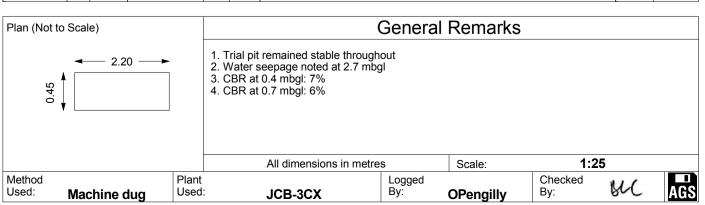


GINT_LIBRARY_V8_04.GLBILog TRIAL PIT LOG - STANDARD | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 16:38 | OP.
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Contract:			Client:		Trial Pi	t:		
NIAB -	Phase 1		BDV	V Trading Limited			TF	P26
Contract Ref:	Date:	Groun	nd Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	03.09.12		13.39	E:544048.0 N:260856.0		1	of	1
							\neg	

	2 54	.JJ		03.0	9.12	13.33		OT I
	_		tu Tests	Water	Backfill	Description of Strata	Depth (Thick	
Depth	No	Туре	Results	>	Ba	Boompton of ottata	ness)	
0.10-0.20 0.10-0.20 0.20-0.30	1 2 3	ES D ES	VL+J Tub			MADE GROUND: Harvested vegetation over dark brown slightly silty sandy clayey TOPSOIL, with occasional angular to rounded fine to coarse gravels of flint and chert. Sand is fine. (MADE GROUND)	(0.50)	
0.40		V	c _u =>130			@ 0.1m onset of orangey dark brown fine to medium sandy very mottled grey CLAY	0.50	
0.60	4	D				@ 0.3 m rare coarse ash and clinker Orangey brown to grey sandy CLAY with rare angular to subangular fine to medium gravels of flint and with medium pockets of dark organic matter. (RIVER TERRACE DEPOSITS)	-(1.00)	
- 4.50	_						1.50	
1.50	5	V V	c _u =80 c _u =80			Firm grey mottled with orangey-brown CLAY. (RIVER TERRACE DEPOSITS)	(1.10)	
- - - -						Orangey brown gravelly fine SAND. Gravel is angular to subangular fine to coarse flint and chert (RIVER TERRACE DEPOSITS). (RIVER TERRACE DEPOSITS)	(0.50)	0 0
-							- - - - - - - - -	

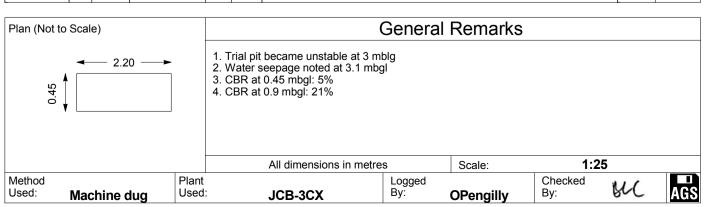


GINT_LIBRARY_V8_04.GLB!Log TRIAL PIT LOG - STANDARD | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 16:38 | OP.
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Contract:		Client:		Trial Pit	t:		
NIAB - Ph	ase 1	BD	N Trading Limited			TP	27
Contract Ref:	Date:	Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	03.09.12	13.15	E:543916.0 N:261033.0		1_	of	1
Samples and In-situ Test	Vater sackfill		Description of Strata			1	aphic

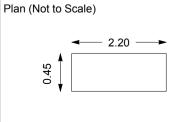
	254	.00		03.0	9.12	13.15 E.343310.0 N.201033.0	<u> </u>	OT I
Sam	ples a	and In-si	itu Tests	Water	Backfill	Description of Strata	Depth (Thick	Material Graphic
Depth	No	Туре	Results	M	Вас	Description of Strata	ness)	Legend
0.30	1	ES	Tub+VL+J			TOPSOIL: Harvested vegetation over slightly gravelly clayey sandy TOPSOIL. Gravel is angular to subangular fine to coarse flint. Sand is predominantly fine to medium. (TOPSOIL)	(0.45)	1/ · 2 · 1/ · 3 · 1/ 1/ · 2 · 1/ · 3 · 1/ · 1/ · 2 · 1/ · 3 · 1/ 1/ · 2 · 1/ · 3 · 1/
- 0.45 - 0.50	2	V D	c _u =59			Orangey-brown gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint.	0.45	
0.60	3	ES	Tub+VL+J			Pale grey-brown very sandy gravelly CLAY with medium to coarse chalk. Sand is predominantly fine to medium. Gravel is fine to coarse flint.	-	
0.90		٧	c _u =>130			(RIVER TERRACE DEPOSITS)	-	
1.50	4	D V	c _u =89			@ 1.30 to 1.50m Horizon of orangey-grey silty SAND with gravels of flint and chalk and with pockets of orangey brown mottled grey sandy clays.	(2.05)	
2.70 2.70	5	D V	c,=>130			Firm pale grey sandy silty CLAY. Sand is predominantly fine. (RIVER TERRACE DEPOSITS)	2.70	
-							(0.60)	× · · × · ·
-						@ 3.10 Onset of angular cobbles of flint and increased sand content.	3.30	× :- ×
-							-	



GINT_LIBRARY_V8_04.GLBILog TRIAL PIT LOG - STANDARD | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 16:38 | OP.
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Contract:						Client:		Trial P	it:	
		NIAB	- Phase 1			BD\	N Trading Limited			TP28
Contract Re	f:		Date:		Grou	und Level (m AOD):	National Grid Co-ordinate:	Sheet:		
	254	59		03.09.	12	12.53	E:544039.0 N:261022.0		1	of 1
Samp	oles a	and In-si	tu Tests	e					Depth	
Depth	No	Туре	Results	Water	Васк		Description of Strata		(Thick ness)	Legend
0.10 0.10-0.20	1 2	ES D	Tub+VL+J		TC pre	PPSOIL: Harvested voltage of the period of t	regetation over slightly gravelly clayey gular to subangular fine to coarse flint. edium.	/ sandy Sand is	(0.35) 0.35	\(\frac{1}{1}\frac{1}{2}\), \(\frac{1}{1}\frac{1}{2}\), \(\frac{1}{2}\), \(\frac{1}\), \(\frac{1}{2}\), \(\frac{1}\), \(\frac{1}{2}\), \(\frac{1}{2}\), \(\frac{1}{2}\), \(\frac
0.60		V	c _u =43		me	m orangey-brown sedium to coarse flints. VER TERRACE DEF		ounded	-	
1.00	3	D			(@ 1.0m Increase in s	and content.		-(1.35) - - - -	
									1.70	
-					gra	angey brown mediu avels of flint. IVER TERRACE DEF	m SAND with subrounded fine to r	medium	_	
2.00	4	D				@ 2.0m Increase in avel	subangular to subrounded fine to coa	rse flint	(0.70)	
-					me ∖ flin	edium. GRavel is and	brown SAND and GRAVEL. Sand is gular to subangular fine to cobbled graphosITS)	fine to avels of	2.40	
									- - - - - - - - - - -	



General Remarks

Trial pit unstable at 1.5 mbgl
 Water seepage noted at 1.7 mbgl
 Trial pit terminated at 2.6 mbgl due to instability

All dimensions in metres

Scale:

OPengilly

1:25

Method Used: Machine dug Plant Used:

JCB-3CX

Logged By:

Checked Ву:

SIC





Contract:							Client:		Trial P	it:	
		NIAB	- Phase	1				W Trading Limited			TP29
Contract Re	f:		Date	: :		Grour	nd Level (m AOD):	National Grid Co-ordinate:	Sheet:		
	254	59		03.09	9.12		12.53	E:544161.0 N:260984.0		1	of 1
			tu Tests	Water	Backfill			Description of Strata		(Thick	Material Graphic
Depth	No	Туре	Results	>	В					ness)	Legend
0.10-0.20	1	ES	Tub+VL+J			TOF pred (TO	PSOIL. Gravel is an dominantly fine to m PSOIL)		Sand is	(0.30)	
0.50	2	D				occa		ottled orange and dark brown sandy Cl ngular to subangular fine to medium flir		(0.70)	
_										1.00	
-						flint	n to stiff grey/brown and calcareous noo ULT FORMATION)		clasts of	-	xx
1.30		V	c _u =89			,	,			(0.60)	X
1.50	3	D								1.60	
2.00 2.00	4	ES V	J c _u =85			fine	n grey/brown mottle subangular calcare ULT FORMATION)	ed orange slightly sandy silty CLAY vous nodules. Sand is fine.	vith rare	- - - -	x x x x x x x x x x x x x x x x x x x
										(1.50)	x x x x x x x x x x x x x x x x x x x
3.00		V	c _u =62							3.10	× ×

General Remarks Plan (Not to Scale) 1. Trial pit remained dry and stable throughout excavation 2.20 -1:25 All dimensions in metres Scale: Logged By: Method Plant Checked Used: Used: Ву: Machine dug JCB-3CX **OPengilly**

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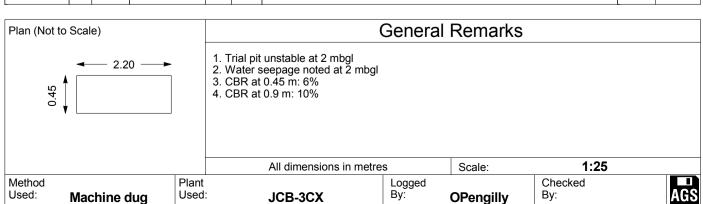


GINT_LIBRARY_V8_04.GLB!Log TRIAL PIT LOG - STANDARD | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 16:39 | OP. RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.uk.

DRAFT TRIAL PIT LOG

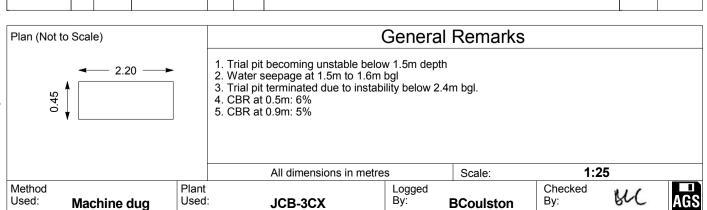
									1131			-00
Contract:								Client:		Tria	al Pit:	
		NIAB	- Ph	ase 1				BDV	V Trading Limited			TP30
Contract Re	f:			Date:			Grour	nd Level (m AOD):	National Grid Co-ordinate:	Sh	eet:	
	254	59			03.0	9.12		12.03	E:544023.0 N:26116	7.0	1	of 1
Samp	oles a	and In-si	tu Tests	3	ater	Backfill			Description of Strata		Depth (Thick	
Depth	No	Туре	Res	sults	8	Вас			Description of Strata		ness)	Legend
0.10-0.30 0.10-0.30	1 2	ES D	Tub+	-VL+J			sand		regetation over slightly gravelly el is angular to subangular fine to ne to medium.			1/2 · 2 ³ · 1/2 · 3 ³ · 1/2 ·

c_u=60 0.45 ٧ Firm grey / light orangey brown sandy CLAY with some fine to medium gravels of chalk and with occasional fine to medium gravels 0.65 of flint. Sand is predominantly fine to medium. Orangey-brown gravelly SAND with coarse gravel-sized pockets of brown mottled with grey sandy clay. Sand is predominantly fine. Gravels are angular to subangular fine to coarse flint. (0.55)(RIVER TERRACE DEPOSITS) ... @ 0.9 to 1.2 m lense of coarse sands and gravels 1.20 1.20 3 D Firm grey CLAY with traces of putty chalk and frequent lenses of sand and gravel. (RIVER TERRACE DEPOSITS) 1.50 ٧ $c_u = 97$ (1.00)2.00 4 D ... @ 2m Increase in sand content 2.20 2.20 c_u=70 Firm to stiff dark grey silty CLAY with rare to occasional fragments of calcareous nodules. (GAULT FORMATION) (0.80)3.00





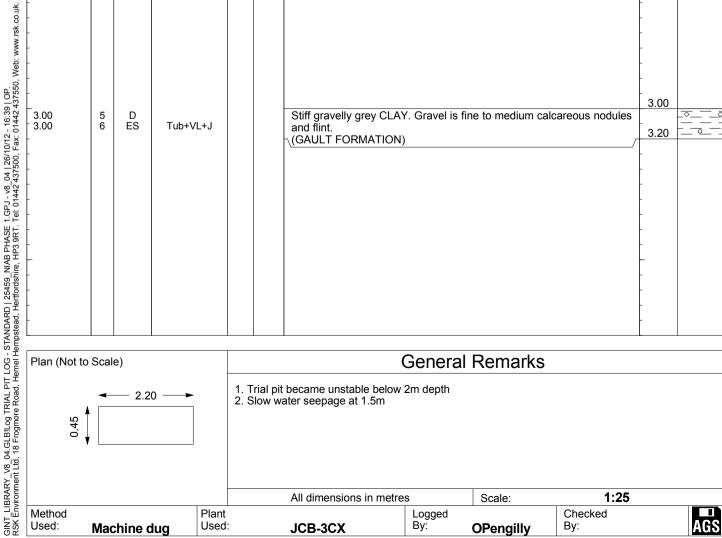
Contract:								Client:			Trial F	Pit:	
		NIAE	- Pha	ase 1				В	DW	/ Trading Limited			TP31
Contract Re	ef:			Date:			Groun	nd Level (m AOD):	National Grid Co-ordinate:	Sheet	•	
	254	59			03.09	9.12		12.03		E:544091.0 N:26114	12.0	1	of 1
	·	and In-si			Water	Backfill			[Description of Strata		Depth (Thick	Graphic
Depth	No	Туре	Res	sults	>	Δ.						ness)	Legend
0.10-0.20	1	ES	Tub+	VL+J			sand flint throu	dy very clayey To and with frequoughout.	OPS lent	getation and low shrub vegeta OIL with traces of subangular f rootlets and decomposing of	ine to medium rganic matter	(0.30)	17 · 34·19 · 34·19 · 34·19 · 34·19
0.50		V	C _u =	- 65			med Occ		sub mpc			-	
0.70-0.80 0.70 0.90	3	ES D V		VL+J				@ 0.7m Onset casional pale grey		fine to medium subangular ttling.	chalk clasts.	(0.90)	
		V	C _u =	104								1.20	
-							pred coar	dominantly medic	um. Iy fir	clayey SAND and GRAV Gravel is subangular to subro ne to medium) flint.		-(0.40)	
1.50	4	D					(KIV	ZER TERRACE I	JEF	J3113)		1.60	
-							SAN subr		e to of fli			-	0. 0.0 0. 0.0 0. 0.0
2.00	5	D					@	② 2.0m slight incr	ease	e in fine to medium gravel conte	ent.	(1.00)	000
-							@	2.2m Increase	in cla	ay content		-	0.000
-								2.5m Becomes nedium flint.	a ve	ery sandy GRAVEL. Gravel is s	ubangular fine	2.60	
-												-	
-													
-												-	
-												-	
-												-	



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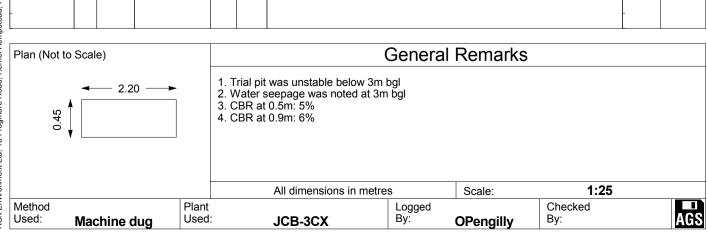


Contract:								Client:			Trial F	Pit:	
		NIAB	- Pha	ase 1				E	BDV	/ Trading Limited			TP32
Contract Re	f:			Date:			Groun	d Level (m AOI	D):	National Grid Co-ordinate:	Sheet	:	
	254	59			03.09	9.12		12.09		E:544055.0 N:2612	12.0	1	of 1
Samp Depth	les a		tu Tests Res		Water	Backfill			ı	Description of Strata		Depth (Thick ness)	
-						<u> </u>	sand		iravel	egetation over slightly grave is angular to subangular fine to medium.		0.25	24 1/2 . 34 1/2 . 34 1/2
0.30	2	ES D		VL+J			med	ngey brown sa ium gravels of k clasts.	andy flint	CLAY with angular to suba and with occasaional mediu	angular fine to m gravel sized	(0.35)	
0.50		V	c _u =	- 89			sand of m	nge and grey s ly clay. Sand is edium gravel si ER TERRACE	pred zed c		of orange very ccasional clasts		
1.00		V	c _u =	-67								-	
1.20	3	D								and GRAVEL. Sand is fi d fine to medium flint.	ne. Gravel is	1.20	
2.00	4 5 6	D D	Tub+	VL+J			@	ER TERRACE 2.1.8 Onset of s 2.0m Increase gravelly grey C	DEP	OSITS)	areous nodules	-(1.80)	
3.00	6	ES	Tub+	VL+J			and \(GAI	flint. JLT FORMATI	ON)			3.20	





Contract:						Client:			Trial P	it:	
		NIAB	- Phase 1				BDV	V Trading Limited			TP33
Contract Re	f:		Date:			Ground Level (I	m AOD):	National Grid Co-ordinate:	Sheet:		
	254	59		03.0	9.12	12.0	4	E:544183.0 N:261166.0		1	of 1
		1	tu Tests	Water	Backfill			Description of Strata		Depth (Thick	Graphic
Depth	No	Туре	Results	>	ш	TODSOIL: H	anyostad v	regetation over slightly gravelly clay	(O) / (OF) /	ness)	Legend
0.20	1	ES	Tub+VL+J				OIL. Grave	I is angular to subangular fine to coa		(0.45)	17.311, 37
_						Orangov grov	light brow	vn occasionally mottled with orange	, alayov	0.45	
-								kets of fine chalk.	: clayey	(0.45)	
- 0.85	2	D								0.90	
_0.90		V	c _u =68			Firm grey mo calcareous no (GAULT FOR	dules.	vn sandy, slightly silty CLAY with	frequent	-	x x x x x x x x
1.60		V	с _и =67							(1.30)	X X X X X X X X X X X X X X X X X X X
										-	X
2.50	3	D				Firm grey fiss (GAULT FOR	ured sandy MATION)	CLAY.		2.20	
- - - - -						inclusions		sandier matrix with occasional cal	careous	(1.30)	
3.50	4	ES	Tub+VL+J			\ @ 3.4 Tran	sitions to a	very clayey SAND.		-	



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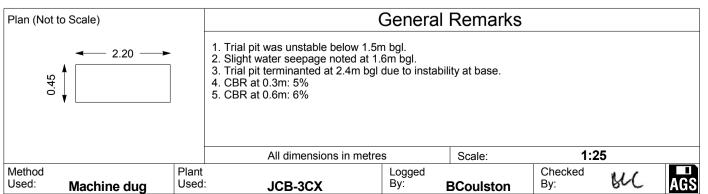


2.40

Contract:								Client:	TRIA	L PI		.OG
Contract.		ΝΙΔΕ	B - Ph	ase 1					V Trading Limited	IIIair	π.	TP34
Contract Re	ef:	1417 12		Date:			Groun	nd Level (m AOD):	National Grid Co-ordinate:	Sheet	:	11 0-1
	254	59			29.0	8.12		12.22	E:544116.0 N:261323.0	o	1	of 1
	·		itu Tests		Water	Backfill			Description of Strata		Depth (Thick	
Depth 0.20 0.40	1	Type ES V	Tub+	sults +VL+J =53	>	<u> </u>	angu clast deco (MA	ular to subrounded ts of pottery / omposing organic ma DE GROUND)		ubangular hout and	0.37	Legend
0.60	2 3	ES D		-VL+J			coar pred (RIV Orar subr flint.	se, predominantly rominantly fine to me ler TERRACE DEF ngey-brown clayey ounded fine to coa	OSITS) gravelly SAND. Gravel is subarse flint. Occasional subrounded on predominantly medium.	ubrounded ingular to	0.60	
1.50	4	D					Orar Grav	ngey brown / grey S	ne to medium gravel content. SAND and GRAVEL. Sand is fine subrounded fine to coarse flint. OSITS)	to coarse.	1.60	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
		_									(0.80)	

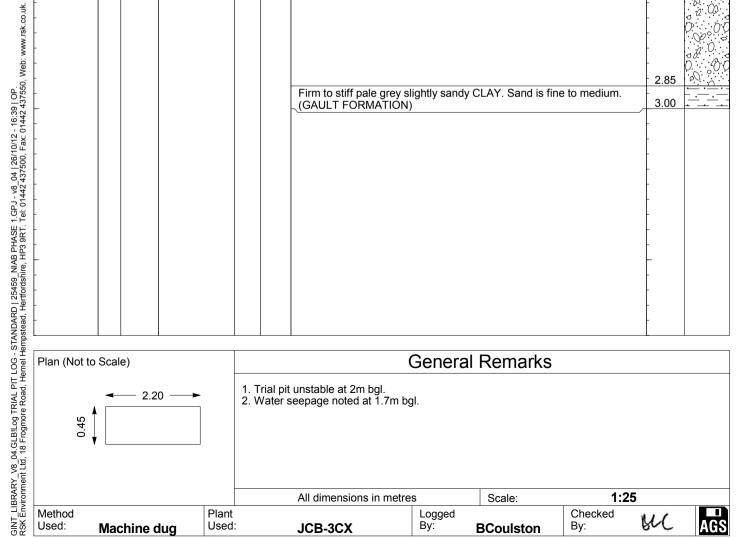
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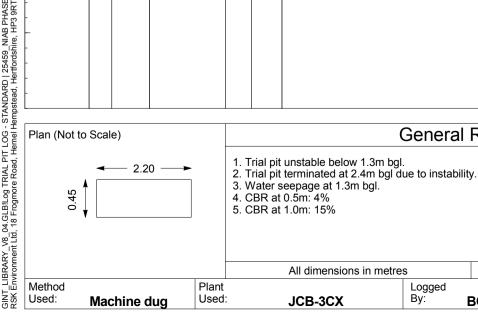


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Contract:								Client:						Tri	al Pi	t:	
		NIAB	- Pha	ase 1							rading l						TP35
Contract Re	f:			Date:			Grour		(m AOD):	Nat	tional Grid	Co-ordina	ite:	Sh	eet:		
	254	59			29.08	3.12		12.3	35	E	E:54426	2.0 N:2	261302	2.0		1	of 1
Samp	oles a	and In-si	tu Tests	1	Water	Backfill				Desc	cription of	Strata				Depth (Thick	
Depth	No	Туре	Res	ults	>	Ва				200	onpuon or v	onata				ness)	Legeno
0.10	1	ES	Tub+	VL+J			Sand subr	d is pre		fine	to mediu	ım. Grav	el is su	bangular	to	(0.45) - - 0.45	
0.50 0.50	2 3	ES D	Tub+	VL+J			pred	lomniantl	y brown sar ly fine to me RACE DEP	edium	n flint.	velly very	silty CL	AY. Sand	l is	0.65	X0
1.50	4	D					Orar fine fine (RIV	ngey-bro to coarse to coarse 'ER TER	wn gravelly se flint. Occ	SAN casio POSIT	ND. Gravel nal subang TS)	is subar gular cob	gular to oles of f	subround lint. Sand	ded I is	- - - - - - - - - - - - - - - - - - -	
_							Firm	to stiff r	alo grov elic	abtly	candy CL A	V Sand	ic fine to	modium		2.85	<u> </u>
									oale grey slig RMATION)	grilly	Sariuy CLA	vi. Sand	is iiiie to	medium.		3.00	<u></u>
-																- - - - - -	





Contract:							Client:		Trial P	it:	
		NIAE	8 - Ph	ase 1				V Trading Limited			TP36
Contract Re	f:			Date:			Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:		
	254	59			29.0	8.12	12.13	E:544150.0 N:261146.0		1	of 1
Samp Depth	les a	ind In-si	1	sults	Water	Backfill		Description of Strata		Depth (Thick ness)	Material Graphic Legend
0.10 0.20	1 2	ES D		-VL+J =59			clayey TOPSOIL with medium flint. Humic-ric inclusions of decomposi (TOPSOIL)	crop remains over dark brown sand traces of subangular to subrounded th soils noted to 0.1m bgl. Rootel and organic matter throughout. The provided Head of the subangular fine flint.	fine to	0.25	
-							(RIVER TERRACE DEF	POSITS)		-	
0.80	3	ES	Tub-	-VL+J			predominantly medium	ey very gravelly SAND. Sand is fine to to coarse. GRavel is subangu	ılar to	0.80	
1.00	4	D						o subrounded cobbles of flint. POSITS)		- - (0.80) - -	
2.00	5	D						GRAVEL. Sand is fine to coarse. Ged fine to coarse flint. Occasional sub		1.60 -(0.80)	A A
										2.40	



General	Remarks
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1:25 All dimensions in metres Scale:

BCoulston

Logged By:

Checked Ву:

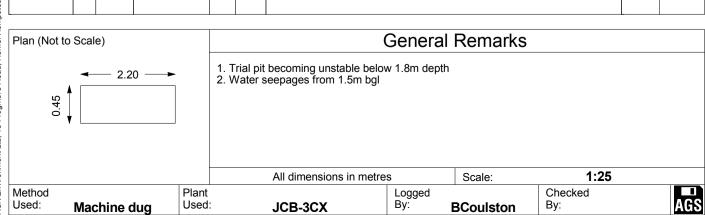
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Contract:								Client:			Trial Pi	4.	
Contract.		ΝΙΔΡ	3 - Pha	se 1					RDW	V Trading Limited	IIIairi	ι.	TP37
Contract Re	f:			Date:			Grour	nd Level (m AOI		National Grid Co-ordinate:	Sheet:		11 07
	254	59			29.08	8.12		12.16	,	E:544248.0 N:261385.0		1	of 1
Samp	oles a	ınd In-si	tu Tests		ē							Depth	Material
Depth	No		Resu	ults	Water	Backfill			[Description of Strata		(Thick ness)	Graphic Legend
0.10-0.20	1	ES					claye med inclu	ey TOPSOIL v lium flint. Hum	vith to	crop remains over dark brown sand craces of subangular to subrounded th soils noted to 0.1m bgl. Rootelf ng organic matter throughout.	fine to	- (0.45) - 0.45	17 - 3 17 - 3 17 - 3 19 - 3 19 - 3 - 17 - 3 17 - 3 17
0.50 0.50 0.50 - 0.50	2 3	ES D V	c _u ={	52			Grav (RIV	vel is predomina /ER TERRACE	DEP		coarse.	(0.40)	
1.30	5	D					Orar fine (pred of fli (RIV	to coarse. Gradominantly fine nt. //ER TERRACE	ow slavel in to m	lightly clayey very sandy GRAVEL. S is subangular to subrounded fine to nedium) flint. Occasional subangular c	coarse obbles	- 0.85	
-												- - - -	



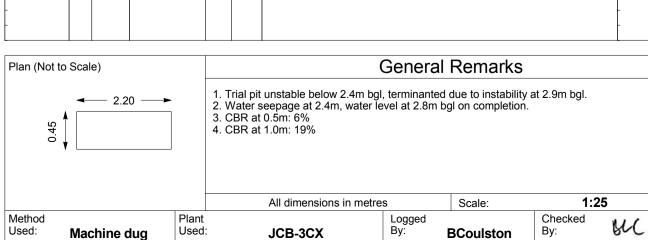
GINT LIBRARY V8 04.GLBILOg TRIAL PIT LOG - STANDARD | 25459 NIAB PHASE 1.GPJ - v8 04 | 26/10/12 - 16:39 | OP. RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442437500, Fax: 01442437550, Web: www.rsk.co.uk.



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DRAFT TRIAL PIT LOG

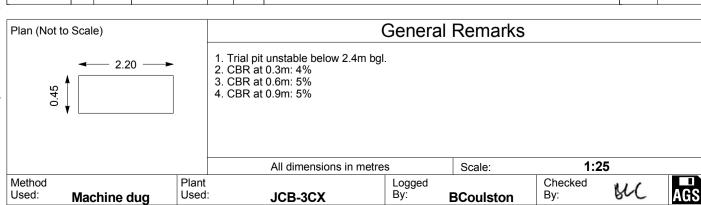
Contract:								Client:				Trial	Pit:	
		NIAB	- Pha	ase 1					BDV	/ Trading L	imited			TP38
Contract Re	f:			Date:			Groun	d Level (m	AOD):	National Grid (Co-ordinate:	Shee	et:	
	254	59			31.08	8.12		17.93		E:54379	4.0 N:2605	549.0	1	of 1
Samp Depth	oles a	1	tu Tests Res		Water	Backfill			I	Description of S	Strata		Depth (Thick	
0.30	1	ES	Tub+			ш	Coar	se. Gravel	is suba to mediu	brown sandy gr ngular to subr m aubangular b	ounded fine	to coarse flint	ness) 0	Legend
0.50	2	V D	C _u =	71			med to co (inclu	ium. Gravel	is subar Occasio otlets).	ravelly CLAY. sigular to subrounal specks of OSITS)	nded predoon	ninantly mediun) 1	
1.00	3	ES V	C _u =>				fine flint a	to medium.	Gravel occasion	gravelly silty (is predominant al subrounded (OSITS)	y subangular	s predominantly fine to mediun	1.10 y 1	XO XC X X X X X X X X X X X X X X X X X
1.50	4	D											(1.00)	x x
2.00		V	C ^u =>	130			fine subr	to coarse	predo Occasio	nd GRAVEL. Sa minantly fine onal subrounder OSITS)	to medium	sabangular to		000 a.000
2.50	5	D											2.90	000 000 000
-													- - - - - - - - - -	





DRAFT TRIAL PIT LOG

Contract:							Client:		Trial Pi	it:	
		NIAE	B - Ph	ase 1			BDV	V Trading Limited			TP39
Contract Re	f:			Date:			Ground Level (m AOD):	National Grid Co-ordinate:	Sheet:		
	254	59			31.0	8.12	14.95	E:543952.0 N:260731.0		1	of 1
Sam _l Depth	oles a	nd In-si		sults	Water	Backfill		Description of Strata		Depth (Thick ness)	Graphic
0.10-0.20	1	ES		-VL+J			clayey TOPSOIL. Sand	rop vegetation over dark brown san is predominantly fine to medium. Tra dium flint. Roots/rootlets and decon tt	aces of	- 0.25	
0.50 0.50 0.50	2	D V	C _u =	=63			predominantly fine to me	lightly gravelly sandy silty CLAY. Sedium. Gravel is predominantly subang um flint. Occaisonal cobbled flints. OSITS)	and is gular to	(0.65)	× · · ×
- 0.75		V	C _u =	=57						0.90	
1.00	3	D					Orangey-brown slightly subrounded fine to medic (RIVER TERRACE DEP) @ 1.5m Increase in fine @ 1.7m Increase in control or c	ne to medium flint gravel	ular to 1.	- - - - - -	
3.00	5 6	D ES	Tub+	-VL+J			@ 2.0m Increase in cl	ay content		-(2.40) - - - - - - - - -	
-										3.30	<u> </u>



GINT LIBRARY_V8_04.GLBiLog TRIAL PIT LOG - STANDARD | 25459 NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 16:40 | OP.
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DRAFT

Contract:								Client:			Trial F	Pit:	
		NIAB	- Pha	ase 1				ВІ	DW	V Trading Limited			TPC
Contract Re	f:			Date:			Groun	nd Level (m AOD)	:	National Grid Co-ordinate:	Sheet		
	254	59			30.08	8.12		18.33		E:543498.0 N:260506.0)	1	of 1
Sam	oles a	and In-si	tu Tests	;	Water	Backfill				D		Depth	Material
Depth	No	Туре	Res	sults	Wa	Bac			l	Description of Strata		(Thick ness)	Graphic Legend
0.05-0.15 0.50 0.50 0.60	2 3	ES ES V D	VLx2	J			TOP Occa suba (TOF Rem Firm pred coars	PSOIL with frequently assional fragmently angular brick frag PSOIL) Innants of clay piper brown/grey slite to the total community fine to the assistance of the a	ent rests of the control of the cont	dark brown sandy slightly grave rootlets. Sand is predomiantly fine to of decomposing organic matter. Ints. Dossible field drain. Ily sandy slightly gravelly CLAY. It is subrounded to need to subrounded cobbles of flint. Occasional control of the complex of the control of t	medium. Rare fine Sand is sedium to	- (0.45) - - 0.45	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1.00	4	D V	c _u =	-81			@	ULT FORMATIOI	,	ale grey. Onset of fine to medium s	ıbangular	- - - -	
1.50		V	C ⁿ =>	·130								(2.05)	

2.50 6 D 3.00 c_u=>130 ٧

D V

c,=>130

5

General Remarks

Scale:

BCoulston

Stiff blue/grey slightly silty CLAY. Occasional calcareous inclusions. (GAULT FORMATION)

1. Trial pit remained dry and stable during excavation. 2.20

2. CBR at 0.4m: 6% 3. CBR at 0.8m: 10%

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Plan (Not to Scale)

2.00 2.00

Method Used: Machine dug

Plant Used:

JCB-3CX

All dimensions in metres

Logged By:

Checked Ву:

1:25

2.50

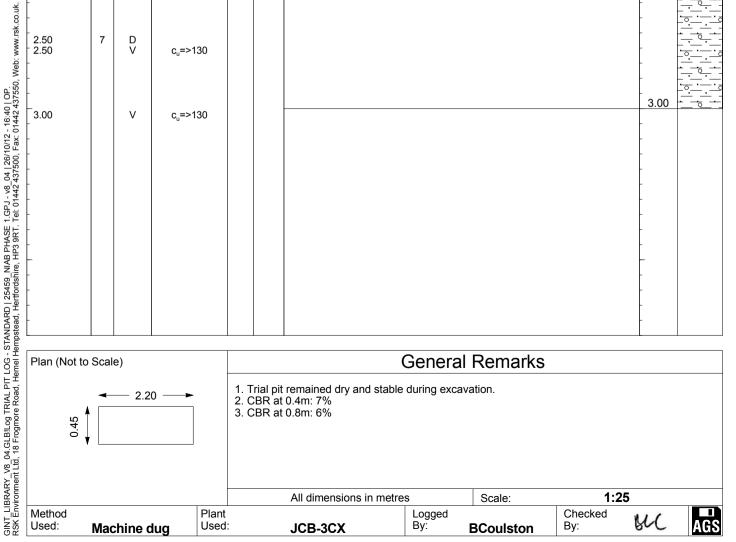
(0.50)

3.00



DRAFT TRIAL PIT LOG

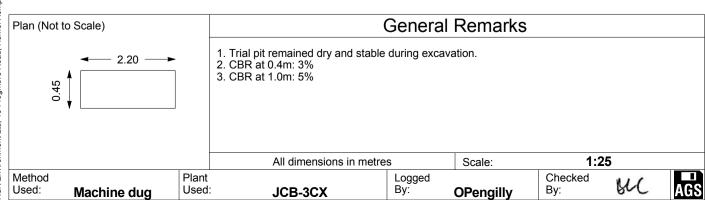
Contract:						Clier	nt:		Trial P	it:	
		NIAE	B - Phas	e 1			BDV	V Trading Limited			TPD
Contract Re	f:		Da	ate:		Ground Lev	rel (m AOD):	National Grid Co-ordinate:	Sheet:		
	254	59		30	0.08.12	19	9.03	E:543599.0 N:2606	12.0	1	of 1
Sam _l Depth	oles a	and In-si	itu Tests Result	s	Water Backfill			Description of Strata		Depth (Thick ness)	
0.10-0.20	1 2	ES D	Tub+VI+			gravelly social coarse. Go throughout matter tho	andy clayey laravel is suba t. Humic rich oughout.	rise shrub vegetation over dark TOPSOIL. Sand is predominar ngular fine to coarse flint. Fre horizon to 0.2m bgl. Decomp	atly medium to equent rootlets posing organic	(0.35)	1/2 3/
0.50 0.50	3	ES V	Tub+VI+ c _u =55			predomina fine to	antly medium t coarse flint.	gravelly CLAY. Sand is fin o coarse. Gravel is subangular Occasional subrounded cob decomposing organic matter no	to subrounded bles of flint.	(0.45)	
0.80 0.90 1.00	5	D ES V	Tub+V c _u =61			predomiar subrounde	ntly fine to me	slightly gravelly slightly sandy of dium. Gravel is predominantly inclusions and occasional fine f	subangular to	-	
1.50	6	D V	c _u =93			@ 2 Om	n Reduction in	sand and gravel constituents to	o only rare fine	(2.20)	
2.50 2.50	7	D V	c _u =>13(0		subrounde					
3.00		V	c _u =>13(0						3.00	





DRAFT TRIAL PIT LOG

Contract:								Client:					Trial Pi	t:	
		NIAE	- Pha	ase 1						V Tradir	ng Limit	ed			TPI
Contract Re	f:			Date:			Groun	d Level (m	n AOD):	National (Grid Co-ord	linate:	Sheet:		
	254	59			28.0	8.12		18.46	3	E:543	493.0 N	l:260602.	.0	1	of 1
Sam _l Depth	oles a	1	tu Tests	sults	Water	Backfill				Description	n of Strata			Depth (Thick ness)	
0.20	1	ES	Tub+				grav Occa (MAI	elly clay. aisonal fra DE GROU	Gravel is gments of ND)	angular to f tiling and o	subround ceramics.	ver brown s led fine to c	coarse flint.	-(0.40)	
0.60	2	V ES	c _u = Tul				fine	to stiff gresand. JLT FORN		AY with oc	casional po	ockets of orar	ngey-brown	-	X X X
1.00	3	D V	c _u =	120										-	X X X
1.50	4	D V	c _u =	114										- - (2.60) - -	x x x x x x x x x x x x x x x x x x x
2.50	5	D					@	Onset of	rare med	um sized g	ravels of si	Itstone		- - - - -	X X X X X X X X X X X X X X X X X X X
														3.00	xx

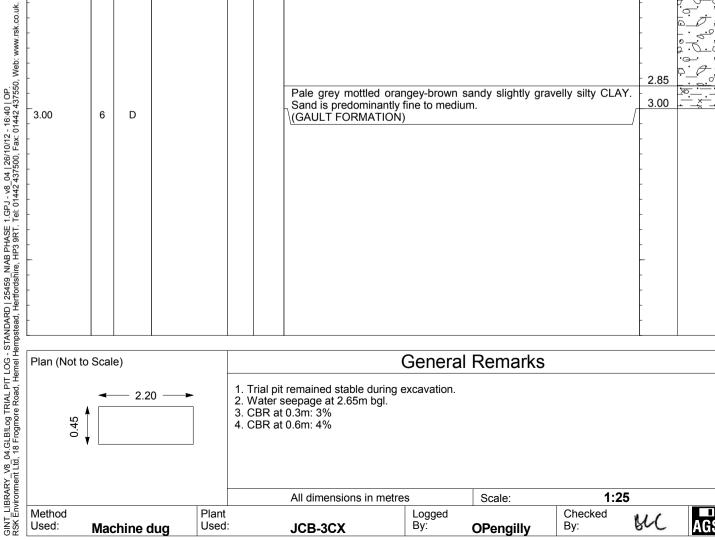


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DRAFT TRIAL PIT LOG

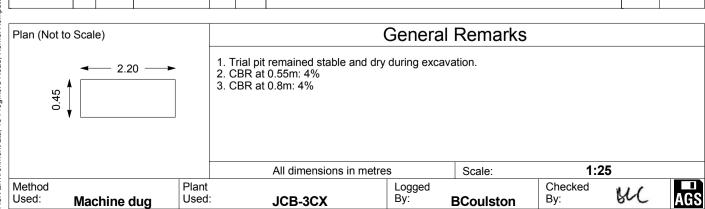
Contract:			Client:		Trial Pit	t:	
NIAB - Phase	1		BDW	/ Trading Limited			TPL
Contract Ref: Date	:	Groui	nd Level (m AOD):	National Grid Co-ordinate:	Sheet:		
25459	29.08.12	!	18.83	E:543530.0 N:260679.0		1	of 1
Samples and In-situ Tests Depth No Type Results	Water		[Description of Strata		Depth (Thick	
0.30 1 ES Tub+VI+J		to o suba fine thro	coarse predominantly pangular to subrounde	prown very sandy gravelly CLAY. Sand y fine to medium. Gravel is predom ed fine to medium flint. Traces of suba Rootles and decomposing orgamic	ninantly angular	ness)	Legend
0.70 2 ES Tub+VI+J 0.75 3 D 1.00 V c _u =59		sub	m brown sandy grave eangular to subrounde obles of flint. VER TERRACE DEPO	elly CLAY. Sand is fine to coarse. Gr d fine to coarse flint. Occasional subro OSITS)	ravel is ounded	0.60	0 - 0
1.50 4 D		fine pred (RIV		OSITS)		1.30	
3.00 6 D		San	e grey mottled orang nd is predominantly fir AULT FORMATION)	ey-brown sandy slightly gravelly silty ne to medium.	CLAY	3.00	





DRAFT TRIAL PIT LOG

Contract:		NII A D	, pi	4			Cli	ent:	/ Tue alice or I down!		Trial Pit	•	TDO
Contract Re	f.	NIAE	B - Ph	Date:			Cround L	evel (m AOD):	/ Trading Limite National Grid Co-ordir		Sheet:		TPO
	254	5 0		Date.	28.0	0 40		17.67	E:543430.0 N:		Sileet.	1	of 1
					1			17.07	L.343430.0 N.	200073.0			
		and In-si			Water	Backfill		1	Description of Strata			Depth (Thick	Material Graphic
Depth	No	Туре	Res	sults	>	ä	MADE	ODOLIND: Have	-td	laal. baarra aaaad		ness)	Legend
							CLAY v	vith traces of s	sted vegetation over o ubangular to Subrour ar fine to medium brid	nded flint. Occar	sional	(0.45)	
0.30	1	ES	Tub+	-VL+J			deposits	s. Frequent decoi	mposing organic matter	and fine rootlets	3	(0.45)	
0.30	2	D	l lab	VLIJ			,	GROUND)		1:-1-411.	-	0.45	
0.50	3	D					CLAY. C	Occasional fine to	ecoming grey by 0.75 medium subangular c	m siigntiy sandy laystone clasts.	y siity -		
-							(GAULT	FORMATION)			-		× · _ · ×
0.80	4	ES	Tub+	-VL+J									<u> </u>
1.00	5	D									-	-	- × - ×
1.00		V	C _u =	=65							-		<u> </u>
_													× × ×
-											-		× · · ×
1.50		V	C _u =	=69									x · _ · ×
_											-	(2.55)	××
-											-		xx
		_					@ 1.8	3m Consitency be	ecomes stiff, reduction	in sand content.			xx
2.00 2.00	6	D V	C _u =	=94							-		× ×
_											ţ		<u> </u>
_											-		<u> </u>
-											-		×
-											-		
_											-		
-											-	3.00	× × ×
3.00	7	D									-		
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GINT_LIBRARY_V8_04.GLBit.og TRIAL PIT LOG - STANDARD | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 16/40 | OP. RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442



Contract:			Client:		Window	Sam	ıple:	
NIAB - Pha	ase 1		BDV	V Trading Limited			V	VS 1
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	05.09.12		20.45	E:543436.0 N:260222.0		1	of	1

	7700			03.03.12		20.	TO		01 1
Progress		Samp	oles / 1	Tests	e	III.		Depth	Material
Window Run	Depth	No	Туре	Results	Water	Backfill	Description of Strata	(Thick ness)	Graphic Legend
-	0.20-0.30	1	ES	Tub+VL+Jar			MADE GROUND: Dark brown silty sandy clay with fine to medium gravels of flint brick and chalk. (MADE GROUND) Firm brown slightly sandy slightly silty CLAY with subangular fine to coarse gravels of flint and fine to coarse gravels of chalk, and with occasional pockets of fine graphy and sand Sond is prodominantly fine.	0.25	X X X X X X X X X X X X X X X X X X X
	0.50	2	D				fine orangey red sand. Sand is predominantly fine.	0.70	- <u>·</u> -×
-	0.70	3	ES	Tub+VL+Jar			Firm slightly silty mottled with orangey-brown CLAY. Some fine to medium gravels of angular flint and subrounded to rounded calcareous nodules.	-	xx
- - - - - - -	1.00-1.45 - 1.00 	1	SPT V	11 c _u =62			(GAULT FORMATION)	(1.80)	X X X
-	2.00-2.45 - 2.00	2	SPT V	12 c _u =>130			@ 1.9m Coarse (2-3 cm) pockets of red-orange sand with fine subrounded gravels of flint Rare sulfate bearing crystals noted in matrix.	2.50	X X
	- - -						Stiff finely laminated blue/grey finely mottled with orange silty CLAY with some siltstone and occasional calcareous nodules. (GAULT FORMATION)	(0.50)	X X
	- 3.00-3.45 	3	SPT	12				- - - - - - - - - -	

[Orilling Pro	gress and	Water Ob	servations	3	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	
						1.

sampling

Used:

General Remarks

OPengilly

. Borehole remained dry and stable during excavation.

MOS

1:25 All dimensions in metres Scale: Checkec WC Logged By: **Tracked window Plant Archway Competitor** Drilled Method





Contract:			Client:		Window	Sam	nple:	
NIAB - Pha	ase 1		BDV	V Trading Limited			V	VS2
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	05.09.12		19.07	E:543656.0 N:260163.0		1	of	1

	9409			05.09.12		19.	07 E.343030.0 N.200103.0		OT I
Progress		Sam	oles / T	ests	ē	■			Materia
Window Run	Depth	No	Туре	Results	Water	Backfill	Description of Strata	(Thick ness)	Graphic Legend
	0.20	1	ES	Tub+VL+J			TOPSOIL: Dark sandy clayey TOPSOIL. Sand is fine to medium with occasional coarse particles. Occasional fine to medium gravels of flint. (TOPSOIL) Firm brown slightly sandy slightly silty CLAY with subangular fine to coarse gravels of flint and fine to coarse gravels of chalk. Sand is predominantly fine.	0.20	
	1.00-1.45	1	SPT	N=11			Firm grey mottled with orangey-brown slightly silty CLAY. Some fine to medium gravels of angular flint and rounded to subrounded chalk/ calcareous nodules. (GAULT FORMATION)	<u>0.65</u> - - - -	x
	- 1.00 - - - - -		V	c _u =110			@ 1.3m increase in mottled red-orange sandy clays.	- - - (1.55) - -	x
	- - 2.00-2.45 - 2.00	2	SPT V	N=15 c _u =>130			Stiff fissured blue/grey finely mottled with orange silty CLAY with some siltstone and occasional calcareous inclusions with occasional pockets of red-orange sandy	- - - 2.20	x
	- - - - - 3.00-3.45	3	ODT	N=14			clay of 2mm to 5mm in diameter. (GAULT FORMATION)	(0.80)	x x x x x x x
	- 3.00 	3	SPT V	c _u =120				- - - -	
	-							- - - -	
	- -							-	

2	1	Orilling Pro	ogress and	Water Ob	servations	6		Con	orol	Domorko	
-	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter	Water Depth		Gen	erai	Remarks	
	Date	11110	(m)	(m)	(mm)	(m)	1. Bore	nole remained dry and s	table di	uring excavatio	n.
							Д	II dimensions in metres		Scale:	1:25
_	Method	Tracke	d windo	v Plan	Archw	ay Comp	etitor	Drilled	Logge	ed	Che

Ву:

Used:

sampling

GINT LIBRARY V8 04.GLB!Log WINDOW SAMPLE LOG | 25459 INAB PHASE 1.GPJ - v8 04 | 26/10/12 - 17:00 | OP. RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 07442 437500, Fax: 01442 437550, Web: www.rsk.co.uk.

Used:

25 Checkec WC Logged By: MOS **OPengilly**



Contract:			Client:		Window	San	nple:		
NIAB - Pha	ase 1		BDV	V Trading Limited			V	VS	3
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:				
25459	06.09.12		18.04	E:543352.0 N:260480.0		1	of	2	2

	0459			06.09.12		18.0)4	E:543352.0 N:	200400.0		1	of Z
Progress		Sami	oles / T	ests	. ∞	. 5					Danth	Material
Window Run	Depth	T	Туре	Results	Water	Instru- mentation		Description of S	trata		Depth (Thick ness)	
-	0.10	1	ES	Tub+VL+J	•••		clay with occorrick.	UND: Dark brown slig casional fine to medic	htly silty slightly um gravels of fli	sandy nt and	0.25	
-	0.50	2	D				subangular f	SUND) slightly sandy slig fine to coarse gravels ubangular to subrou les. Sand is predomin	of flint and occa	sional	(0.45)	x _ x _ x _ x _ x _ x _ x _ x _ x _ x _
-	1.00-1.45	1	SPT V	N=10 c _u =68			CLAY. Some rounded to s (GAULT FO	mottled with orange e fine to medium grav ubrounded chalk. RMATION) crease in gravel conte	éls of angular flí		(0.80)	X X X X X X X X X X X X X X X X X X X
-	- - -								·		1.50	X X
-	1.70		V	c _u =101			CLAY. (GAULT FO	grey mottled with pa	ale orange-yellov	w silty	-	X X X X — X X
-	2.00-2.45	2	SPT	N=12							(1.20)	xx
-	- - -				• • • • • • • • • • • • • • • • • • •	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	@ 2 5m C	coarse pocket of sand	v calcareous cla	ıv.	- - -	x _ x _ x _ x
-	2.70		V	c _u =82	• • • • • • • • • • • • • • • • • • • •		Stiff fissured	d blue/grey finely mo some siltstone and	ttled with orang	e silty	2.70	<u> </u>
-	2.90 3.00-3.45	3	V SPT	c _u =111 N=16	•••		occasional b (GAULT FO	rown mottling. RMATION)			-	xx
-	- - -						@ 2.9m o	nset in stiff clays at de	eptn.		-	x _ x - x _ x - x _ x
-	-										(2.30)	xx xx xx
-	4.00-4.45	4	SPT	N=16							- -	X X X

						П
1	Drilling Pro	gress and	Water Ob	oservations	3	
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter	Water Depth	
		(m)	(m)	(mm)	(m)	1. Borel
						II II BOICI
						А

GINT LIBRARY V8 04.GLB!Log WINDOW SAMPLE LOG | 25459 INAB PHASE 1.GPJ - v8 04 | 26/10/12 - 17:00 | OP. RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 07442 437500, Fax: 01442 437550, Web: www.rsk.co.uk.

Method Used:

sampling

General Remarks

OPengilly

ehole remained dry and stable during excavation.

MOS

1:25 All dimensions in metres Scale: Logged By: **Tracked window Plant Archway Competitor** Drilled Checked Used: Ву: Ву:



WINDOW SAMPLE LOG

Contract:						Client:			Windov	v Samp	le:
	NIAB -	Pha	ase 1					V Trading Limited			WS3
Contract Ref:			Date:		Groun	d Level	(m AOD):	National Grid Co-ordinate:	Sheet:		
25	5459			06.09.12		18.		E:543352.0 N:260480.0		2	of 2
Progress		Sam	oles / T	ests	Te.	fill & rru- ation		Description of Otroto		Depth	Material Graphic
Window Run	Depth	No	Туре	Results	Water	Backfill & Instru-mentation		Description of Strata		(Thick ness)	Legend
	5.00-5.45	5	SPT	N=30			Stiff fissure CLAY with occasional (GAULT FO (stratum to previous should be also @ 4.6m gravels of for also @ 4.7m	Occasional rounded to subrounded n	es with	5.00	

	[Orilling Pro	gress and	Water Ob	servations	3			Con	orol	Domorko		
,	Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)			Gen	erai	Remarks		
)													
							P	All dimension	ons in metres		Scale:	1:25	
	Method Used:		d windov npling	V Plan Use	t Archw d:	ay Comp	etitor	Drilled By:	MOS	Logge By:	OPengilly	Checked By:	AGS

GINT_LIBRARY_V8_04.GLB!Log WINDOW SAMPLE LOG | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 17:00 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.uk.



AGS

Contract:			Client:		Window	San	ıple:	
NIAB - Pha	ase 1		BDV	V Trading Limited			V	VS4
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	05.09.12		19.45	E:543546.0 N:260409.0		1	of	2

	7700			03.03.12		13.	TO E.OTOOTO.O 11.200T03.0		
Progress	_		oles / T	ests	_	=		Depth	Material
Window Run			Туре	Results	Water	Backfill	Description of Strata	(Thick ness)	Graphic Legend
-	0.10-0.20	1 2	ES D	Tub+VL+J			MADE GROUND: Friable dark brown clayey SAND with fine to medium gravels of flint and occasional fragments of brick. (MADE GROUND)	0.20	
-	0.50	3	ES	Tub+VL+J			Firm light brown to grey slightly sandy CLAY with medium clasts of chalk and with occasional pockets of orange clayey sand. Sand is fine.	(0.60)	
-	- - - 1.00-1.45 -	1	SPT	N=10			Firm grey mottled yellow brown slightly silty slightly sandy CLAY with Occasional calcitic nodules. (GAULT FORMATION) @ 0.8 increase in sand content	0.80	x x x x x x x x x x x x x x x x x x x
	-							(1.10)	x x x x x x x x x x x x x x .
-	1.80		V	c _u =115			@ 1.7m mottling becomes less frequent.	1.90	x. -x
-	2.00-2.45 	2	SPT	N=11			Firm to stiff fissured dark grey silty CLAY with frequent pockets of mottled with orange sandy clays. (GAULT FORMATION)	- - -	X X
-	-						@ 2.3m rare crystals of selenite noted and continue at depth.	-	<u>x x</u>
-	-						@ 2.4m onset of coarse sand to fine gravels of hard and soft nodular calcrete.	- - -	x _ x - x _ x
-	3.00-3.45 - 3.00 - -	3 4	SPT D	N=13				(3.10)	x _ x _ x _ x _ x _ x _ x _ x _ x _ x _
- - - - - - -	- - - 4.00-4.45 - -	4	SPT	N=14			@ 3.5m reduction in mottled orange sandy clays. Fine to medium inclusions of siltstone (0.1cm to 1cm).	- - - - - -	X X X X X X X X X X X X X X X X X X X

-	-										-
Date	Drilling Pro	Borehole Depth	Water Ob Casing Depth	Servations Borehole Diameter	Water Depth			Gene	eral	Remarks	
Date	Time	(m)	(m)	(mm)	(m)	1. Bore	hole remain	ed dry and st	table du	ıring excavation.	
						ļ A	All dimension	ns in metres		Scale:	1:25
Method Used:		d windov npling	V Plan Use	t Archw ad:	ay Comp	etitor	Drilled By:	MOS	Logge By:	d OPengilly	Checked By:

GINT LIBRARY V8 04 GLB!Log WINDOW SAMPLE LOG | 25459. NIAB PHASE 1.GPJ - v8.04 | 26/10/12 - 17:00 | OP. RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.ulk.



Contract:			Client:		Window	/ San	nple:	
NIAB - F	hase 1		BD\	N Trading Limited			V	VS4
Contract Ref:	Date:	Ground	d Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	05.09.12		19.45	E:543546.0 N:260409.0		2	of	2
		-						

2:	0459			05.09.12		19.	45	E:543546.0	J N:260409.0		of Z
Progress			oles / T		Water	Backfill		Description	of Strata	Depth (Thick	Material Graphic
Window Run	Depth		Туре	Results	Š	Ba				ness)	Legend
	4.50-5.00	5	D				pockets of (GAULT FC	mottled with orang DRMATION) fext copied from I	ey silty CLAY with fr ge sandy clays. layer at 1.90m dept	5.00	X X X X X X X X X X X X X X X X X X X
	5.00-5.45	5	SPT	N=19						-	
	-									-	
	-										
	-									_	
-	-									_	
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	_									-	

	[Orilling Pro	gress and	Water Ob	servations	6		Con	orol	Domorle		
,	Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)		Gene	erai	Remark		
			()	()	(*****)	()						
0												
:												
:												
,							P	All dimensions in metres		Scale:	1:25	
j	Method	Tracke	d windov	v Plan	Archw	ay Comp	etitor	Drilled	Logge	d	Checked	

GINT_LIBRARY_V8_04.GLBit.og WINDOW SAMPLE LOG | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 17:00 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.ulk.

sampling Used:

Used:

Ву: MOS By: OPengilly By:

AGS



Contract:			Client:		Window	San	Sample:		
NIAB - Pha	ase 1		BDV	BDW Trading Limited					
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:				
25459	05.09.12		18.42	E:543676.0 N:260287.0		1	of	1	

2:	0459			05.09.12		18.	42	E:543676.0 N:260287.0		1	of 1
Progress		Sam	oles / T	Tests	Water	Backfill		Description of Strata		Depth (Thick	Material Graphic
Window Run	Depth	No	Туре	Results	Wa	Bac		•		ness)	Legend
-	- 0.05-0.15	1	ES	Tub+VL+J			with some fragments (MADE GF	ROUND) rm brown slightly sandy CLAY with ne to coarse gravels of flint. Occaison	some	- 0.15	
-	1.00-1.45 - 1.00 - 1.00 - 1.00	1 2 3	SPT ES D	N=12 Tub+VL+J			occasional	slightly silty mottled with orange CLA linclusions of chalk. ORMATION)	Y with	0.90	X X
-	-						@ 1.6m	Onest of stiff clay.		(1.20)	X X
-	2.00-2.45	2	SPT	N=13			with some	ed silty grey slightly mottled with orange siltstone and chalk inclusions. ORMATION)	CLAY	2.10	X X
- - -	-									3.00	x x
- - -	3.00-3.45	3	SPT	N=12						-	
- - - -	- - -									- - -	
-	-									-	

	Г	Orilling Pro	gress and	Water Ob	servations				Con	oral	Remarks		
	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter	Water Depth			Gen	cıaı	Remarks		
200			(m)	(m)	(mm)	(m)	1. Bore	nole remai	ned dry and s	table dı	uring excavation.		
2													
2													
í													
5							A	II dimensio	ons in metres		Scale:	1:25	
	Method Used:		d windov npling	V Plan Used	t Archw	ay Comp	etitor	Drilled By:	MOS	Logge By:	d OPengilly	Checkec By:	AGS

GINT_LIBRARY_V8_04.GLB!Log WINDOW SAMPLE LOG | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 17:01 | OP-RSK Environment Ltd, 18 Frogmore Road, Hempstead, Herifordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437556, Web: www.rsk.co.uk.



Contract:				Client	:		Windo	w Samp	ole:	
	NIAB - Ph	ase 1			BDV	V Trading Limited			W	/ S6
Contract Ref:		Date:	Groun	d Leve	I (m AOD):	National Grid Co-ordinate:	Sheet:			
2	5459	06.09.12		18.	14	E:543448.0 N:260554.0		1	of	1
Progress	Sam	ples / Tests	_	T =				Denth	Ma	ateria

				00:00::2					
Progress		Sam	ples / 1	Tests	Ē	=		Depth	Material
Window Run	Depth	No	Туре	Results	Water	Backfill	Description of Strata	(Thick ness)	Graphic Legend
-	0.10-0.20	1	ES	Tub+VL+J			MADE GROUND: Brown slightly sandy clay with some angular to subangular fine to medium gravels of flint, brick and fine rounded chalk. (MADE GROUND)	0.30	
-	0.30-0.40	3	D ES	Tub+VL+J			Firm brown mottled with red/brown slightly sandy CLAY with fine gravels of subrounded chalk and subangular flint.	(0.40)	
-	1.00-1.45	1	V	c _u =65 N=12			Firm fissured slightly silty mottled with orangey-brown/grey CLAY with some fine to medium gravels of flint and subrounded to rounded calcareous nodules. (GAULT FORMATION)	0.70	X X X X X X X X X X X X X X X X X X X
-	2.00-2.45	2	SPT V	N=12 c _u =115				(2.30)	X X X X X X X X X X X X X X X X X X X
-	3.00-3.45	3	SPT	N=12			@ 2.5m Yellow brown mottling becomes fainter and contributes to a 5-30% discolouration of the matrix.	3.00	X X
-	-		OF I	14-12				- - - - -	
-	-							- - - -	

		Orilling Pro			servations				Gen	oral	Remarks		
Da	ate	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	<u></u>						
			. ,	. ,		. ,	1. Bore	nole remai	ned dry and si	table di	uring excavation.		
:													
								n P				4.05	
								ii aimensia	ons in metres		Scale:	1:25	
Met Use			d windov ipling	V Plan Used	t Archw ad:	ay Comp	etitor	Drilled By:	MOS	Logge By:	OPengilly	Checked By:	AGS

GINT_LIBRARY_V8_04.GLBit.og WINDOW SAMPLE LOG | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 17:01 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.ulk.



Contract:			Client:		Window	San	Sample:		
NIAB - Pha	ase 1		BDV	V Trading Limited			V	VS:	7
Contract Ref:	Date:	Groun	nd Level (m AOD):	National Grid Co-ordinate:	Sheet:				
25459	05.09.12		18.42	E:543757.0 N:260380.0		1	of	1	

Z)4 03			05.09.12		10.	42 E.545757.0 N.200360.0	ı	OT I
Progress		Sam	ples / 1	Tests	_	æ		Depth	Material
Window Run	Depth	No	Туре	Results	Water	Backfill	Description of Strata	(Thick ness)	Graphic Legend
-	0.10	1	ES	Tub+VL+J			TOPSOIL: Dark brown slightly clayey predominantly medium to coarse SAND with some fine to coarse angular to subangular gravels of flint. (TOPSOIL)	0.35)	70.70.7 7.77.7 7.77.7 7.7.7
- - -	0.50	2 3	ES D	Tub+VL+J			Orange to dark brown clayey medium SAND with occasional to some gravels of angular to subangular medium to coarse flint. (RIVER TERRACE DEPOSITS)	(0.30)	
-	-						Firm orangey-brown gravelly sandy CLAY. Sand is predominantly medium to coarse. Gravel is predominantly angular flint. (RIVER TERRACE DEPOSITS)	(0.45)	- · · · · ·
-	1.00-1.45	1	SPT(c)	N=13			\ @ 1m increase in sand and gravel content.	1.10	
-	1.20-1.30	4	D				Orangey-brown SAND and GRAVEL. Sand is	(0.30)	
-	-						predominantly fine, occasionally medium to coarse. Gravel is angular to subangular fine to coarse flint. ((RIVER TERRACE DEPOSITS)	1.40	<u>× - ×</u>
-	-						Stiff slightly silty slightly sandy grey mottled with yellow brown CLAY. (RIVER TERRACE DEPOSITS)	(0.60)	xx
-	_						@ 1.7 and 1.8 lense of sandy clay.	2.00	× · · ×
-	2.00-2.45	2	SPT	N=10			Stiff grey mottled orangey brown, occasionally mottled orange-red slightly silty sandy CLAY with subangular to subrounded fine to coarse gravels of flint and calcareous nodules. (RIVER TERRACE DEPOSITS)	(0.80)	X
_	_						@ 2.6 Increase in sand content.	2.80	XTT_X
- - -	3.00-3.45	3	SPT	N=9			Orangey-brown coarse SAND with occasional to some angular to subangular fine to coarse gravel of flint and with occasional pockets of grey silty clay. Stratum is saturated throughout. (RIVER TERRACE DEPOSITS)	-	
	-							(1.20)	
-	4.00-4.45	4	SPT(c)	N=7				4.00	

	Drilling Pro	gress and	Water Ob	servations	3
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)

General Remarks

Borehole becoming unstable below 4m bgl.
 Water seepage noted at 3m bgl.

1:25 All dimensions in metres Scale: Drilled

Tracked window Method Used: sampling

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Plant Archway Competitor Used:

Ву: MOS Logged Ву: **OPengilly**

Checked Ву:





Contract:			Client:		Window	Sample:		
NIAB - Pha	ase 1		BDV			V	VS8	
Contract Ref:	Date:	Groun	nd Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	07.09.12		18.43	E:543575.0 N:260763.0		1	of	1

	7700			07.03.12		10.	TO E.OTOO1 0.0 14.2001 00.0		01 1
Progress	;	Samp	oles / T	ests	7.	a - loi tion			Material
Window Run	Depth	No	Туре	Results	Water	Backfill & Instru-mentation	Description of Strata	(Thick ness)	Graphic Legend
	0.30-0.40	1	ES	Tub+VL+J			MADE GROUND: Brown slightly silty sandy clay with fine to medium gravels of angular flint, fine brick clasts and occasional fine chalks. (MADE GROUND)	-(0.45)	
	0.80	2	D				Orangey-brown to red slightly gravelly medium SAND. Gravel is angular fine to coarse flint. (RIVER TERRACE DEPOSITS) @ 0.5m Increase in sand content	- 0.45	
	-							(1.45)	0 D
	-						@ 1.7m Gravel content within the matrix increases to $\ \ \ \ \ \ \ \ \ \ \ \ \ $	1.90	
-	-						Orangey-brown SAND and GRAVEL. Sand is coarse. Gravel is subangular fine flint.	(0.30)	
	- - - -						(RIVER TERRACE DEPOSITS) Stiff fissured grey occasionally mottled pale yellow brown silty CLAY with occasional selenite crystals. (GAULT FORMATION)	(0.80)	x
=	- - -							3.00	×
	-							-	
	-							_	
-	- -							_	
	-							_	
	-								

rilling Pro	gress and	Water Ob	servations	3
Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)
		Borehole Time Depth	Borehole Casing Time Depth Depth	Time Depth Depth Diameter

sampling

Used:

General Remarks

Ву:

Ву:

OPengilly

- Borehole unstable below 2.5m bgl.
 Water seepage noted at 2.1m bgl.

MOS

1:25 All dimensions in metres Scale: **Tracked window Plant Archway Competitor** Drilled Checked Method Logged

Ву:

GINT_LIBRARY_V8_04.GLBit.og WINDOW SAMPLE LOG | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 17:01 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.ulk.



Contract:			Client:		Window	San	mple:		
NIAB - Pha	ase 1		BDV	BDW Trading Limited					
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:				
25459	07.09.12		18.52	E:543683.0 N:260586.0		1	of	1	

25455			07.09.12			10.	DZ E.343003.0 N.200300.0	<u> </u>	OT I
		nples / Tests		Water	Backfill	Description of Strata	Depth (Thick		
Window Run	Depth	No	Туре	Results	Wa	Ba	·	ness)	
	0.10	1	ES	Tub+VL+J			MADE GROUND: Dark brown sandy CLAY with angu fine to medium gravels of flint and fine to medium bri tiling. (MADE GROUND)		
	-						Orangey-brown gravelly SAND. Gravel is angular fine coarse flint. Sand is predominantly fine to medium.	to	(
	0.70-1.00	2	D					(0.60)	0.0
-	1.00-1.45	1	SPT(c)	N=29			Medium dense orangey-brown slightly gravelly fine medium SAND. Gravels are subangular fine to mediu predominantly medium flints with occasional coar flints, and occasional subrounded fine chalks. (RIVER TERRACE DEPOSITS)	se (0.50)	0 e
	1.60	3	ES				Firm orangey-brown to red mottled with orangey-r gravelly very sandy CLAY. Gravels are fine to medium (RIVER TERRACE DEPOSITS)	1.50 ed . [(0.60)	
_	2.00-2.45	2	SPT(c)	N=24				2.10	- <u>·</u>
	- - -						Orangey brown to yellow medium to coarse SAN Occasional angular fine gravels of flint. (RIVER TERRACE DEPOSITS)	(0.70)	
	-						@ 2.60 to 2.80m Lense of orangey-brown and gr SAND and GRAVEL. Sand is coarse. Gravel subangular fine to medium flint.	is	
_	3.00-3.45	3	SPT	N=13			Stiff blue/grey thinly laminated mottled pale yellow si CLAY. (GAULT FORMATION)	3.00	x ×
	-							_	
	-								
	-							-	
	-							_	
	-							-	

	Drilling Progress and Water Observations														
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)										

General Remarks

1. Trial pit remained stable during excavation.

MOS

2. Water seepage noted at 2.6m.

All dimensions in metres Scale: 1:25

ked window Plant Archway Competitor Drilled Logged Checket

Method Used: Tracked window sampling

GINT_LIBRARY_V8_04.GLBit.og WINDOW SAMPLE LOG | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 17:01 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.ulk.

Used:

By:

Logged
By: **OPengilly**

Checked By:

AGS



Contract:			Client:		Window	Sample:		
NIAB - Pha	ase 1		BDV			WS	310	
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	10.09.12		17.48	E:543835.0 N:260462.0		1	of	1

25459 10.09.12				2 17.48 E:543835.0 N:260462.0			E:543835.0 N:260462.0	1	of 1	
Progress		Sam	ples / T	ests	Water	Backfill	Description of Strata		Depth	Materia Graphic
Window Run	Depth	No	Туре	Results	Wa	Вас			ness)	Legend
	0.20	1	ES	Tub+VL+J			medium S	Brown slightly silty slightly clayey fine t AND with occasional fine to medium gravel to subangular flint.		1/2 - 2 1/2 - 3 1/2 -
	-						orange bro to coarse decompos	brown to orange occaisonally mottled wit own sandy CLAY with gravels of angular fin e flint and with occasional pockets of ing organic matter noted between 0.7m an entially reworked).	e [of (0.55)	
	0.80	2	ES	J					0.95	
-	1.00-1.45	1 3	SPT(c)	N=12				rown fine to medium SAND. ERRACE DEPOSITS)	1.10	
	1.00 - -	3	D					brown to orangey mottled with orangey-brow AY with fine to medium gravels of angular t	o [(0.30)	
	-						$\sqrt{(RIVER\;TE)}$	ERRACE DEPOSITS)	1.40	
	-						Gravel is s	prown SAND and GRAVEL. Sand is coarse subangular fine flint. ERRACE DEPOSITS)	1.70	
	-						Dense Lig	ht brown fine SAND with occasional angula	ır _	
-	2.00-2.45 - -	2	SPT(c)	N=31					(0.80)	
	-								2.50	
	-						fine to c	ingey-brown SAND and GRAVEL. Sands ar oarse predominantly coarse. Gravels ar e to medium flint. ERRACE DEPOSITS)		
-	3.00-3.45	3	SPT(c)	N=31					3.00	
	-		0(0)							
	-								-	
	-									
	-								-	
	-								-	
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-	_								F	
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I	Drilling Progress and Water Observations													
Date	ate Time Borehole Casing Borehole Water Time Casing Borehole Water Casing Borehole Water Depth Diameter Depth (m) (m) (mm) (r													

sampling

Used:

General Remarks

Ву:

Ву:

OPengilly

Borehole unstable below 2.8m bgl.
 Water seepage njoted at approximately 2.2m bgl.

MOS

1:25 All dimensions in metres Scale: **Tracked window Plant Archway Competitor** Drilled Checked Method Logged

Ву:

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WINDOW SAMPLE LOG

Checked

OPengilly

AGS

Contract:			Client:		Window	San	Sample:		
NIAB - Ph	ase 1		BDV			W	S1 1		
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:				
25459	07.09.12		16.83	E:543741.0 N:260740.0		1	of	1	

Zi)40 9		07.09.12			10.	03 E.343741.0 N.200740.0	ı	OT I
Progress				nples / Tests				Depth	Material
Window Run	Depth	No	Туре	Results	Water	Backfill	Description of Strata	(Thick ness)	Graphic Legend
-	-						TOPSOIL: Dark brown slightly silty clayey SAND with gravels of angular fine to medium occasionally coarse flints and chert. (TOPSOIL)	(0.50)	1/2 3 1/2 3 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2
-	0.40	1	ES	Tub+VL+J			@ 0.3m increase in clay content	0.50	11: 11: 11: 1
- - -	-						Firm orangey dark brown mottled with dark grey slightly sandy CLAY with occasional angular fine to coarse gravels of flint. (RIVER TERRACE DEPOSITS)	(0.80)	
-	0.90-1.00 1.00-1.45	2	D SPT(c)	N=9				-	
- -	- 1.00-1.45	'	SPT(C)	N=9				1.30	
- -	-						Firm pale grey mottled with pale orangey-brown and red-brown silty CLAY with occasional inclusions of fine calcareous nodules. (GAULT FORMATION)	_	X X
- - -	1.70-2.00	3	D					(1.10)	x x
- - -	2.00-2.45	2	SPT	N=15			@ 1.9m onset of stiff clay.	_	
• -	-						Stiff fissured dark blue/grey CLAY. (GAULT FORMATION)	2.40	<u>* *</u>
-	-							(0.60)	
-	3.00-3.45	3	SPT	N=12				3.00	
-									
-									
-	_								
-	-							-	
- -	-							- -	
- -	-							-	
-	- -							-	

2							П					
2	[Orilling Pro	ogress and	Water Ob	servations	3			Con	orol	Domorko	
	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter	Water Depth			Gen	erai	Remarks	
			(m)	(m)	(mm)	(m)	1. Bore	hole remai	ned dry and s	table th	roughout excava	ition.
2												
2												
<u>.</u>												
2												
5							A	II dimensio	ons in metres		Scale:	1:25
	Method Used:		d windov	N Plan Use		ay Comp	etitor	Drilled By:	MOS	Logge By:	OPengilly	Check By:

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sampling



Contract:			Client:		Window	nple:			
NIAB - Pha	ase 1		BDV	BDW Trading Limited					
Contract Ref:	Date:	Groun	nd Level (m AOD):	National Grid Co-ordinate:	Sheet:				
25459	10.09.12		16.12	E:543933.0 N:260602.0		1	of	1	

Zi	3433		10.09.12			10.	14	E.343933.0 N.200002.0	I	OT I
Progress		Sam	ples / 1	Tests	_	=			Depth	Material
Window Run	Depth		Туре		Water	Backfill		Description of Strata	(Thick ness)	Graphic
-	0.20-0.30	1	ES	Tub+VL+J			medium (decomposi (MADE GR		0.30	
-	-						Firm dark I to medium	prown to orange sandy CLAY with some fine angular gravels of flint.	0.55	
- - -	0.80	2	D				Firm grey CLAY with and angula	increase in clay content mottled with pale orange grey slightly silty gravels of subangular fine to medium chalk r fine to medium flint. DRMATION)	(0.65)	X _ X
-	1.00-1.45	1	SPT	N=12			(31.13.11	,	1.20	x _ x
- - - - -	-						CLAY with gravels of subangular	ed grey mottled with pale orange-yellow silty frequent calcareous nodules, angular fine chalk clasts and occasional gravels of to subrounded fine to medium flints.	(0.80)	X X X X X X X X X X X X X X X X X X X
	2.00-2.45	2	SPT	N=16			Stiff fissure (GAULT FO	ed grey silty CLAY. DRMATION)	2.00	X X X X X X X X X X X X X X X X X X X
_ - -	2.50	3	D						(1.00)	X X
- - -	3.00-3.45	3	SPT	N=15					3.00	xx
-									- - -	
-	- - -								- -	
-	-								-	
_										

5													
		Orilling Pro	gress and Borehole	Water C	bservation	S Water			Gen	eral	Remarks		
oad,	Date	Time	Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	1 Borel	hole remain			roughout excava	tion	
2							1. Dole	noie remail	ied dry arid si	lable tri	loughout excave	ition.	
60.													
, Eg													
								II dimensio	ns in metres		Scale:	1:25	
-	Method	Tracke	⊥ d windo\	v Pla	nt Archw	ay Com		Drilled	iis iii iiicties	Logge		Checked	AGS
Ś	Used:	san	npling	Use		•		Ву:	MOS	By:	OPengilly	By:	AGS

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sampling

OPengilly By: By:



WINDOW SAMPLE LOG

Contract:			Client:	Client:					
NIAB - Pha	ase 1		BDV			W	S13		
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:				
25459	07.09.12		15.32	E:543830.0 N:260816.0		1	of	1	

	9459 07.09.12			15.	E.343030.0 N.2000 10.0		I	OT I		
Progress		Sam	ples / 1	Tests	L	=				Material
Window Run	Depth	No	Туре	Results	Water	Backfill	Description of Strata		Depth (Thick ness)	Graphic
-	-						MADE GROUND: Dark brown slightly silty clay with subangular to subrounded fine to medium of flint and occasional brick.	ey sand gravels	(0.30)	
- - - -	0.30	1	ES	Tub+VL+J			Firm brown slightly sandy slightly silty CL subangular fine to coarse gravels of flint and coarse gravels of chalk. Sand is predominantly (RIVER TERRACE DEPOSITS)	d fine to	-	X X X
- - -	1.00-1.45 1.00	1 2	SPT D	N=4					- (1.25) - -	X X X X X X X X X X X X X X X X X X X
- - -	-						@ 1.40 to 1.55m Lense of orangey brown f	ine sand,	1.55	x · · x · · x · · · x · · · x
- - -	-						with angular coarse gravel of fint. Firm light grey mottled orangey-brown sandy C subrounded fine to medium gravels of chalk. (RIVER TERRACE DEPOSITS)	_AY with	1.80	
-	2.00-2.45	2	SPT	N=4			Orangey-brown fine SAND. (RIVER TERRACE DEPOSITS)		2.10	
- - - -	-						Orangey-brown clayey fine SAND with or coarse sand. (RIVER TERRACE DEPOSITS)	casional	-	
- - - - - - -	3.00-3.45	3	SPT(c)	N=36			@ 2.8m onset of predominantly coarse s pockets of clayey fine sand.	and with	(1.60)	
- - - - -	4.00-4.45	4	SPT(c)) N=18			Orangey-brown and coarse SAND and GRAVE is fine to medium. Gravel is angular fine to med subrounded chalk and flint clasts. (RIVER TERRACE DEPOSITS)		3.70 (0.30) 4.00	0.00
-	-								-	

			·			
[Orilling Pro	gress and	d Water Ob	servations	3	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	-

sampling

Used:

General Remarks

Ву:

OPengilly

- 1. Borehole terminated at 4m bgl due to collapsing gravels
- Water seepage at approximately 2.6m bgl.
 Water level noted at 2.5m bgl prior to backfilling.

MOS

1:25 All dimensions in metres Scale: Plant Archway Competitor **Tracked window** Drilled Checked Logged

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Contract:			Client:	Window	nple:				
NIAB - Pha	ase 1		BDV	BDW Trading Limited					
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:				
25459	07.09.12		14.29	E:543929.0 N:260803.0		1	of	1	

2	7700						23		01 1
Progress		Sami	ples / 1	Tests		_		Donth	Material
Window Run	Depth	No			Water	Backfill	Description of Strata	(Thick ness)	
-	0.10-0.20	1	ES	Tub+VL+J			MADE GROUND: Dark brown slightly silty sandy clay with fine to medium gravels of flint and rare to occasional fine clasts of brick. (MADE GROUND)	(0.35)	
_	0.40-0.60	2	D				Firm brown slightly sandy slightly silty CLAY with subangular fine to coarse gravels of flint and fine to coarse gravels of chalk. Sand is predominantly fine.	0.55	× · · × · · · · · · · · · · · · · · · ·
	-						Firm light brown mottled grey slightly silty very sandy CLAY. Sand is predominantly fine. Gravel is angular fine to coarse flint and rounded fine chalk. (RIVER TERRACE DEPOSITS)	-	x x x
-	1.00-1.45	1	SPT	N=14			@ 0.9m Increase in gravel content to 15% of matrix consiting of predominantly fine to medium flint.	- - (1.35)	x
- - -	-						@ 1.5m Subrounded cobble of flint gravel.	-	× _ × × _ × × _ × _ ·
- - -	2.00-2.45	2	SPT(c)	N=12			@ 1.80 to 1.90m Lense of soft orangey-brown clayey SAND. Orangey brown gravelly SAND. Sand is fine to coarse.	1.90	×
-	-						Gravels are subangular to rounded fine to coarse flint. (RIVER TERRACE DEPOSITS)	2.20	
-	2.40-2.60	3	D				Firm to stiff thinly laminated light grey silty mottled pale yellow-orange CLAY. (GAULT FORMATION)	(0.80)	xx
- - -	3.00-3.45	3	SPT	N=47			@ 2.8m onset of sand clay with angular fine to coarse gravels of flint.	3.00	x -x
-	- -							- -	
	-							-	
-	-							- -	
-	-							-	
†	†							-	

]	Drilling Pro	gress and Borehole	Water Ob	servations Borehole	S Water		Gen	eral	Remarks		
Date	Time	Depth (m)	Depth (m)	Diameter (mm)	Depth (m)		ned stable du page noted at				
Method Used:		d windov	V Plan	t Archw ad:	ay Comp	II dimension Drilled By:	ons in metres	Logge By:	Scale: d OPengilly	1:25 Checked By:	AGS

GINT_LIBRARY_V8_04.GLB!Log WINDOW SAMPLE LOG | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 17:02 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.uk.



Contract:			Client:	Client:					
NIAB - Ph	ase 1		BDV			W	S15		
Contract Ref:	Date:	Grour	nd Level (m AOD):	National Grid Co-ordinate:	Sheet:				
25459	10.09.12		13.50	E:544079.0 N:260737.0		1	of	2	

	7700					10.	DO E.OTTO/ 3.0 14.200/ 5/1.0	•	01 2
Progress		Sami	oles / T	Tests		_		Donth	Material
Window Run	Depth		Туре		Water	Backfill	Description of Strata	(Thick ness)	
-	0.20-0.30	1	ES	Tub+VL+J			MADE GROUND: Brown slightly silty clayey SAND with angular fine to medium gravel of flint. Rare to occasional fine clasts of charcoal and decomposed organic matter noted at 0.25m depth. (TOPSOIL)	0.30	1/ · 2 · 1/ · 2 · 1/ · 2 · 1/ · 2 · 2 · 1/ · 2 · 2 · 1/ · 2 · 2 · 1/ · 2 · 2 · 2 · 2 · 2 · 2 · 2 · 2 · 2 ·
	- - -						Loose orangey-brown slightly clayey fine to medium predominantly fine SAND with occasional fine gravels of subangular flint. ((RIVER TERRACE DEPOSITS) Firm grey mottled orangey-brown sandy CLAY with	0.60	
	1.00-1.45	1	SPT	N=17			subrounded fine gravels of chalk and with coarse pockets of fine SAND. (RIVER TERRACE DEPOSITS)	1.20	
-	1.20	2	D				@ 1.0m Onset of clayey sand. Stiff fissured light grey mottled with orangey-brown silty CLAY with rare coarse gravels of angular flint and with occasional fine partings of siltstone. (RIVER TERRACE DEPOSITS)	(0.70)	X X
- - - - - -	- - - 2.00-2.45 - -	2	SPT(c)) N=15			Orangey-brown gravelly fine to coarse SAND. Gravels are angular fine to coarse flint. (RIVER TERRACE DEPOSITS) Fining upwards. Firm grey slightly sandy silty CLAY. (RIVER TERRACE DEPOSITS)	1.90 (0.40) 2.30 (0.30)	. 0
-	3.00-3.45	3	SPT	N=17			Orangey-brown fine SAND with occasional angular gravels of coarse flint. (RIVER TERRACE DEPOSITS) Firm grey/blue very silty CLAY. (GAULT FORMATION) Coarsening upwards @ 3.0m increase in fine sand content. @ 3.5m strata description discontinued.	2.60 (0.30) 2.90 (0.60)	X
-	4.00-4.45	4	SPT	N=6				- - - - -	

Drilling Progress and Water Observations Borehole Depth (m) Borehole Diameter Water Depth (m) Casing Depth (m) Date Time (mm)

Used:

Tracked window

sampling

General Remarks

- 1. Borehole unstable below 2.6m bgl, collapse reported at 3.5m bgl.
- Stratum descriptions discontinued at 3.5m bgl owing to instability and backfilling, SPT data continued to 5m.
- 3. Water seepage noted during drilling at approximately 2m bgl.4. Water Level measured at 1.85m bgl on completion.

MOS

All dimensions in metres 1:25 Scale: **Plant Archway Competitor** Drilled Logged Checked Ву: By: Ву:

OPengilly

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DRAFT WINDOW SAMPLE LOG

Contract:						(Client:		Window Sample:				
	NIAB - Phase 1								BDW Trading Limited				
Contract Ref:	Contract Ref: Date: Gro							(m AOD):	National Grid Co-ordinate:	Sheet:			
25459 10.09.12							13.	50	E:544079.0 N:260737.0		2	of 2	
Progress		Sam	ples / T	ests		ē	ackfill				Depth	Material	
Window Run Depth No Type Results				Water	Back		Description of Strata		(Thick ness)	Graphic Legend			
											_		

Progress	Samples / Tests				er	III.		Depth	Material
Window Run	Depth	No	Туре	Results	Water	Backfill	Description of Strata	Depth (Thick ness)	Material Graphic Legend
-	-							-	
-	-							-	
_	-								
_	_ 5.00-5.45	5	SPT	N=8				_	
-	5.00-5.45	5	SFI	IN-O				-	
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	С	Drilling Pro	gress and	Water Ob	oservations	3			Con	orol	Remarks		
Da	ate	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)			Gen	erai	Remarks		
:													
												4.05	
								All dimension	ons in metres		Scale:	1:25	
Met Use			d windov apling	N Plan Use	t Archw d:	ay Comp	etitor	Drilled By:	MOS	Logge By:	d OPengilly	Checked By:	AGS



Contract:			Client:	Window	San	nple:		
NIAB - Pha	ase 1		BDV			WS	S16	
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	07.09.12		14.99	E:543791.0 N:260905.0		1	of	1

	7700			07.03.12		17.	55 E.OTO / S 1.0 14.200500.0	•	01 1
Progress		Sami	oles / T	ests		_		Depth	Material
Window Run	Depth		Туре	Results	Water	Backfill	Description of Strata	(Thick ness)	Graphic Legend
-	0.10-0.20	1	ES	Tub+VL+J			TOPSOIL: Sandy loam occasional fine to medium gravels of flint and chalk. (TOPSOIL)	(0.40)	70.70 7.34.37 34.37
-	-						\ @ 0.3m increase in clay content at base of stratum /	0.40	/ ₂ / ₂ / ₂
-	0.50-0.60	2	D				Orangey-brown slightly mottled with red and occasionally dark grey sandy CLAY with some gravels of angular fine to medium flint and occasional chalk (RIVER TERRACE DEPOSITS - COHESIVE).	(0.50)	
- - -	1.00-1.45	1	SPT	N=12			(RIVER TERRACE DEPOSITS) Orangey-brown fine to coarse predominantly fine to medium SAND with occasional pockets of grey sandy clay. (RIVER TERRACE DEPOSITS)	0.90	
-	-							(0.90)	
	-						@ 1.6m Lense of orangey-brown mottled streaky grey sandy clay. Orangey-brown slightly gravelly SAND. Sand is fine to coarse. Gravels are angular fine to medium,	1.80	· · · · · · · · · · · · · · · · · · ·
-	2.00-2.45	2	SPT(c)	N=28			predominantly fine flint. Occasional subrounded coarse gravels of flint. \((RIVER TERRACE DEPOSITS)\)	2.20	0.0
-	-						Orangey-brown SAND and GRAVEL. Sand is coarse. Gravel is subangular to subrounded fine flint. (RIVER TERRACE DEPOSITS)	(0.00)	
-	-							(0.80)	
_	-							3.00	
-	3.00-3.45 3.00 - 3.00	3 4	SPT(c) ES D	N=28 Tub+VL+J				-	
_	- 0.00	-						-	
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								-	
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	Γ	Orilling Pro	gress and						Can	oral	Domarks		
	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter	Water Depth	General Remarks						
,			(m)	(m)	(mm)	(m)			ble below 2.4 noted at 2.4r		g drilling.		
							P	II dimensi	ons in metres		Scale:	1:25	
	Method Used:		d windov npling	V Plan Used	t Archw a	ay Comp	etitor	Drilled By:	MOS	Logge By:	OPengilly	Checked By:	AGS

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Used:



Contract:			Client:	Window	nple:	ρle:		
NIAB - Pha	ase 1		BDV			W	S17	
Contract Ref:	Date:	Groun	nd Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	10.09.12		13.81	E:543998.0 N:260818.0		1	of	1

Zi)4 09			10.09.12		13.0	61 E.343990.0 N.2000 10.0	ı	OT I
Progress		Sam	ples / 1	Tests	_	∞ - n		Depth	Material
Window Run	Depth	No	Туре	Results	Water	Backfill & Instru-mentation	Description of Strata	(Thick ness)	Graphic
-	- 0.05-0.15 -	1	ES	Tub+VL+J			TOPSOIL: Harvested vegetation over very dark brown organic rich slightly silty clayey SAND with pockets of decomposed organic matter.	0.30)	17 · 2 · 19 · 2 · 19 · 2 · 19 · 2 · 19 · 2 · 19 · 2 · 19 · 2 · 19 · 2 · 2 · 2 · 2 · 2 · 2 · 2 · 2 · 2 ·
- - -	-						(TOPSOIL) Orangey-brown clayey fine SAND with some fine to coarse gravels of angular flint. (RIVER TERRACE DEPOSITS)	(0.30)	
- - - -	1.00-1.45	1	SPT	N=30			Firm to stiff light grey slightly sandy silty CLAY with frequent fine to coarse gravels of angular flint and fine clasts of chalk and with pockets of orangey-brown sand. Occasional rounded pebbles noted. (RIVER TERRACE DEPOSITS)	0.60	X X X X X X X X X X X X X X X X X X X
- - -	1.00-1.45	1 2	D	N-30			@ 1.10m to 1.20m Lense of orangey-brown fine SAND.	1.20	× · · × · · ×
- - - -	- - -						Stiff fissured light grey occasionally mottled with orangey-brown slightly sandy very silty CLAY with some lenses of subangular to subrounded fine to coarse gravels of flint. Occasional dark grey to black carbonaceous inclusions. (GAULT FORMATION)	(0.90)	X X X X X X X X X X X X X X X X X X X
- -	2.00-2.45	2	SPT	N=26			Stiff fissured light grey silty CLAY.	2.10	X X
- - - -	-						(GAULT FORMATION)	(0.90)	X X X
- - -	3.00-3.45	3	SPT	N=42		******		3.00	X
- - -	-							-	
- - -	-							- -	
- - -	-							- -	
- - -	-							- -	
-	-							_	

[Orilling Pro	gress and	Water Ob	servations	3					
Date	Time Borehole Casing Borehole Water Depth (m) (m) (mm) (mm) (mm)									

General Remarks

Borehole remained stable during excavation.
 Water depth at 2.16m bgl.

MOS

1:25 All dimensions in metres Scale:

Tracked window Method Used: sampling

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Plant Archway Competitor Used:

Drilled Ву:

Logged Ву: **OPengilly**

Checked Ву:



Contract:			Client:	Window Sampl				
NIAB - Pha	ase 1		BDV			W	S 18	
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	12.09.12		13.16	E:544122.0 N:260872.0		1	of	1

	7700			12.03.12		10.	10 L.OTT 122.0 11.200012.0		01
Progress		Samp	oles / T	ests	<u>.</u>	=		Depth	Material
Window Run	Depth	No	Туре	Results	Water	Backfill	Description of Strata	(Thick ness)	Graphic Legend
-	0.20-0.30	1	ES	Tub+VL+J			TOPSOIL: Harvested vegetation over dark brown sandy silty CLAY with traces of subangular fine to medium flint. Frequent roots, fine rootlets and decomposing organic matter throughout. (TOPSOIL)	0.37	\(\frac{1}{2}\), \(\frac{1}\), \(\frac{1}\), \(\frac{1}{2}\), \(\frac{1}{2
-	0.70-0.80 0.75-1.00	2 3	ES D	Tub+VL+J			Firm light brown/orangey-brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium flint. Rare fine rootlets to 0.9m depth. Possibly reworked to 0.8m depth. Occasional decomposing organic matter to 1.0m. (RIVER TERRACE DEPOSITS)	(1.08)	
-	1.00-1.45	1	SPT	N=15				_ - -	
-	_							- 1.45	
-	1.50-1.70	4	D				Orangey-brown slightly clayey slightly gravelly SAND. Gravel is subangular to subrounded fine to coarse flint and chert. Sand is predominantly medium. (RIVER TERRACE DEPOSITS)	- - -	
-	2.00-2.45	2	SPT(c)	N=18			@ 1.8m Increase in medium to coarse flint. Onset of subrounded cobbles of flint.	(1.05)	<i></i>
-	-							2.50	
	-						Firm pale grey slightly sandy silty CLAY with traces of subangular fine calcareous nodules. (GAULT FORMATION)	-	x x x x
-	2.80-3.00	5	D					-	X X
-	3.00-3.45	3	SPT	N=10				-	
-	-							(1.95)	x x
- -	_							- - -	× · · ×
-	4.00-4.45	4	SPT	N=9				- -	xx
-	-							4.45	×x

04 26/10/12 - 17:02 OP. 442 437500, Fax: 01442 437550, Web: www.rsk.co.uk.	
AMPLE LOG 25459_NIAB PHASE 1.GPJ - v8_inel Hempstead, Hertfordshire, HP3 9RT. Tel: 01	- - - - -
GINT_LIBRARY_V8_04.GLB!Log WINDOW SA RSK Environment Ltd, 18 Frogmore Road, Hem	Me: Use

ı	Drilling Progress and Water Observations												
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)								

General Remarks

- 1. Sample becoming saturated below 1.6m depth.
- 2. Hole beginning to collapse after 3.0m run.

All dimensions in metres Scale: 1:25

Method Tracked window Jsed: Plant Archway Competitor Used: Drilled By: MOS Logged By: BCoulston Checked By: BY: BCoulston





Contract:			Client:	Window	nple:	ple:		
NIAB - Pha	ase 1		BDV			W	S19	
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	10.09.12		13.59	E:543901.0 N:260978.0		1	of	1

	7700			10.03.12		10.	03 E.070301.0 N.200310.0		01 1
Progress		Sam	oles / T	Tests	fer	Backfill	Description of Obsts	Depth	Material
Window Run	Depth	No	Туре	Results	Water	Вас	Description of Strata	(Thick ness)	Legend
-	0.10-0.20	1	ES	Tub+VL+J			TOPSOIL: Harvested vegetation over dark brown slightly clayey slightly silty fine SAND with fine to medium gravels of angular to subangular flint. (TOPSOIL)	(0.30)	17.34.17.34.17.34.17.34.17.34.17.34.17.34.17.34.17.34.17.34.17.34.17.34.17.34.17.34.17.34.17.34.17.34.17.34.17
-	- - -						Medium dense orangey-brown clayey fine SAND with some angular fine to coarse gravels of flint. (RIVER TERRACE DEPOSITS)	- -	
-	-		OPT	N. 40			@ 0.5m Clay content decreases, onset of fine SAND.	(0.90)	
_	1.00-1.45	1	SPT	N=12				1.20	
-	- -						Medium dense orangey-brown slightly clayey gravelly fine to coarse predominantly fine SAND. Gravels are subangular fine to medium chalk and angular fine to coarse flints. Some dark brown/grey decomposing organic matter.	(0.60)	
-	-						(RÎVER TERRACE DEPOSITS) @ 1.6m Increase in medium to coarse gravel content for predominantly flint.	1.80	
-	2.00-2.45	2	SPT(c)	N=32			Firm light grey mottled with orangey-brown, gravelly sandy CLAY. Gravels are angular fine to medium flints and fine clasts of chalk. (RIVER TERRACE DEPOSITS)	2.00	
-	- - -						Dense orangey-brown SAND and GRAVEL with pockets of stiff grey gravelly clay. Sand is fine to coarse. Gravel is angular fine flint. (RIVER TERRACE DEPOSITS)	(1.00)	
_	_								
_	-		ODT()	N. 50				3.00	
-	3.00-3.45	3	SPT(c)	N=53				-	
-	- -							-	
-	- -							-	
-	- -							-	
-	 - -							-	
_	- -							-	
_	- -							-	

[Orilling Pro					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	1 Darahala ramaina
						Borehole remained Water seepage no Water level at 2.16
						All dimensions

Used:

sampling

General Remarks

Ву:

ed stable during excavation.

MOS

- oted after 2.0m bgl during drilling.
- 16 on completion.

1:25 All dimensions in metres Scale: Plant Archway Competitor **Tracked window** Drilled Checked Method Logged

Ву:

GINT LIBRARY V8 04.GLB!Log WINDOW SAMPLE LOG | 25459 INAB PHASE 1.GPJ - v8 04 | 26/10/12 - 17:02 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 07442 437500, Fax: 01442 437550, Web: www.rsk.co.uk.

Used:



Ву:

OPengilly



Contract:			Client:	Client:				
NIAB - Ph	ase 1		BDV			W	S20	
Contract Ref:	Date:	Grour	nd Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	11.09.12		12.80	E:544098.0 N:260973.0		1	of	1

	20-700 11.00.12		12.00		•	01 1			
Progress	Progress Samples / Tests		Tests	_	- =		Denth	Material	
Window Run	Depth	No	Туре	Results	Water	Backfill	Description of Strata	(Thick ness)	
-	0.10-0.20	1	ES	Tub+VL+J			TOPSOIL: Grass and harvested vegetation over dark brown slightly gravelly very sandy clayey TOPSOIL. Sand is predominantly fine to medium. Gravel is subangular to subrounded fine to coarse flint. Frequent roots and decomposing organic matter. (TOPSOIL)	0.50	1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2
_	0.50-0.70	3	D				@ 0.35m Becomes light brown with a reduction in	-	<u> </u>
-	0.60-0.70	2	ES	Tub+VL+J			sand conent.	(0.45)	
-	- - 1.00-1.45 1.00-1.20	1 4	SPT(c) D	N=17			Firm light brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular medium flint. Fine gravel-sized lenses of decomposing organic matter throughout. Occasional fine rootlets to 0.8m. (RIVER TERRACE DEPOSITS)	- 0.95 - - (0.40)	
	_						@ 0.85m Increase in sand and gravel content.	4.05	9.00
	1.50-1.70	5	D				Medium dense orangey-brown clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse flint. (RIVER TERRACE DEPOSITS)	(0.45)	
	- - -						Firm light brown/orangey-brown gravelly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium flin. (RIVER TERRACE DEPOSITS)	1.80	
-		2 6	SPT(c) D	N=18			Medium dense slightly clayey slightly gravelly SAND. Gravel is subangular to subrounded fine to medium flint. Sand is predominantly medium. (RIVER TERRACE DEPOSITS)	-	θ- Δ. - Θ Θ.
_	2.50	7	ES	Tub+VL+J					
-	- -						@ 2.65 to 2.85m Horizon of sandy gravelly clay.	(2.10)	
-	3.00-3.45 - - -	3	SPT(c)	(N=15			@ 3.0m Reduction in clay content to a gravelly SAND.	- - -	
-	-						Firm pale grey slightly sandy silty CLAY. Sand is fine.	3.90	
	- 4.00-4.45 -	4	SPT	N=11			(GAULT FORMATION)	(0.55)	XX
-	-							4.45	× ×

Method	Tracked	d windo	w Plan	t Archw	ay Co
Date	Time	Depth (m)	Depth (m)	Diameter (mm)	Depth (m)
		Borehole	Casing	bservations	Wate
	_				

sampling

Used:

General Remarks

- 1. Sample becoming saturated below 1.6m bgl.
- 2. Hole unstable and colapsing below 3.0m bgl.
- 3. Water level at 2.35m bgl on completion.

1:25 All dimensions in metres Scale: **Plant Archway Competitor** Drilled Checked Logged Ву: By: By: MOS **BCoulston**

GINT_LIBRARY_V8_04.GLBIL.og WINDOW SAMPLE LOG | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 17:02 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.ulk.



Contract:			Client:	Window	nple:	ple:		
NIAB - Pha	ase 1		BDV			W	S21	
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	12.09.12		12.36	E:543981.0 N:261141.0		1	of	1

				.2.001.2				-	o. .
Progress		Sam	ples / T	Tests	ī	≣	Depth		
Window Run	Depth	No	Туре	Results	Water	Backfill	Description of Strata	(Thick ness)	Graphic Legend
-	- 0.05-0.15 0.10-0.25	1 2	ES D	Tub+VL+J			TOPSOIL: Low-rise shrub vegetation and harvested crop remains over dark brown sandy silty clayey TOPSOIL with traces of subangular fine to medium flint. Roots/rootlets and decomposing organic matter throughout. (TOPSOIL)	0.30	1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2 1/2
-	0.70-0.80 0.80-1.00	3 4	ES D	Tub+VL+J			Firm orangey-brown sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to medium flint. (RIVER TERRACE DEPOSITS)	(0.70)	
_			ODT	N-40			Eight (1) Clay	1.00	
-	1.20-1.40	5	SPT D	N=16			Firm brown/pale grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse predominantly fine to medium flint and chalk. Occasional calcareous inclusions and decomposing organic matter. (RIVER TERRACE DEPOSITS)	- - (0.65)	
-	-							1.65	
-	-						Medium dense light brown/orangey-brown slightly clayey gravelly SAND. (RIVER TERRACE DEPOSITS)	-	
-	2.00-2.45	2	SPT(c)	N=17				2.50	<i>b</i>
-	2.50-3.00	6	D				Firm pale grey slightly sandy silty CLAY with traces of subangular fine white flint. Sand is fine. (GAULT FORMATION)	-	X X X X X X X X X X X X X X X X X X X
-	3.00-3.45	3	SPT	N=10				(0.95)	x _ x x _ x x _ x
-	-							-	x x
-	-							_	
-	-							- -	
-	-							-	
								-	

[Drilling Progress and Water Observations												
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)								
						2.							

sampling

Used:

General Remarks

By:

Ву:

BCoulston

- 1. Sample becoming saturated below 2.2m depth.
- 2. Borehole remained stable during excavation.

MOS

 Method
 Tracked window
 Plant Archway Competitor
 Drilled
 Logged
 Checked

Ву:

GINT_LIBRARY_V8_04.GLBIL.og WINDOW SAMPLE LOG | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 17:02 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.ulk.



AGS

Contract:			Client:	Client:				
NIAB - Ph	ase 1		BDV			W	S22	
Contract Ref:	Date:	Grour	nd Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	12.09.12		12.47	E:544165.0 N:261044.0		1	of	1

	7700			12.03.12		14.	±1		01 1
Progress	Progress Sam		ples / Tests		_	=		Denth	Material
Window Run	Depth	No	Туре	Results	Water	Backfill	Description of Strata	(Thick ness)	Graphic
-	0.20-0.30	1 2	ES	Tub+VL+J			MADE GROUND: Low-rise shrub vegetation and harvested crop remains over dark brown slightly gravelly very sandy CLAY. Sand is predominantly fine to medium. Gravel is subangular to subrounded fine to medium flint. Occasional fragments of charcoal and subangular fine brick/pottery. Rootlets and decomposing organic matter throughout.	0.40	
-	0.70-1.00	3	D				(MADE GROUND) MADE GROUND: Firm light brown slightly gravelly	0.65	
-	1.00-1.45		SPT(c)	N=14			slightly sandy CLAY. Gravel is predominantly subangular fine to medium flint with occasional fragments of charcoal and decomposing organic matter. Rare fragments of ceramics and decomposing wood with rootlets throughout. (MADE GROUND)	_	
-	1.50-2.00	4	D				Orangey-brown slightly clayey very sandy GRAVEL. Sand is fine to coarse. Gravel is predominantly recovered as subangular fine to medium flint. (RIVER TERRACE DEPOSITS) @ 1.3m Becomes a SAND and GRAVEL. @ 1.5m Slight increase in clay content.	-	
	2.00-2.45	2	SPT(c)	N=25				(2.80)	
-	3.00-3.45	3	SPT(c)	N=36			@ 2.2m Reduction in gravel content	- 3.45	
-	- - - - - - - -							-	

2	[Orilling Pro	gress and	Water Ol	oservations	3	General Remarks					
2	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter	Water Depth			Gene	erai	Remarks	
וופות בומ, וס ריספיוסים ייספי			(m)	(m)	(mm)	(m)	2. Casii 3. Term	ng could no nionated at	ng saturated to the driven be 3.45 due to do .2m on compl	elow 1.5 ensity.		
5							P	All dimensio	ns in metres		Scale:	1:25
	Method Used:		d windov npling	V Plan Use	t Archw d:	ay Comp	etitor	Drilled By:	MOS	Logge By:	BCoulston	Checked By:

GINT_LIBRARY_V8_04.GLBIL.og WINDOW SAMPLE LOG | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 17:03 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.ulk.



Contract:			Client:	Window	San	nple:		
NIAB - Pha	ase 1		BDV			WS	S23	
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	12.09.12		12.03	E:544117.0 N:261186.0		1	of	1

25459		12.09.12			12.03 E.344117.0 N.201100.0		I	OT I	
Progress		Sam	pples / Tests		ter	Backfill	Description of Charte	Depth	
Window Run	Depth	No	Туре	Results	Water	Вас	Description of Strata	(Thick ness)	Legend
- - -	0.10-0.20	1	ES	Tub+VL+J			TOPSOIL: Harvested vegetation over dark brown sandy CLAY with traces of subangular fine to medium flint. Roots/rootlets and decomposing organic matter throughout. (TOPSOIL)	- - 0.22 -	1/ · ½ · ½ · ½ · ½ · ½ · ½ · ½ · ½ · ½ ·
- - -	0.50-0.60	2 3	ES D	Tub+VL+J			Firm light brown/orangey brown sandy gravelly CLAY. Sand is predominantly medium. Gravel is subangular to subrounded fine to coarse predominantly medium to coarse flint. (RIVER TERRACE DEPOSITS)	- (0.88) - -	
-	1.00-1.45	1	SPT	N=20			@ 0.65m Becomes mottled with pale grey @ 0.9m Increase in gravel content of predominantly _	- - 1.10	<u> </u>
- 	-						medium to coarse flint.	-	.o
-	1.40-1.70	4	D				Medium dense orangey brown slightly clayey slightly gravelly SAND. Gravel is subangular to subrounded fine flint and chert. Sand is predominantly medium to coarse. (RIVER TERRACE DEPOSITS)	- - -	
- - -	_						@ 1.3m to 1.5m Occasional medium to coarse gravel sized inclusions of pale grey sandy clay.	-	######################################
	2.00-2.45	2	SPT(c)	N=15				(1.75) -	
-	2.20-2.50	5	D				@ 2.2m Becoming SAND and GRAVEL.	- - - -	0
-	-							2.85	<u>- ∅</u> <u>- ⊘</u>
- -	- 2.85-3.00 - 3.00-3.45	6	D SPT	N=17			Stiff pale grey very sandy silty CLAY. Sand is fine. (GAULT FORMATION)	- -(0.35)	× × ×
-								3.20	<u> </u>
- - - -	-						Brown/grey slightly clayey slightly gravelly SAND. Gravel is subangular fine flint. Sand is fine to coarse, predominantly medium. (Possibly partly backfilled from upper strata at terminal depth).	- - (0.80) -	
- - -	4.00-4.45	4	SPT(c)	N=19				4.00	
-	-							-	

[Orilling Pro	gress and	Water Ob	oservations	3	ı
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	L
		()	()	,		2
						3

General Remarks

Sample becoming saturated below 1.5m depth.
 Water level at 2.55m on completion.
 Terminated at 4m due to instability and backfill - backfill at terminal depth

1:25 All dimensions in metres Scale: Drilled Logged MOS

Tracked window Method Used: sampling

GINT LIBRARY V8 04.GLB!Log WINDOW SAMPLE LOG | 25459 INAB PHASE 1.GPJ - v8 04 | 26/10/12 - 17:03 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 07442 437500, Fax: 01442 437550, Web: www.rsk.co.uk.

Plant Archway Competitor Used:

Ву:

BCoulston

Checked Ву:





Contract:			Client:	Window	nple:			
NIAB - Pha	ase 1		BDV			W	S24	
Contract Ref:	Date:	Groun	nd Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	10.09.12		15.63	E:543884.0 N:260684.0		1	of	1

20700 10.03.12					10.00				01 1		
Progress	Progress Samples / Tests				-	=		Denth	Material		
Window Run	Depth		Туре	Results	Water	Backfill	Description of Strata	(Thick ness)	Graphic Legend		
-	0.10-0.20	1	ES	Tub+VL+J			MADE GROUND: Dessicated dark brown slightly silty clayey sand with fine to medium gravels of angular to subangular flint. Occasional clasts of fine brick and charcoal. (MADE GROUND)	0.30			
-	0.40-0.50	2	ES	J			Firm dark brown to orange sandy CLAY with some fine to medium angular gravels of flint. Frequent pockets of decomposing organic matter between 0.4m and 0.5m.				
-	0.80 0.90 1.00-1.45	3	D V SPT	c _u =70 N=12			Firm grey mottled pale orange brown slightly sandy slightly silty CLAY with gravels of subangular fine to medium chalk and angular fine to medium flint. Sand is fine. (RIVER TERRACE DEPOSITS)	(0.65)	x x		
-	-						Firm fissured grey mottled with pale orange-yellow silty CLAY. (RIVER TERRACE DEPOSITS) @ 1.4m Onset of firm to stiff clays.	1.30	x		
-	1.70 2.00-2.45 	2	V SPT	c _u =85 N=15			@ 1.9 to 2.0 Lense of medium SAND and medium to coarse GRAVELS within a clay matrix.	- - (1.40) - -	X X X		
-	- - - - - - - - - - - - - - - - - - -	3	SPT	N=15			Stiff pale grey silty CLAY. (GAULT FORMATION)	2.70	X X		
-		3	SFI	14-15				- - - -			
-	- - - -							- - - -			

	[Drilling Pro	gress and	Water Ob	servation	S	General Remarks					
	Date	Time	Borehole Depth	Casing Depth	Borehole Diameter	Water Depth		Gene	erai	Reman	KS	
			(m)	(m)	(mm)	(m)	1. Bore	hole remained dry and st	able dı	uring excava	ation.	
							A	All dimensions in metres		Scale:	1:25	
į	Method	Tracke	d windov	N Plan	t Archw	ay Comp	etitor	Drilled	Logge	ed	Checked	

GINT LIBRARY_V8_04.GLBILog WINDOW SAMPLE LOG | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 17:03 | OP. RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.ulk.

Method Used: Tracked window Sampling Plant Used:

Plant **Archway Competitor** Jsed: Drilled By:

MOS

Logged By: **OPengilly**

Checked By: AGS



Contract:			Client:	Window	nple:	ole:		
NIAB - Pha	ase 1		BDV			W	/SE	
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:			
25459	06.09.12		19.02	E:543603.0 N:260547.0		1	of	1

25459				06.09.12		19.	UZ E.3436U3.U IN.26U347.U	<u> </u>	OT I
Progress		Sam	oles / T	ests	Water	Backfill	Description of Strata	Depth (Thick	Material Graphic
Window Run	Depth	No	Туре	Results	Wa	Ba	·	ness)	Legend
-	0.10-0.20	1	ES	Tub+VL+J			MADE GROUND: Organic sandy slightly silty CLAY with fine to coarse gravels of flint and occasional fine brick clasts. (MADE GROUND)	(0.40)	
-	0.50	2	ES	J			Brown slightly silty sandy CLAY with frequent angular to subangular gravels of flint. (RIVER TERRACE DEPOSITS)	0.40	xx x
-	0.90-1.00	3 1	D SPT(c)	N=29			Medium dense reddish to orangey-brown gravelly fine SAND. Gravel is fine to coarse angular clasts of flint and occasional clasts of subangular chert. (RIVER TERRACE DEPOSITS)	0.80	X X X 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
-	2.00-2.45	2	SPT(c)	N=8				- (2.30) - - - -	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
-	3.00-3.45	3	SPT	N=12			@ 3.0 - 3.1m Lense of orangey-brown SAND and GRAVEL. Sand is predominatly coarse. Gravel is angular fine to coarse flint. Soft to firm thinly laminated grey mottled orangey-brown slightly silty sandy CLAY with some fine to medium	3.10	0.000000000000000000000000000000000000
-	4.00-4.45	4	SPT	N=11			gravels of flint and chalk. (RIVER TERRACE DEPOSITS) Stiff fissured dark grey/blue occasionally mottled with pale yellow-brown silty CLAY with some inclusions of fine decomposed rootlets up to 10mm in length and 3mm in thickness. (GAULT FORMATION)	3.60	X X X X X X X X X X X X X X X X X X X

Method	Tracke	d windo	v Pla	nt Archw	ay Com	petitor
						3. Wat
						back 2. Refu
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	1. Drilli
[Orilling Pro		Water C	bservation	s	
			•	•	'	
-	-					

sampling

Used:

General Remarks

- 1. Drilling to 2.0m observed to be slow. Low CPT N value is associated with backfill, rather than in-situ conditions.
- 2. Refusal after 4.5m due to hole instability.
- 3. Water seepage at approximately 3m.

All dimensions in metres Scale: 1:25

| Drilled | Logged By: | OPengilly | By: | OPengilly | By: | OPengilly | OPe





Contract:			Client:	Window	nple:	ile:			
NIAB - Pha	ase 1		BDV			W	VS	Ε	
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:				
25459	06.09.12		18.16	E:543469.0 N:260550.0		1	of	2	<u> </u>

25459 06				06.09.12		10.	10 E.343409.0 N.200330.0	<u> </u>	or Z
Progress		Sam	oles / T	ests	Water	Backfill	Description of Strata	Depth (Thick	
Window Run	Depth	No	Туре	Results	M	Ba	·	ness)	
-	0.10-0.20	1	ES	Tub+VL+J			MADE GROUND: Dark brown organic slightly sandy CLAY with fine gravels of brick, flint and chalk. (MADE GROUND)	0.25	
	0.50	2	D				Firm brown mottled with red-brown slightly sandy CLAY with occasional angular to subangular fine to medium gravels of flint and subrounded fine to medium clasts of chalk.	0.70	
-	1.00-1.45 - 1.00 - 1.00	1 3	SPT D V	N=14 c _u =49			Firm to stiff grey mottled with light brown slightly silty slightly sandy CLAY with occasional putty chalk, gravels of angular fine to coarse flint and subrounded chalk. Sand is fine. (GAULT FORMATION)	-	x x
-	-						@ 1.3m Onset of firm clays becoming fissured. Streaky calcareous inclusions and putty chalk noted throughout strata.	(1.70)	
-	2.00-2.45 2.00	2	SPT V	N=12 c _u =115				2.40	x _ x x _ x x _ x x _ x
-	3.00-3.45	3	SPT	N=14			Stiff fissured dark grey/blue occasionally mottled with pale yellow to brown silty CLAY with some inclusions of fine decomposed wood fragmets up to 10mm in length and 3mm in thickness. (GAULT FORMATION)	- - - - - - -	X X X X X X X X X X X X X X X X X X X
-	- - - 4.00-4.45 - -	4	SPT	N=19			@ 4.0m Selenite crystals noted and fine gravel sized/coarse sand-sized siltstone and calcareous nodules.	(2.60)	X X X X X X X X X X X X X X X X X X X

	Drilling Pro	ogress and	Water Ob	servations	3			Con	orol	Domorko		
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	1. Bore	hole remai			Remarks uring excavation.		
,												
						Α	II dimensi	ons in metres		Scale:	1:25	
Method Used:		d windov npling	V Plan	t Archw	ay Comp	etitor	Drilled By:	MOS	Logge By:	OPengilly	Checked By:	AGS

GINT_LIBRARY_V8_04.GLBILog WINDOW SAMPLE LOG | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 17:03 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.uk.



WINDOW SAMPLE LOG

Contract:							Client:			Windov	v Samp	le:
	NIAB -	Pha	ase 1						V Trading Limited			WSE
Contract Ref:			Date:		Gr	ound	Level	(m AOD):	National Grid Co-ordinate:	Sheet:		
25	5459			06.09.12			18.	16	E:543469.0 N:260550.0		2	of 2
Progress		Sam	ples / T	ests		er	Ktill Ktern Colored				Depth	Material
Window Run	Depth	No	Туре	Results		Water	Backfill		Description of Strata		(Thick ness)	Graphic Legend
	5.00-5.45	5	SPT	N=32				pale yellow fine decom and 3mm in (GAULT FO	ed dark grey/blue occasionally mottle to brown silty CLAY with some inclus sposed wood fragmets up to 10mm in thickness. ORMATION) text copied from layer at 2.40m depondent)	ions of length	5.00	\$X X X X X X X
											-	

	Drilling Progress and Water Observations							Con	orol	Remarks		
Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)			Gen	erai	Remarks		
						A	II dimensio	ons in metres		Scale:	1:25	
Method Used:		d windov npling	Plan Used	t Archw a	ay Comp	etitor	Drilled By:	MOS	Logge By:	d OPengilly	Checked By:	AGS

GINT_LIBRARY_V8_04.GLB!Log WINDOW SAMPLE LOG | 25459_NIAB PHASE 1.GPJ - v8_04 | 26/10/12 - 17:03 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Hertfordshire, HP3 9RT. Tel: 01442 437500, Fax: 01442 437550, Web: www.rsk.co.uk.



GINT LIBRARY V8 04.GLB!Log WINDOW SAMPLE LOG | 25459 INAB PHASE 1.GPJ - v8 04 | 26/10/12 - 17:03 | OP-RSK Environment Ltd, 18 Frogmore Road, Hemel Hempstead, Herifordshire, HP3 9RT. Tel: 07442 437500, Fax: 01442 437550, Web: www.rsk.co.uk.

Method Used:

DRAFT WINDOW SAMPLE LOG

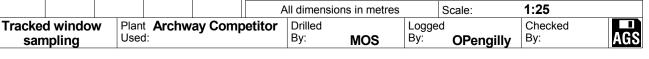
Contract:			Client:	Window	nple:				
NIAB - Pha	ase 1		BDV			W	/SI	Η	
Contract Ref:	Date:	Groun	d Level (m AOD):	National Grid Co-ordinate:	Sheet:				
25459	06.09.12		19.16	E:543567.0 N:260638.0		1	of	1	

2:	5459			06.09.12	19.	16	E:543567.0 N:260638.0		1	of 1
Progress		Sam	ples / ٦	Tests	Water Backfill & Instru-		Description of Strata		Depth (Thick	
Window Run	Depth	No	Туре	Results	Wa Back Ins				ness)	Legend
-	0.20-0.30	1	ES	Tub+VL+J		slightly sil subangula medium o rootlets of (TOPSOIL		ar to ne to quent	0.50	
-	0.50-0.60	2	D			angular to pockets of	rown gravelly sandy CLAY. Gravels subangular fine to coarse flints. Dark decomposing matter noted throughout. ERRACE DEPOSITS)		-	
-	1.00-1.45	1	SPT	N=9			Im Gravels become more rare and ntly fine to medium.	are	- - (1.50) -	
-	1.40-1.60	3	D			@ 1.7m	n Clasts of hard and soft calcareous no	dules	- - -	
-	2.00-2.45	2	SPT	N=33		@ 1.80 medium S. to medium		r fine	2.00	
-	-				•••••	fine to coa coarse pre (RIVER TE	rown SAND and GRAVEL. Gravel is an irse flint and fine chalk clasts. Sand is fi dominantly fine to medium. ERRACE DEPOSITS) jey-brown/grey mottled with orange-red s	ne to	2.50	
-	-					silty CLAY (GAULT F	Sand is predominantly fine. ORMATION) Transition into grey mottled pale yellow	·	3.00	
-	3.00-3.45	3	SPT(c)	N=16			ndy silty CLAY.	-grey	-	
-	-								- -	
-	-								-	
									- -	
-	-								- -	

	[Orilling Pro	gress and	Water Ob	oservations	3	
	Date	Time	Borehole Depth (m)	Casing Depth (m)	Borehole Diameter (mm)	Water Depth (m)	Borehole remaine
,							Soils saturated b Water seepage r
							All dimension

General Remarks

- ned stable during excavation.
- below 2.5m
- noted at 2.4m bgl.





DRAFT WINDOW SAMPLE LOG

	Contract:				Client:		Windo	w Samp	nple:		
		NIAB - Ph	ase 1			BDV	V Trading Limited			W	SM
Ī	Contract Ref:		Date:	Ground	Level	(m AOD):	National Grid Co-ordinate:	Sheet:			
	25	5459	06.09.12		18.	75	E:543512.0 N:260704.0		1	of	1
	Progress	Sam	ples / Tests	L	=				Denth	Ma	ateria

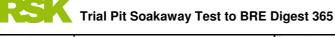
25	0459			06.09.12		18.	/5	E:543512.	U N:260/04.0		1	of 1
Progress		Sam	ples / T	ests	Water	Backfill		Description	n of Strata		Depth	Material Graphic
Window Run	Depth	No	Туре	Results	Wa	Вас					ness)	Legend
	0.10	1	ES	J			Some fine	to coarse grave fine subangular b	vn slightly silty sandy els of subangular fl rick fragments.	CLAY. int and	0.25	
	0.30-0.40	2	ES	Tub+VL+J			Orange to Gravel is fi	dark brown sligi	htly clayey gravelly angular flint and subr	SAND. ounded	0.50	
	0.60-0.80	3	D				angular to	subrounded for cobbles of fling	e gravelly SAND. G ine to coarse flir t. Sand is predon	nt and	(0.50)	
-	1.00-1.17	1	SPT(c)	N=91*							1.00	0 .0
	_										-	
	-										_	
	_										_	
	-										-	
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1	Drilling Pro	gress and	Water Ob	servations	3			Can	امسما	Damanlı		
Date	Time	Borehole Depth	Casing Depth	Borehole Diameter	Water Depth			Gene	erai	Remarks		
Date	Tillic	(m)	(m)	(mm)	(m)	Refusal at terminal depth due to density of soils						
								F		,		
										1	4.05	
						β	dimensi	ons in metres		Scale:	1:25	
Method		d windov	v Plan	t Archw	ay Comp	etitor	Drilled		Logge		Checkec M	1
Used:	san	npling	Use	J:			Ву:	MOS	Ву:	OPengilly	By:	ACE

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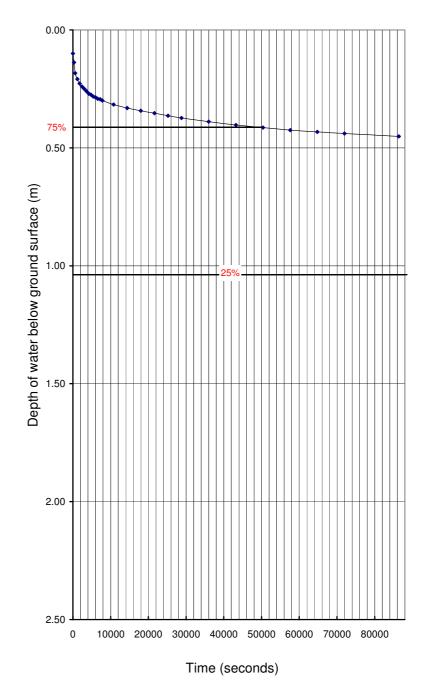
H2 – INFILTRATION TEST RESULTS



Location	TP1 (i)	Test No	Test 1
Client	BDW Trading Limited	Length of Trial Pit (m)	1.45
Job Number	25459	Width of Trial Pit (m)	0.45
Date	28.08.12	Water level at start (mbgl)	0.1
Operator	MOS / OP	Depth to Base of Trial Pit (m)	1.35

Time (Secs)	Water level (mbgl)
0	0.10
300	0.14
600	0.18
1200	0.21
1800	0.23
2400	0.24
3000	0.25
3600	0.26
4200	0.27
4800	0.275
5400	0.282
6000	0.286
6600	0.292
7200	0.294
7800	0.299
10800	0.316
14400	0.331
18000	0.343
21600	0.353
25200	0.364
28800	0.373
36000	0.389
43200	0.403
50400	0.414
57600	0.425
64800	0.43
72000	0.44
86400	0.45
	I

Trial Pit Soakaway Test Results



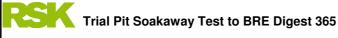
Results

V _{p75-25} (m ³)	-
$a_{p50} (m^2)$	-
t _{p75} (s)	-
t _{p25} (s)	-
t _{p75-25} (s)	-
Infiltration Rate (m/s)	INVALID

Groundwater did not infiltrate past the 25 and 75 percentiles over a 24 hour period.

Figure

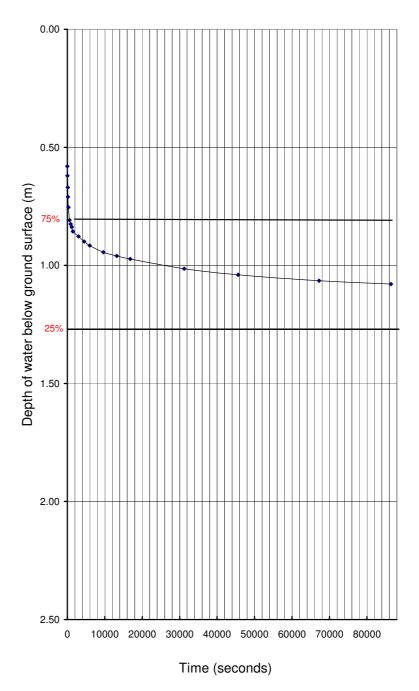
Appendix H



Location	TP2(i)	Test No	Test 1
Client	BDW Trading Limited	Length of Trial Pit (m)	1.1
Job Number	25459	Width of Trial Pit (m)	0.45
Date	28.08.12 - 29.08.12	Water level at start (mbgl)	0.58
Operator	MOS / OP	Depth to Base of Trial Pit (m)	1.50

Time (Secs)	Water level (mbgl)
0	0.58
60	0.62
120	0.67
180	0.71
300	0.754
600	0.808
900	0.825
1200	0.837
1500	0.856
3000	0.877
4500	0.899
6000	0.916
9600	0.944
13200	0.96
16800	0.973
31200	1.014
45600	1.04
67200	1.065
86400	1.079

Trial Pit Soakaway Test Results



Results

V _{p75-25} (m ³)	-
a _{p50} (m²)	-
t _{p75} (s)	-
t _{p25} (s)	-
t _{p75-25} (s)	-
Infiltration Rate (m/s)	INVALID

Groundwater did not infiltrate past the 25 and 75 percentiles over a 24 hour period.

Figure

Appendix H

Location	TP3 (i)	Test No	Test 1
Client	BDW Trading Limited	Length of Trial Pit (m)	1.55
Job Number	25459	Width of Trial Pit (m)	0.45
Date	29.08.12 - 30.08.12	Water level at start (mbgl)	0.25
Operator	MOS	Depth to Base of Trial Pit (m)	1.15

Time (Secs)	Water level (mbgl)	Trial Pit Soakaway Test Results
0	0.25	That I it Council at I could
60	0.26	
120	0.28	0.00
180	0.29	
240	0.31	
300	0.31	
600	0.327	
900	0.345	
1200	0.359	
1500	0.371	
1800	0.39	
2100	0.39	
2400	0.398	
2700	0.407	‡
3000	0.415	±
3300	0.428	
9900	0.489	_E_
13500	0.525	
17100	0.551	8 <u> </u>
20700	0.57	<u>, </u>
24300	0.586	5
31500	0.61	$\underline{\sigma}$
38700	0.631	Depth of water below ground surface (m) 25% 25% 25% 25% 25% 25% 25% 25
45900	0.647	0.50
53100	0.66	<u>5</u>
60300	0.67	<u>o</u>
67500	0.69	
74700	0.70	<u> </u>
81900	0.70	ă
89100	0.711	
		ate
		%
		<u>-</u>
		9
		
		Θ \square
		25%
		1.00 -
		0 10000 20000 30000 40000 50000 60000 70000 80000 900
		Time (seconds)

Results	
V _{p75-25} (m ³)	-
$a_{p50} (m^2)$	-
t _{p75} (s)	-

 $\begin{array}{cccc} t_{p75}\left(s\right) & & - \\ t_{p25}\left(s\right) & & - \\ t_{p75-25}\left(s\right) & & - \\ \\ Infiltration Rate\left(m/s\right) & & INVALID TEST \end{array}$

Groundwater did not infiltrate past the 25 and 75 percentiles over a 24 hour period.

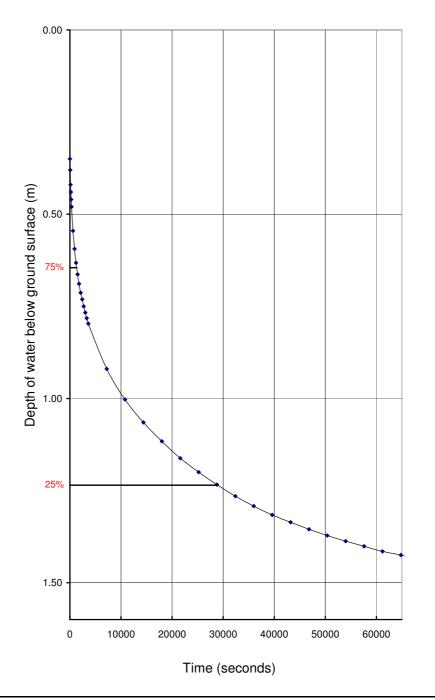
ASSUMED 30% POROSITY OF BACKFILL SHINGLE

Inferred infiltration calculated at <1.86E-07

Location	TP4 (i)	Test No	Test 1
Client	BDW Trading Limited	Length of Trial Pit (m)	1.29
Job Number	25459	Width of Trial Pit (m)	0.45
Date	30.08.12 - 31.08.12	Water level at start (mbgl)	0.35
Operator	MOS / OP / BC	Depth to Base of Trial Pit (m)	1.53

Time (Secs)	Water level
(2000)	(mbgl)
0	0.35
60	0.38
120	0.42
180	0.44
240	0.46
300	0.48
600	0.545
900	0.594
1200	0.632
1500	0.663
1800	0.689
2100	0.713
2400	0.731
2700	0.75
3000	0.767
3300	0.782
3600	0.797
7200	0.92
10800	1.003
14400	1.065
18000	1.116
21600	1.162
25200	1.2
28800	1.234
32400	1.265
36000	1.29
39600	1.32
43200	1.34
46800	1.36
50400	1.372
54000	1.387
57600	1.401
61200	1.415
64800	1.425
68400	1.437
72000	1.448
75600	1.45
	l

Trial Pit Soakaway Test Results



Results

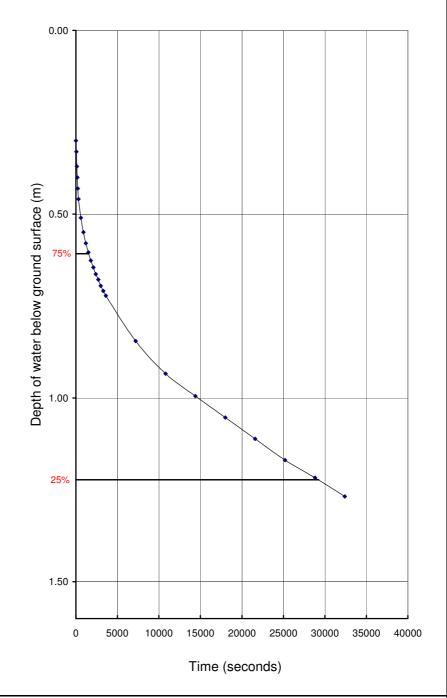
V _{p75-25} (m ³)	0.10
$a_{p50} (m^2)$	2.63
t _{p75} (s)	1350.00
t _{p25} (s)	29000.00
t _{p75-25} (s)	27650.00
Infiltration Rate (m/s)	1.41E-06

Calculations based on 30% pososity of backfill shingle

Location	TP4 (i)	Test No	Test 2
Client	BDW Trading Limited	Length of Trial Pit (m)	1.29
Job Number	25459	Width of Trial Pit (m)	0.45
Date	31.08.12	Water level at start (mbgl)	0.3
Operator	MOS	Depth to Base of Trial Pit (m)	1.53

Time (Secs)	Water level (mbgl)
0	0.30
60	0.33
120	0.37
180	0.40
240	0.43
300	0.459
600	0.51
900	0.549
1200	0.579
1500	0.604
1800	0.626
2100	0.645
2400	0.663
2700	0.678
3000	0.695
3300	0.709
3600	0.722
7200	0.845
10800	0.934
14400	0.995
18000	1.053
21600	1.111
25200	1.169
28800	1.217
32400	1.268

Trial Pit Soakaway Test Results



Results

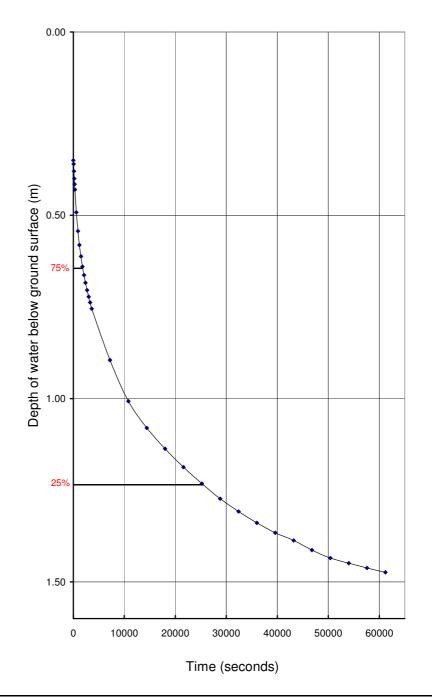
V _{p75-25} (m ³)	0.11
a _{p50} (m ²)	2.72
t _{p75} (s)	1550.00
t _{p25} (s)	29250.00
t _{p75-25} (s)	27700.00
Infiltration Rate (m/s)	1.42E-06

Calculations based on 30% pososity of backfill shingle

Location	TP4 (i)	Test No	Test 3
Client	BDW Trading Limited	Length of Trial Pit (m)	1.29
Job Number	25459	Width of Trial Pit (m)	0.45
Date	03.09.12	Water level at start (mbgl)	0.35
Operator	MOS / BC	Depth to Base of Trial Pit (m)	1.53

Time (Secs)	Water level (mbgl)
0	0.35
60	0.36
120	0.38
180	0.40
240	0.42
300	0.43
600	0.492
900	0.543
1200	0.581
1500	0.612
1800	0.64
2100	0.663
2400	0.684
2700	0.704
3000	0.722
3300	0.738
3600	0.755
7200	0.895
10800	1.007
14400	1.08
18000	1.137
21600	1.187
25200	1.232
28800	1.273
32400	1.308
36000	1.34
39600	1.37
43200	1.39
46800	1.41
50400	1.435
54000	1.449
57600	1.462
61200	1.474

Trial Pit Soakaway Test Results



Results

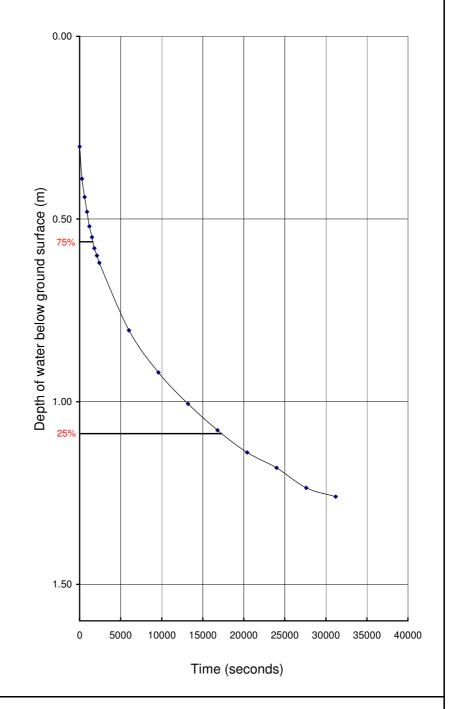
$V_{p75-25} (m^3)$	0.10
a _{p50} (m ²)	2.63
t _{p75} (s)	1800.00
t _{p25} (s)	25400.00
t _{p75-25} (s)	23600.00
Infiltration Rate (m/s)	1.65E-06

Calculations based on 30% pososity of backfill shingle

Location	TP5 (i)	Test No	Test 1
Client	BDW Trading Limited	Length of Trial Pit (m)	1.41
Job Number	25459	Width of Trial Pit (m)	0.45
Date	29.08.12	Water level at start (mbgl)	0.3
Operator	MOS / OP	Depth to Base of Trial Pit (m)	1.35

Time (Secs)	Water level (mbgl)
0	0.30
300	0.39
600	0.44
900	0.48
1200	0.52
1500	0.55
1800	0.58
2100	0.6
2400	0.62
6000	0.805
9600	0.92
13200	1.006
16800	1.078
20400	1.139
24000	1.181
27600	1.236
31200	1.26
	1

Trial Pit Soakaway Test Results



Results

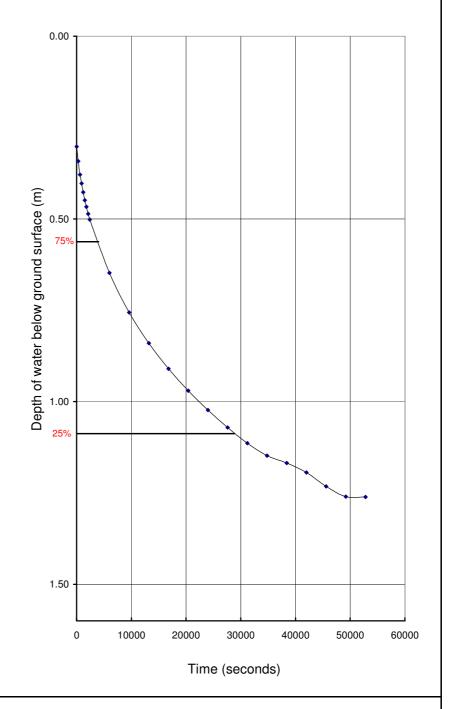
$V_{p75-25} (m^3)$	0.10
a _{p50} (m ²)	2.59
t _{p75} (s)	1600.00
t _{p25} (s)	17275.00
t _{p75-25} (s)	15675.00
Infiltration Rate (m/s)	2.46E-06

Calculations based on 30% pososity of backfill shingle

Location	TP5 (i)	Test No	Test 2
Client	BDW Trading Limited	Length of Trial Pit (m)	1.41
Job Number	25459	Width of Trial Pit (m)	0.45
Date	30.08.12 - 31.08.12	Water level at start (mbgl)	0.3
Operator	MOS / OP	Depth to Base of Trial Pit (m)	1.35

Time (Secs)	Water level (mbgl)
0	0.30
300	0.34
600	0.38
900	0.40
1200	0.43
1500	0.449
1800	0.467
2100	0.486
2400	0.502
6000	0.648
9600	0.756
13200	0.84
16800	0.91
20400	0.97
24000	1.023
27600	1.071
31200	1.114
34800	1.148
38400	1.168
42000	1.194
45600	1.232
49200	1.26
52800	1.261

Trial Pit Soakaway Test Results



Results

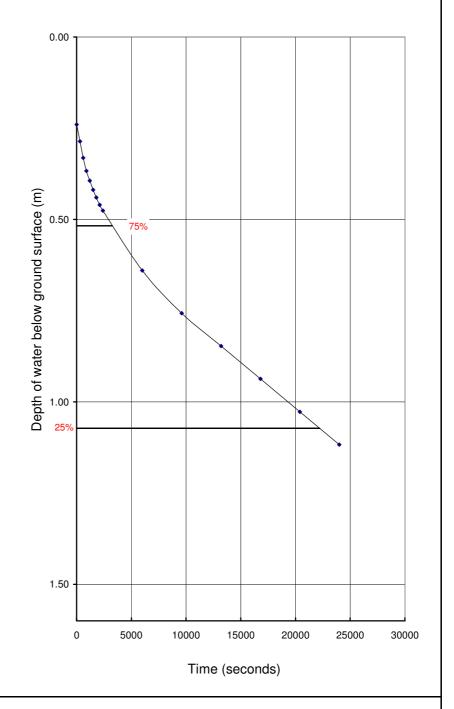
V_{p75-25} (m ³)	0.10
a _{p50} (m ²)	2.59
t _{p75} (s)	4000.00
t _{p25} (s)	28850.00
t _{p75-25} (s)	24850.00
Infiltration Rate (m/s)	1.55E-06

Calculations based on 30% pososity of backfill shingle

Location	TP5 (i)	Test No	Test 3
Client	BDW Trading Limited	Length of Trial Pit (m)	1.41
Job Number	25459	Width of Trial Pit (m)	0.45
Date	31.08.12	Water level at start (mbgl)	0.24
Operator	MOS	Depth to Base of Trial Pit (m)	1.35

Time (Secs)	Water level (mbgl)
0	0.24
300	0.29
600	0.33
900	0.37
1200	0.39
1500	0.419
1800	0.44
2100	0.46
2400	0.476
6000	0.64
9600	0.757
13200	0.847
16800	0.937
20400	1.027
24000	1.117

Trial Pit Soakaway Test Results



Results

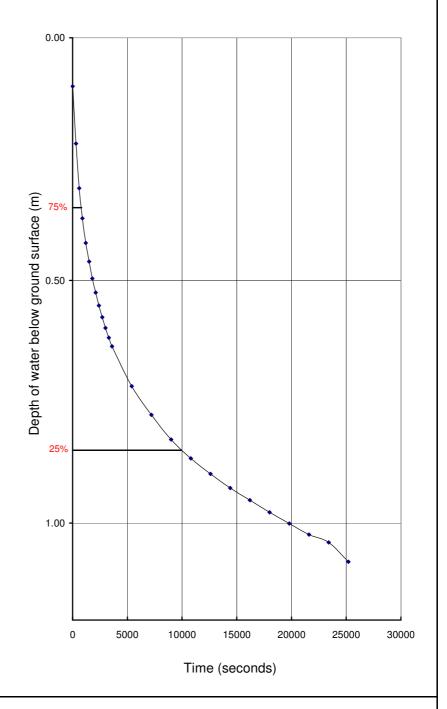
V_{p75-25} (m ³)	0.11
a _{p50} (m ²)	2.70
t _{p75} (s)	3250.00
t _{p25} (s)	22200.00
t _{p75-25} (s)	18950.00
Infiltration Rate (m/s)	2.07E-06

Calculations based on 30% pososity of backfill shingle Red text denotes inferred data

Location	TP6 (i)	Test No	Test 1
Client	BDW Trading Limited	Length of Trial Pit (m)	1.35
Job Number	25459	Width of Trial Pit (m)	0.45
Date	30.08.12	Water level at start (mbgl)	0.1
Operator	MOS	Depth to Base of Trial Pit (m)	1.10

Time (Secs)	Water level (mbgl)
0	0.10
300	0.22
600	0.31
900	0.37
1200	0.42
1500	0.461
1800	0.496
2100	0.525
2400	0.552
2700	0.576
3000	0.598
3300	0.618
3600	0.636
5400	0.718
7200	0.777
9000	0.828
10800	0.867
12600	0.899
14400	0.928
16200	0.953
18000	0.978
19800	1.001
21600	1.024
23400	1.04
25200	1.08

Trial Pit Soakaway Test Results



Results

V_{p75-25} (m ³)	0.09
a _{p50} (m ²)	2.41
t _{p75} (s)	825.00
t _{p25} (s)	9950.00
t _{p75-25} (s)	9125.00
Infiltration Rate (m/s)	4.15E-06

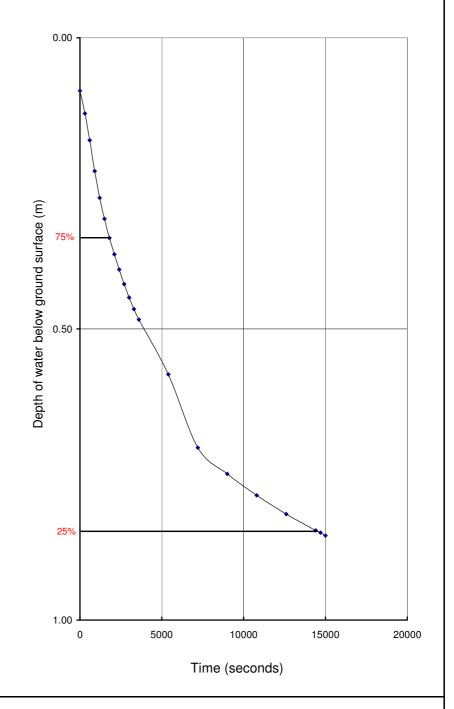
Calculations based on 30% pososity of backfill shingle

Trial Pit Soakaway Test to BRE Digest 365 Location TP6 (i) Test No Client BDW Trading Limited Length of Trial Pit (m)

Location	1 P6 (I)	rest No	Test 2
Client	BDW Trading Limited	Length of Trial Pit (m)	1.35
Job Number	25459	Width of Trial Pit (m)	0.45
Date	31.08.12	Water level at start (mbgl)	0.091
Operator	MOS	Depth to Base of Trial Pit (m)	1.10

Time (Secs)	Water level (mbgl)
0	0.09
300	0.13
600	0.18
900	0.23
1200	0.28
1500	0.311
1800	0.344
2100	0.372
2400	0.398
2700	0.423
3000	0.446
3300	0.466
3600	0.484
5400	0.578
7200	0.704
9000	0.749
10800	0.786
12600	0.818
14400	0.846
14700	0.85
15000	0.855
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Trial Pit Soakaway Test Results



Results

V _{p75-25} (m ³)	0.09
$a_{p50} (m^2)$	2.42
t _{p75} (s)	1850.00
t _{p25} (s)	14500.00
t _{p75-25} (s)	12650.00
Infiltration Rate (m/s)	3.00E-06

Calculations based on 30% pososity of backfill shingle

Trial Pit Soakaway Test to BRE Digest 365 Location Test No TP6 (i) Test 3 Length of Trial Pit (m) Width of Trial Pit (m) Water level at start (mbgl) Depth to Base of Trial Pit (m) Client BDW Trading Limited 1.35 Job Number 25459 0.45 Date 03.09.12 MOS / BC

Operator

Time (Secs)	Water level (mbgl)		Trial	Dit Soakawa	y Test Result		
0	0.00		IIIaii	i it Soakawa	y restriesuit	5	
60	0.14						
120	0.15						
180	0.16	0.00					1
240	0.18						
300	0.2						
600	0.24						
900	0.531						
1200	0.625						
1500	0.687	l l					
1800	0.738	i k					
2100	0.779	1					
2400	0.817	I					
2700	0.848	i ' '	\				
3000	0.879		\				
3300	0.905						
3600	0.929	<u>75%</u>	†				
3900	0.95	[E					
4200	0.971						
4500	0.99	l g l					
4800	1.006	 2					
5100	1.024	5					
5400	1.041						
5700	1.053	2					
6000	1.066	1 Z 1					
6300	1.08	\frac{1}{2}					
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Results	
V _{p75-25} (m ³)	0.10
a _{p50} (m ²)	2.59
t _{p75} (s)	725.00
t _{p25} (s)	2525.00
t _{p75-25} (s)	1800.00
Infiltration Rate (m/s)	2.15E-05

Calculations based on 30% pososity of backfill shingle

Figure Appendix H

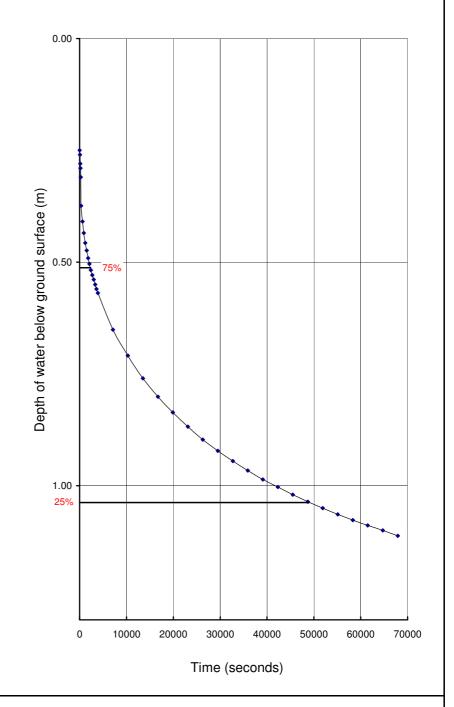
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Location	TP7 (i)	Test No	Test 1
Client	BDW Trading Limited	Length of Trial Pit (m)	1.32
Job Number	25459	Width of Trial Pit (m)	0.45
Date	03.09.12	Water level at start (mbgl)	0.25
Operator	MOS / BC	Depth to Base of Trial Pit (m)	1.30

Time (Secs)	Water level (mbgl)
0	0.25
60	0.26
120	0.28
180	0.29
240	0.31
300	0.374
600	0.409
900	0.435
1200	0.457
1500	0.474
1800	0.491
2100	0.504
2400	0.518
2700	0.529
3000	0.539
3300	0.55
3600	0.56
3900	0.569
7100	0.651
10300	0.709
13500	0.76
16700	0.801
19900	0.836
23100	0.868
26300	0.897
29500	0.92
32700	0.95
35900	0.97
39100	0.99
42300	1.003
45500	1.020
48700	1.036
51900	1.050
55100	1.064
58300	1.077
61500	1.089
64700	1.10
67900	1.112

Trial Pit Soakaway Test Results



Results

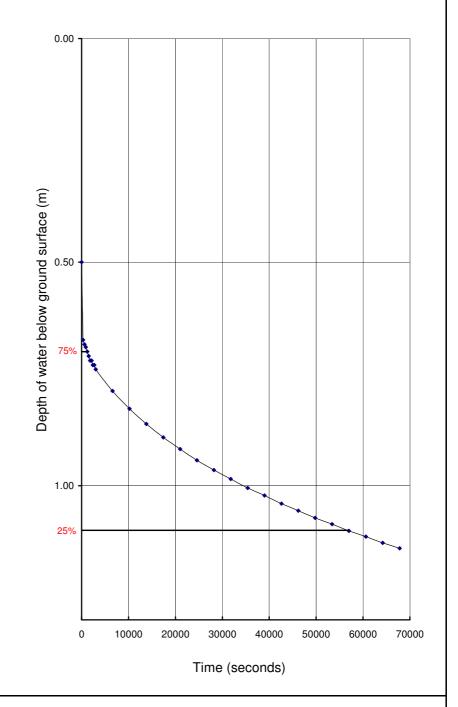
V_{p75-25} (m ³)	0.09
a _{p50} (m ²)	2.45
t _{p75} (s)	2350.00
t _{p25} (s)	49000.00
t _{p75-25} (s)	46650.00
Infiltration Rate (m/s)	8.18E-07

Calculations based on 30% pososity of backfill shingle

Location	TP7 (i)	Test No	Test 2
Client	BDW Trading Limited	Length of Trial Pit (m)	1.32
Job Number	25459	Width of Trial Pit (m)	0.45
Date	04.09.12 - 05.09.12	Water level at start (mbgl)	0.5
Operator	MOS / BC	Depth to Base of Trial Pit (m)	1.30

Time (Secs)	Water level (mbgl)
0	0.50
300	0.67
600	0.68
900	0.69
1200	0.70
1500	0.71
1800	0.72
2100	0.72
2400	0.73
2700	0.73
3000	0.74
6600	0.788
10200	0.828
13800	0.862
17400	0.892
21000	0.918
24600	0.943
28200	0.965
31800	0.985
35400	1.005
39000	1.022
42600	1.04
46200	1.056
49800	1.072
53400	1.086
57000	1.10
60600	1.11
64200	1.13
67800	1.14
	l .

Trial Pit Soakaway Test Results



Results

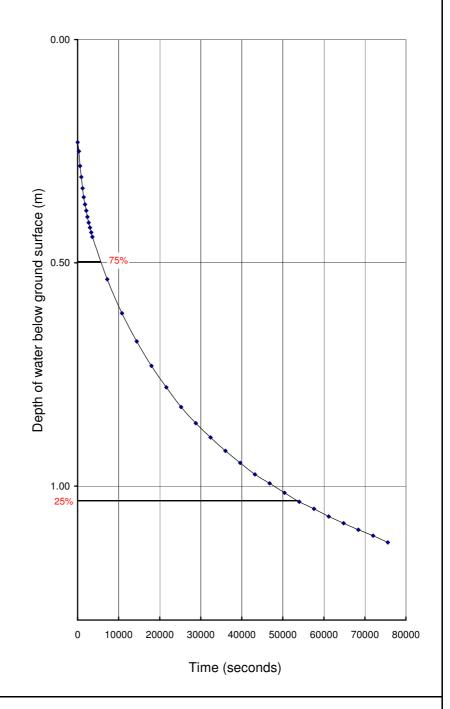
V _{p75-25} (m ³)	0.07
$a_{p50} (m^2)$	2.01
t _{p75} (s)	1400.00
t _{p25} (s)	56950.00
t _{p75-25} (s)	55550.00
Infiltration Rate (m/s)	6.38E-07

Calculations based on 30% pososity of backfill shingle

Location	TP7 (i)	Test No	Test 3
Client	BDW Trading Limited	Length of Trial Pit (m)	1.32
Job Number	25459	Width of Trial Pit (m)	0.45
Date	05.09.12 - 06.09.12	Water level at start (mbgl)	0.23
Operator	MOS	Depth to Base of Trial Pit (m)	1.30

Time (Secs)	Water level (mbgl)
0	0.23
300	0.25
600	0.28
900	0.31
1200	0.33
1500	0.353
1800	0.369
2100	0.383
2400	0.397
2700	0.41
3000	0.421
3300	0.432
3600	0.442
7200	0.537
10800	0.613
14400	0.676
18000	0.731
21600	0.779
25200	0.823
28800	0.859
32400	0.891
36000	0.921
39600	0.948
43200	0.974
46800	0.994
50400	1.02
54000	1.04
57600	1.05
61200	1.07
64800	1.083
68400	1.098
72000	1.111
75600	1.126

Trial Pit Soakaway Test Results



Results

V _{p75-25} (m ³)	0.10
$a_{p50} (m^2)$	2.49
t _{p75} (s)	5475.00
t _{p25} (s)	53500.00
t _{p75-25} (s)	48025.00
Infiltration Rate (m/s)	7.98E-07

Calculations based on 30% pososity of backfill shingle

Location	TP8 (i)	Test No	Test 1
Client	BDW Trading Limited	Length of Trial Pit (m)	1.4
Job Number	25459	Width of Trial Pit (m)	0.45
Date	03.09.12 - 04.09.12	Water level at start (mbgl)	0.45
Operator	MOS / BC	Depth to Base of Trial Pit (m)	1.30

600 900 1200 1200 1500 1800 2400 2700 3000 3300 3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	0.45 0.52 0.55 0.59 0.63 0.664 0.744 0.802 0.844 0.877 0.904 0.926 0.943 0.96 0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05 1.056	Depth of water below ground surface (m)	0.00 -			Soakaway	rost ne	Julio	
120 180 240 300 600 900 1200 1500 1800 2100 2400 2700 3000 3300 3300 3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	0.55 0.59 0.63 0.664 0.744 0.802 0.844 0.877 0.904 0.926 0.943 0.96 0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
180 240 300 600 900 1200 1500 1800 2100 2400 2700 3000 3300 3600 3900 4200 4500 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	0.59 0.63 0.664 0.744 0.802 0.844 0.877 0.904 0.926 0.943 0.96 0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
240 300 600 900 1200 1200 1500 1800 2100 2400 2700 3000 3300 3300 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700	0.63 0.664 0.744 0.802 0.844 0.877 0.904 0.926 0.943 0.96 0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
300 600 900 1200 1500 1800 2100 2400 2700 3000 3300 3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	0.664 0.744 0.802 0.844 0.877 0.904 0.926 0.943 0.96 0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
600 900 1200 1200 1500 1800 2100 2400 2700 3000 3300 3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	0.744 0.802 0.844 0.877 0.904 0.926 0.943 0.96 0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
900 1200 1500 1800 2100 2400 2700 3000 3300 3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	0.802 0.844 0.877 0.904 0.926 0.943 0.96 0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
1200 1500 1800 2100 2400 2700 3000 3300 3300 3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	0.844 0.877 0.904 0.926 0.943 0.96 0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
1500 1800 2100 2400 2400 2700 3000 3300 3300 3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	0.877 0.904 0.926 0.943 0.96 0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
1800 2100 2400 2700 3000 3300 3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 17100 18900 20700 22500	0.904 0.926 0.943 0.96 0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
2100 2400 2700 3000 3300 3300 3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	0.926 0.943 0.96 0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
2400 2700 3000 3300 3300 3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700	0.943 0.96 0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
2700 3000 3300 3300 3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700	0.96 0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
3000 3300 3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	0.971 0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
3300 3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	0.984 0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
3600 3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	0.992 1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)							
3900 4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	1.001 1.008 1.015 1.026 1.035 1.044 1.05	nd surface (m)	•						
4200 4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	1.008 1.015 1.026 1.035 1.044 1.05	nd surface (n							
4500 5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	1.015 1.026 1.035 1.044 1.05	nd surface							
5100 5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	1.026 1.035 1.044 1.05	nd surfac							
5700 6300 6900 7500 8100 9900 11700 13500 15300 17100 18900 20700 22500	1.035 1.044 1.05	nd surf							
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Resu	lts

V _{p75-25} (m ³)	0.08
$a_{p50} (m^2)$	2.20
t _{p75} (s)	250.00
t _{p25} (s)	12550.00
t _{p75-25} (s)	12300.00
Infiltration Rate (m/s)	2.97E-06

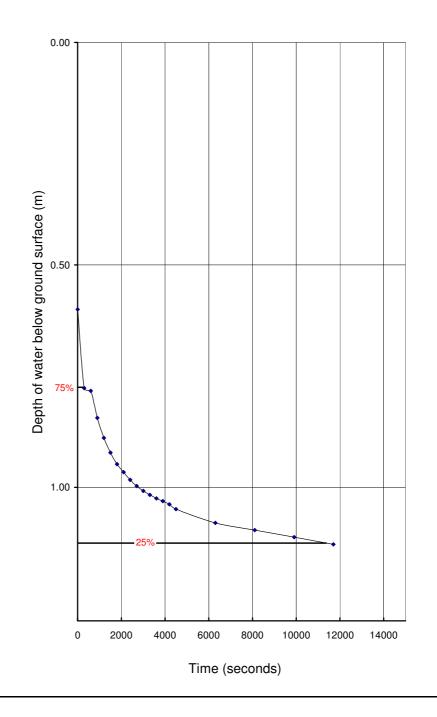
Calculations based on 30% pososity of backfill shingle

Time (seconds)

Location	TP8 (i)	Test No	Test 2
Client	BDW Trading Limited	Length of Trial Pit (m)	1.4
Job Number	25459	Width of Trial Pit (m)	0.45
Date	04.09.12	Water level at start (mbgl)	0.6
Operator	MOS / OP	Depth to Base of Trial Pit (m)	1.30

Time (Secs)	Water level (mbgl)
0	0.60
300	0.78
600	0.78
900	0.84
1200	0.89
1500	0.922
1800	0.948
2100	0.966
2400	0.983
2700	0.997
3000	1.008
3300	1.017
3600	1.025
3900	1.031
4200	1.038
4500	1.049
6300	1.08
8100	1.096
9900	1.112
11700	1.128

Trial Pit Soakaway Test Results



Results

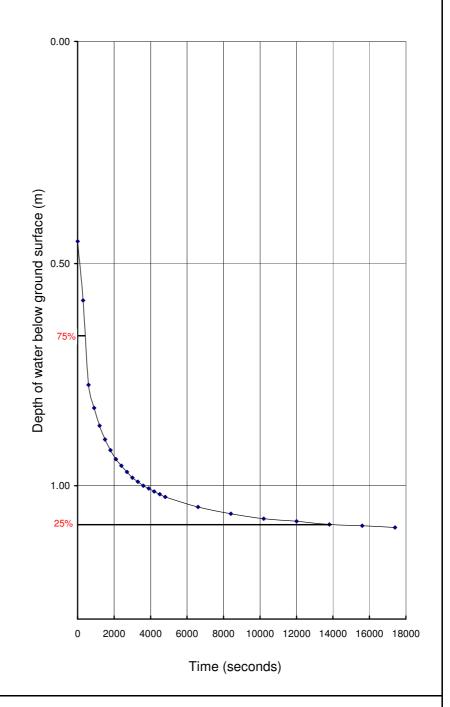
V _{p75-25} (m ³)	0.07
$a_{p50} (m^2)$	1.93
t _{p75} (s)	250.00
t _{p25} (s)	11375.00
t _{p75-25} (s)	11125.00
Infiltration Rate (m/s)	3.09E-06

Calculations based on 30% pososity of backfill shingle Red text denotes inferred data

Location	TP8 (i)	Test No	Test 3
Client	BDW Trading Limited	Length of Trial Pit (m)	1.4
Job Number	25459	Width of Trial Pit (m)	0.45
Date	04.09.12 - 05.09.12	Water level at start (mbgl)	0.45
Operator	MOS / OP	Depth to Base of Trial Pit (m)	1.30

Time (Secs)	Water level (mbgl)
0	0.45
300	0.58
600	0.77
900	0.83
1200	0.87
1500	0.896
1800	0.92
2100	0.94
2400	0.955
2700	0.969
3000	0.982
3300	0.991
3600	1
3900	1.006
4200	1.013
4500	1.019
4800	1.025
6600	1.048
8400	1.063
10200	1.074
12000	1.08
13800	1.087
15600	1.09
17400	1.094

Trial Pit Soakaway Test Results



Results

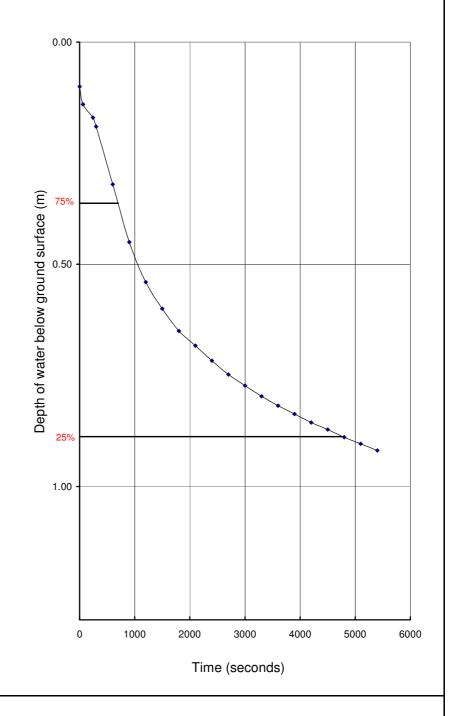
V _{p75-25} (m ³)	0.08
a_{p50} (m ²)	2.20
t _{p75} (s)	400.00
t _{p25} (s)	13900.00
t _{p75-25} (s)	13500.00
Infiltration Rate (m/s)	2.70E-06

Calculations based on 30% pososity of backfill shingle

Location	TP9 (i)	Test No	Test 1
Client	BDW Trading Limited	Length of Trial Pit (m)	1.35
Job Number	25459	Width of Trial Pit (m)	0.45
Date	04.09.12	Water level at start (mbgl)	0.1
Operator	MOS / OP	Depth to Base of Trial Pit (m)	1.15

Time (Secs)	Water level (mbgl)
0	0.10
60	0.14
240	0.17
300	0.19
600	0.32
900	0.45
1200	0.54
1500	0.6
1800	0.65
2100	0.683
2400	0.717
2700	0.748
3000	0.773
3300	0.797
3600	0.818
3900	0.837
4200	0.856
4500	0.872
4800	0.889
5100	0.904
5400	0.919

Trial Pit Soakaway Test Results



Results

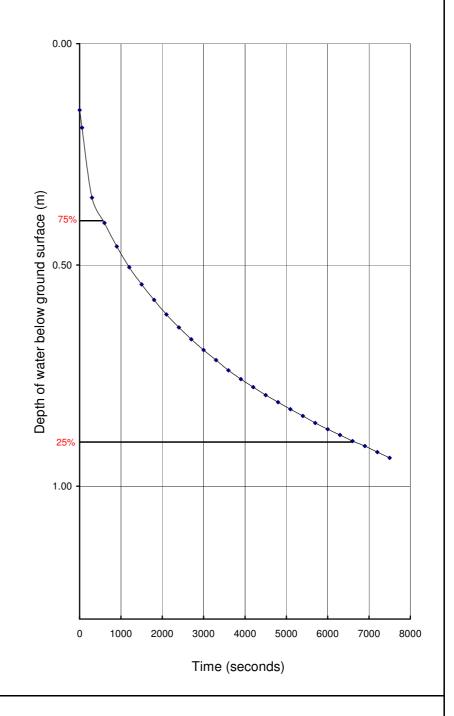
$V_{p75-25} (m^3)$	0.10
a _{p50} (m ²)	2.50
t _{p75} (s)	700.00
t _{p25} (s)	4750.00
t _{p75-25} (s)	4050.00
Infiltration Rate (m/s)	9.46E-06

Calculations based on 30% pososity of backfill shingle

Location	TP9 (i)	Test No	Test 2
Client	BDW Trading Limited	Length of Trial Pit (m)	1.35
Job Number	25459	Width of Trial Pit (m)	0.45
Date	04.09.12	Water level at start (mbgl)	0.15
Operator	MOS / OP	Depth to Base of Trial Pit (m)	1.15

Time (Secs)	Water level (mbgl)
0	0.15
60	0.19
300	0.35
600	0.41
900	0.46
1200	0.505
1500	0.544
1800	0.579
2100	0.612
2400	0.641
2700	0.668
3000	0.692
3300	0.715
3600	0.738
3900	0.758
4200	0.776
4500	0.794
4800	0.81
5100	0.826
5400	0.841
5700	0.857
6000	0.871
6300	0.884
6600	0.898
6900	0.909
7200	0.92
7500	0.94
·	

Trial Pit Soakaway Test Results



Results

V _{p75-25} (m ³)	0.09
a _{p50} (m ²)	2.41
t _{p75} (s)	550.00
t _{p25} (s)	6575.00
t _{p75-25} (s)	6025.00
Infiltration Rate (m/s)	6.28E-06

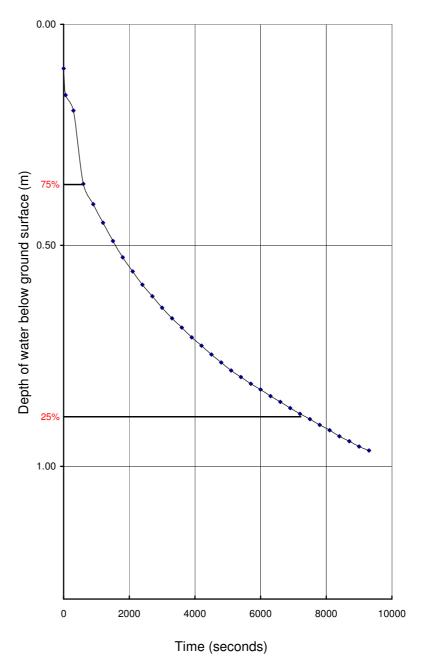
Calculations based on 30% pososity of backfill shingle

Trial Pit Soakaway Test to BRE Digest 365 Location | TP9 (i) | Test No

Location	TP9 (i)	Test No	Test 3
Client	BDW Trading Limited	Length of Trial Pit (m)	1.35
Job Number	25459	Width of Trial Pit (m)	0.45
Date	04.09.12 - 05.09.12	Water level at start (mbgl)	0.1
Operator	MOS / OP / BC	Depth to Base of Trial Pit (m)	1.15

0 0.10 60 0.16 300 0.20 600 0.36 900 0.41 1200 0.49 1500 0.49 1800 0.527 2100 0.589 2400 0.589 2700 0.615 3000 0.641 3300 0.665 3600 3686 3900 0.708 4200 0.727 4500 0.765 5100 0.783 5400 0.798 5700 0.813 6000 0.826 6300 0.841 6600 0.854 6900 0.888 7200 0.89 7800 0.91 8100 0.92 8400 0.932 8700 0.943 9000 0.955 9300 0.964	ime (Secs)	Water level (mbgl)
300 0.20 600 0.36 900 0.41 1200 0.449 1500 0.527 2100 0.559 2400 0.589 2700 0.615 3000 0.665 3600 0.686 3600 0.727 4500 0.727 4500 0.747 4800 0.765 5100 0.783 5400 0.788 5700 0.816 6300 0.826 6300 0.826 6300 0.884 6600 0.854 6900 0.858 7500 0.888 7500 0.889 7800 0.91 8100 0.92 8400 0.922 8700 0.943 9000 0.943	0	0.10
600 0.36 900 0.41 1200 0.449 1500 0.49 1800 0.527 2100 0.559 2400 0.589 2700 0.615 3000 0.641 3300 0.665 3600 0.686 3900 0.708 4200 0.727 4500 0.747 4800 0.765 5100 0.783 5400 0.788 5700 0.813 6000 0.826 6300 0.826 6300 0.826 6300 0.884 6600 0.854 6900 0.868 7200 0.889 7500 0.89 7800 0.91 8100 0.92 8400 0.922 8400 0.932 8700 0.943	60	0.16
900 0.41 1200 0.449 1500 0.49 1800 0.527 2100 0.559 2400 0.615 3000 0.641 3300 0.665 3600 0.686 3900 0.708 4200 0.727 4500 0.747 4800 0.765 5100 0.783 5400 0.798 5700 0.813 6000 0.826 6300 0.826 6300 0.826 6300 0.826 7500 0.834 6900 0.854 6900 0.868 7200 0.889 7500 0.89 7800 0.91 8100 0.92 8400 0.922 8700 0.943		0.20
1200 0.449 1500 0.49 1800 0.527 2100 0.559 2400 0.589 2700 0.615 3000 0.641 3300 0.665 3600 0.686 3900 0.708 4200 0.727 4500 0.765 5100 0.783 5400 0.798 5700 0.813 6000 0.826 6300 0.841 6600 0.854 6900 0.868 7200 0.88 7500 0.89 7800 0.91 8400 0.922 8700 0.943 9000 0.955	600	0.36
1500 0.49 1800 0.527 2100 0.559 2400 0.589 2700 0.615 3000 0.641 3300 0.665 3600 0.686 3900 0.708 4200 0.727 4500 0.747 4800 0.765 5100 0.783 5400 0.798 5700 0.813 6000 0.826 6300 0.841 6600 0.854 6900 0.888 7200 0.88 7500 0.89 7800 0.91 8100 0.92 8400 0.932 8700 0.943 9000 0.955	900	0.41
1800 0.527 2100 0.559 2400 0.589 2700 0.615 3000 0.641 3300 0.665 3600 0.686 3900 0.708 4200 0.727 4500 0.747 4800 0.765 5100 0.783 5400 0.798 5700 0.813 6000 0.826 6300 0.841 6600 0.854 6900 0.868 7200 0.88 7500 0.91 8100 0.92 8400 0.932 8700 0.943 9000 0.955	1200	0.449
2100 0.559 2400 0.589 2700 0.615 3000 0.641 3300 0.665 3600 0.686 3900 0.708 4200 0.727 4500 0.747 4800 0.765 5100 0.783 5400 0.798 5700 0.813 6600 0.826 6300 0.841 6600 0.854 6900 0.868 7200 0.88 7500 0.91 8400 0.92 8400 0.932 8700 0.943 9000 0.955	1500	0.49
2400 0.589 2700 0.615 3000 0.641 3300 0.665 3600 0.686 3900 0.708 4200 0.727 4500 0.747 4800 0.765 5100 0.783 5400 0.798 5700 0.813 6000 0.826 6300 0.841 6600 0.854 6900 0.868 7200 0.88 7500 0.91 8100 0.92 8400 0.932 8700 0.943 9000 0.955	1800	0.527
2700 0.615 3000 0.641 3300 0.665 3600 0.686 3900 0.708 4200 0.727 4500 0.747 4800 0.765 5100 0.783 5400 0.798 5700 0.813 6000 0.826 6300 0.841 6600 0.854 6900 0.868 7200 0.88 7500 0.89 7800 0.91 8400 0.922 8700 0.943 9000 0.955	2100	0.559
3000 0.641 3300 0.665 3600 0.686 3900 0.708 4200 0.727 4500 0.747 4800 0.765 5100 0.783 5400 0.798 5700 0.813 6000 0.826 6300 0.841 6600 0.854 6900 0.868 7200 0.88 7500 0.89 7800 0.91 8100 0.92 8400 0.932 8700 0.943 9000 0.955	2400	0.589
3000 0.641 3300 0.665 3600 0.686 3900 0.708 4200 0.727 4500 0.747 4800 0.765 5100 0.783 5400 0.798 5700 0.813 6000 0.826 6300 0.841 6600 0.854 6900 0.868 7200 0.88 7500 0.89 7800 0.91 8100 0.92 8400 0.932 8700 0.943 9000 0.955	2700	0.615
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8400 0.932 8700 0.943 9000 0.955		
8700 0.943 9000 0.955		
9000 0.955		
9300 0.964		
	9300	0.964
	-	

Trial Pit Soakaway Test Results



Results

$V_{p75-25} (m^3)$	0.10
$a_{p50} (m^2)$	2.50
t _{p75} (s)	550.00
t _{p25} (s)	7225.00
t _{p75-25} (s)	6675.00
Infiltration Rate (m/s)	5.74E-06

Calculations based on 30% pososity of backfill shingle



APPENDIX I GROUND GAS / GROUNDWATER MONITORING DATA

[Pressures]	<u>Previous</u>	<u>During</u>	<u>Start</u>	<u>End</u>	Equipment Used & Remarks
Round 1 Round 2 Round 3	Constant Rising Falling	Constant Rising Falling	1018 1008 1005	1020 1009 1005	Dipmeter + GA2000 + Weather: Clear & Sunny + Ground: Dry + Wind: Strong + Air Temp: 16DegC Dipmeter + GA2000 + Weather: Overcast + Ground: Damp + Wind: Medium + Air Temp: 7DegC Dipmeter + GFM-40 + Weather: Overcast & Sunny + Ground: Dry + Wind: Medium

Exploratory Position ID	Monitoring Round	Measured Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
BH1	1	4.18	19/09/2012	1018	1018	0.0 _(SS)	DRY	0.6	0.1	19.8	-	0.2	0.0	0.0	
BH1	1		15 secs	-	-	0.0 _(SS)	-	0.8	0.1	19.1	-	0.2	0.0	0.0	
BH1	1		30 secs	-	-	0.0 _(SS)	-	0.6	0.1	19.1	-	0.2	0.0	0.0	
BH1	1		60 secs	-	-	0.0 _(SS)	-	0.6	0.1	19.1	-	0.0	0.0	0.0	
BH1	1		90 secs	-	-	0.0 _(SS)	-	0.6	0.1	19.4	-	0.0	0.0	0.0	
BH1	1		120 secs	-	-	0.0 _(SS)	-	0.6	0.1	19.4	-	0.0	0.0	0.0	
BH1	1		180 secs	-	-	0.0 _(SS)	-	0.6	0.1	19.4	-	0.0	0.0	0.0	
BH1	1		240 secs	-	-	0.0 _(SS)	-	0.6	0.1	19.4	-	0.0	0.0	0.0	
BH1	1		300 secs	-	-	0.0 _(SS)	-	0.6	0.1	19.4	-	0.0	0.0	0.0	
BH1	1		360 secs	-	-	0.0 _(SS)	-	0.6	0.1	19.4	-	0.0	0.0	0.0	
BH1	1		420 secs	-	-	0.0 _(SS)	-	0.6	0.1	19.4	-	0.0	0.0	0.0	
BH1	2 (2)	4.22	05/10/2012	1004	1008	0.0 _(SS)	DRY	0.0	0.0	20.4	-	0.0	0.0	0.0	
BH1	2 (2)		15 secs	-	-	0.0 _(SS)	-	1.1	0.0	18.5	-	0.0	0.0	0.0	
BH1	2 (2)		30 secs	-	-	0.0 _(SS)	-	1.1	0.0	18.5	-	0.0	0.0	0.0	
BH1	2 (2)		60 secs	-	-	0.0 _(SS)	-	1.1	0.0	18.5	-	0.0	0.0	0.0	
BH1	2 (2)		90 secs	-	-	0.0 _(SS)	-	1.1	0.0	18.5	-	0.0	0.0	0.0	
BH1	2 (2)		120 secs	-	-	0.0 _(SS)	-	1.1	0.0	18.5	-	0.0	0.0	0.0	
BH1	2 (2)		180 secs	-	-	0.0 _(SS)	-	1.1	0.0	18.5	-	0.0	0.0	0.0	

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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Hertfordshire	
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	24/10/12		
Contract:	NIAB - I	Phase 1	

25459

Contract Ref:

Page:

1 of 11



Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
BH1	2 (2)		240 secs	-	-	0.0 _(SS)	-	1.1	0.0	18.5	-	0.0	0.0	0.0	
BH1	2 (2)		300 secs	-	-	0.0 _(SS)	-	1.1	0.0	18.5	-	0.0	0.0	0.0	
BH1	2 (2)		360 secs	-	-	0.0 _(SS)	-	1.1	0.0	18.5	-	0.0	0.0	0.0	
BH1	2 (2)		420 secs	-	-	0.0 _(SS)	-	1.1	0.0	18.5	-	0.0	0.0	0.0	
BH1	3 (3)	4.25	11/10/2012	1004	1000	0.0 _(SS)	DRY	0.0	0.0	20.9	0.0	-	-	-	
BH1	3 (3)		15 secs	-	-	0.0 _(SS)	-	1.7	0.0	19.9	0.0	-	-	-	
BH1	3 (3)		30 secs	-	-	0.0 _(SS)	-	1.7	0.0	19.2	0.0	-	-	-	
BH1	3 (3)		60 secs	-	-	0.0 _(SS)	-	1.7	0.0	19.1	0.0	-	-	-	
BH1	3 (3)		90 secs	-	-	0.0 _(SS)	-	1.8	0.0	19.0	0.0	-	-	-	
BH1	3 (3)		120 secs	-	-	0.0 _(SS)	-	1.8	0.0	19.0	0.0	-	-	-	
BH1	3 (3)		180 secs	-	-	0.0 _(SS)	-	1.7	0.0	19.1	0.0	-	-	-	
BH2	1		19/09/2012	1018	1018	0.3 _(SS)	-	0.8	0.0(1)	20.1	0.0(1)	0.3	0.0	0.0	
BH2	1		15 secs	1018	1018	0.3 _(SS)	-	0.8	0.0	20.0	0.0	0.2	0.0	0.0	
BH2	1		30 secs	1018	1018	0.3 _(SS)	-	0.8	0.0	20.0	0.0	0.0	0.0	0.0	
BH2	1		60 secs	1018	1018	0.3 _(SS)	-	0.8	0.0	20.0	0.0	0.0	0.0	0.0	
BH2	1		90 secs	1018	1018	0.3 _(SS)	-	0.8	0.0	20.0	0.0	0.0	0.0	0.0	
BH2	1		120 secs	1018	1018	0.3 _(SS)	-	0.8	0.0	20.0	0.0	0.0	0.0	0.0	
BH2	1		180 secs	1018	1018	0.3 _(SS)	-	0.8	0.0	20.0	0.0	0.0	0.0	0.0	
BH2	1		240 secs	1018	1018	0.3 _(SS)	-	0.8	0.0	20.0	0.0	0.0	0.0	0.0	
BH2	1		300 secs	1018	1018	0.3 _(SS)	-	0.8	0.0	20.0	0.0	0.0	0.0	0.0	
BH2	1		360 secs	1018	1018	0.3 _(SS)	-	0.8	0.0	20.0	0.0	0.0	0.0	0.0	
BH2	1		420 secs	1018	1018	0.3 _(SS)	-	0.8	0.0	20.0	0.0	0.0	0.0	0.0	
BH2	2		05/10/2012	1008	1008	0.4(1)	-	0.0	0.0	20.8	0.0	0.0	0.0	0.0	
BH2	2		15 secs	1018	1018	0.0 _(SS)	-	0.5	0.0	19.9	0.0	-	-	-	

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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Hemel Hempstead
Hertfordshire
HP3 9RT

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NIAB - Phase 1

2 of **11**



Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
BH2	2		30 secs	1018	1018	0.0 _(SS)	-	0.5	0.0	19.9	0.0	-	-	-	
BH2	2		60 secs	1018	1018	0.0 _(SS)	-	0.5	0.0	19.9	0.0	-	-	-	
BH2	2		90 secs	1018	1018	0.0 _(SS)	-	0.5	0.0	19.8	0.0	-	-	-	
BH2	2		120 secs	1018	1018	0.0 _(SS)	-	0.5	0.0	19.9	0.0	-	-	-	
BH2	2		180 secs	1018	1018	0.0 _(SS)	-	0.5	0.0	19.9	0.0	-	-	-	
BH2	2		240 secs	1018	1018	0.0 _(SS)	-	0.5	0.0	19.9	0.0	-	-	-	
BH2	2		300 secs	1018	1018	0.0 _(SS)	-	0.5	0.0	19.9	0.0	-	-	-	
BH2	2		360 secs	1018	1018	0.0 _(SS)	-	0.5	0.0	19.9	0.0	-	-	-	
BH2	2		420 secs	1018	1018	0.0 _(SS)	-	0.5	0.0	19.9	0.0	-	-	-	
BH2	3		11/10/2012	1005	1005	0.0(1)	-	0.3	0.0	20.9	0.0	-	-	-	
BH2	3		15 secs	1005	1005	0.0 _(SS)	-	1.7 _(SS)	0.0 _(SS)	20.9 _(SS)	0.0 _(SS)	-	-	-	
BH2	3		30 secs	1005	1005	0.0 _(SS)	-	1.8	0.0	20.0	0.0	-	-	-	
BH2	3		60 secs	1005	1005	0.0 _(SS)	-	1.8	0.0	19.5	0.0	-	-	-	
BH2	3		90 secs	1005	1005	0.0 _(SS)	-	1.8	-	19.4	-	-	-	-	
BH2	3		120 secs	1005	1005	0.0 _(SS)	-	1.8	-	19.3	-	-	-	-	
BH2	3		180 secs	1005	1005	0.0 _(SS)	-	1.7	-	19.3	-	-	-	-	
BH2	3		240 secs	1005	1005	0.0 _(SS)	-	1.7	-	19.4	-	-	-	-	
BH2	3		300 secs	1005	1005	0.0 _(SS)	-	1.7	-	19.4	-	-	-	-	
BH2	3		360 secs	1005	1005	0.0 _(SS)	-	1.7	-	19.4	-	-	-	-	
BH2	3		420 secs	1005	1005	0.0 _(SS)	-	1.7	-	19.4	-	-	-	-	
ВН3	2 (2)	3.23	05/10/2012	-	1009	0.0 _(SS)	1.44	0.0	0.0	20.6	0.0	0.0	0.0	0.0	
BH3	2 (2)		15 secs	-	-	0.0 _(SS)	-	0.7	0.0	19.4	0.0	-	0.0	0.0	
BH3	2 (2)		30 secs	-	-	0.0 _(SS)	-	0.7	0.0	19.4	0.0	-	0.0	0.0	
BH3	2 (2)		60 secs	-	-	0.0 _(SS)	-	0.7	0.0	19.4	0.0	-	0.0	0.0	

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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Hertfordshire
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	24/10/12			25459
Contract:				Page:

NIAB - Phase 1

3 of **11**

Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
BH3	2 (2)		90 secs	-	-	0.0 _(SS)	-	0.7	0.0	19.4	0.0	-	0.0	0.0	
BH3	2 (2)		120 secs	-	-	0.0 _(SS)	-	0.7	0.0	19.3	0.0	-	0.0	0.0	
BH3	2 (2)		180 secs	-	-	0.0 _(SS)	-	0.7	0.0	19.4	0.0	-	0.0	0.0	
ВН3	2 (2)		240 secs	-	-	0.0 _(SS)	-	0.7	0.0	19.3	0.0	-	0.0	0.0	
BH3	2 (2)		300 secs	-	-	0.0 _(SS)	-	0.7	0.0	19.3	0.0	-	0.0	0.0	
ВН3	2 (2)		360 secs	-	-	0.0 _(SS)	-	0.7	0.0	19.3	0.0	-	0.0	0.0	
BH3	2 (2)		420 secs	-	-	0.0 _(SS)	-	0.7	0.0	19.3	0.0	-	0.0	0.0	
ВН3	3 (3)	3.50	11/10/2012	-	1008	0.0 _(SS)	1.58	0.0	-	20.7	-	-	0.0	-	
ВН3	3 (3)		15 secs	-	-	0.0 _(SS)	-	1.4	-	19.4	-	-	-	-	
ВН3	3 (3)		30 secs	-	-	0.0 _(SS)	-	1.5	-	18.2	-	-	-	-	
BH3	3 (3)		60 secs	-	-	0.0 _(SS)	-	1.5	-	17.9	-	-	-	-	
BH3	3 (3)		90 secs	-	-	0.0 _(SS)	-	1.5	-	17.9	-	-	-	-	
BH3	3 (3)		120 secs	-	-	0.0 _(SS)	-	1.5	-	17.9	-	-	-	-	
BH3	3 (3)		180 secs	-	-	0.0 _(SS)	-	1.5	-	17.9	-	-	-	-	
BHG	1	4.32	19/09/2012	1018	1018	-0.1 _(SS)	2.12	0.2	0.0	20.2	0.0	0.3	0.0	0.0	
BHG	1		15 secs	-	-	-0.1 _(SS)	-	0.2	0.0	20.2	0.0	0.0	0.0	0.0	
BHG	1		30 secs	-	-	-0.1 _(SS)	-	0.2	0.0	20.2	0.0	0.0	0.0	0.0	
BHG	1		60 secs	-	-	-0.1 _(SS)	-	0.2	0.0	20.3	0.0	0.0	0.0	0.0	
BHG	1		90 secs	-	-	-0.1 _(SS)	-	0.2	0.0	20.3	0.0	0.0	0.0	0.0	
BHG	1		120 secs	-	-	-0.1 _(SS)	-	0.2	0.0	20.3	0.0	0.0	0.0	0.0	
BHG	1		180 secs	-	-	-0.1 _(SS)	-	0.1	0.0	20.3	0.0	0.0	0.0	0.0	
BHG	1		240 secs	-	-	-0.1 _(SS)	-	0.2	0.0	20.3	0.0	0.0	0.0	0.0	
BHG	1		300 secs	-	-	-0.1 _(SS)	-	0.2	0.0	20.2	0.0	0.0	0.0	0.0	
BHG	1		360 secs	-	-	-0.1 _(SS)	-	0.2	0.0	20.2	0.0	0.0	0.0	0.0	

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

RSK Environment Ltd 18 Frogmore Road Hemel Hempstead Hertfordshire HP3 9RT

Compiled By	Date	Checked By	Date	Contract Ref:
	24/10/12			
Contract:				Page:

NIAB - Phase 1

4 of **11**



Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
BHG	1		420 secs	-	-	-0.1 _(SS)	-	0.2	0.0	20.2	0.0	0.0	0.0	0.0	
BHG	2 (2)	4.31	05/10/2012	1008	1008	0.0 _(SS)	2.15	0.0	0.0	20.8	0.0	0.0	0.0	0.0	
BHG	2 (2)		15 secs	-	-	0.0 _(SS)	-	0.3	0.0	19.6	0.0	0.0	0.0	0.0	
BHG	2 (2)		30 secs	-	-	0.0 _(SS)	-	0.3	0.0	19.9	0.0	0.0	0.0	0.0	
BHG	2 (2)		60 secs	-	-	0.0 _(SS)	-	0.3	0.0	20.0	0.0	0.0	0.0	0.0	
BHG	2 (2)		90 secs	-	-	0.0 _(SS)	-	0.3	0.0	20.0	0.0	0.0	0.0	0.0	
BHG	2 (2)		120 secs	-	-	0.0 _(SS)	-	0.2	0.0	20.0	0.0	0.0	0.0	0.0	
BHG	2 (2)		180 secs	-	-	0.0 _(SS)	-	0.2	0.0	20.1	0.0	0.0	0.0	0.0	
BHG	2 (2)		240 secs	-	-	0.0 _(SS)	-	0.2	0.0	20.1	0.0	0.0	0.0	0.0	
BHG	2 (2)		300 secs	-	-	0.0 _(SS)	-	0.1	0.0	20.1	0.0	0.0	0.0	0.0	
BHG	2 (2)		360 secs	-	-	0.0 _(SS)	-	0.1	0.0	20.1	0.0	0.0	0.0	0.0	
BHG	2 (2)		420 secs	-	-	0.0 _(SS)	-	0.1	0.0	20.2	0.0	0.0	0.0	0.0	
BHG	3 (3)	4.58	11/10/2012	1003	1003	0.0 _(SS)	2.40	0.3	0.0	20.9	0.0	-	-	-	
BHG	3 (3)		15 secs	-	-	0.0 _(SS)	-	1.7	0.0	20.0	0.0	-	-	-	
BHG	3 (3)		30 secs	-	-	0.0 _(SS)	-	1.8	0.0	19.5	0.0	-	-	-	
BHG	3 (3)		60 secs	-	-	0.0 _(SS)	-	1.8	0.0	19.4	0.0	-	-	-	
BHG	3 (3)		90 secs	-	-	0.0 _(SS)	-	1.8	0.0	19.3	0.0	-	-	-	
BHG	3 (3)		120 secs	-	-	0.0 _(SS)	-	1.8	0.0	19.3	0.0	-	-	-	
BHG	3 (3)		180 secs	-	-	0.0 _(SS)	-	1.7	0.0	19.4	0.0	-	-	-	
BHG	3 (3)		240 secs	-	-	0.0 _(SS)	-	1.7	0.0	19.4	0.0	-	-	-	
BHG	3 (3)		300 secs	-	-	0.0 _(SS)	-	1.7	0.0	19.4	0.0	-	-	-	
BHG	3 (3)		360 secs	-	-	0.0 _(SS)	-	1.7	0.0	19.4	0.0	-	-	-	
BHG	3 (3)		420 secs	-	-	0.0 _(SS)	-	1.7	0.0	19.4	0.0	-	-	-	
BHK	1	4.05	19/09/2012	1018	1018	0.0 _(SS)	1.97	1.3	0.1	19.8	1.0	0.0	0.0	0.0	

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18 Frogmore Road
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HP3 9RT

Compiled By	Date	Checked By	Date	Contract Ref:
* *	24/10/12			
Contract:		<u> </u>		Page:

NIAB - Phase 1

of **11**



Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
BHK	1		15 secs	-	-	0.0 _(SS)	-	1.3	0.1	19.5	1.0	0.0	0.0	0.0	
BHK	1		30 secs	-	-	0.0 _(SS)	-	1.4	0.1	19.5	1.0	0.0	0.0	0.0	
BHK	1		60 secs	-	-	0.0 _(SS)	-	1.3	0.1	19.5	1.0	0.0	0.0	0.0	
BHK	1		90 secs	-	-	0.0 _(SS)	-	1.3	0.1	19.5	1.0	0.0	0.0	0.0	
BHK	1		120 secs	-	-	0.0 _(SS)	-	1.4	0.1	19.5	1.0	0.0	0.0	0.0	
BHK	1		180 secs	-	-	0.0 _(SS)	-	1.5	0.1	19.5	1.0	0.0	0.0	0.0	
BHK	1		240 secs	-	-	0.0 _(SS)	-	1.7	0.1	19.4	1.0	0.0	0.0	0.0	
BHK	1		300 secs	-	-	0.0 _(SS)	-	1.8	0.1	19.3	1.0	0.0	0.0	0.0	
BHK	1		360 secs	-	-	0.0 _(SS)	-	1.8	0.1	19.3	1.0	0.0	0.0	0.0	
BHK	1		420 secs	-	-	0.0 _(SS)	-	1.8	0.1	19.3	1.0	0.0	0.0	0.0	
BHK	2 (2)	4.04	05/10/2012	1009	1008	0.2 _(SS)	2.06	0.2	0.0	20.8	-	0.0	0.0	0.0	
BHK	2 (2)		15 secs	-	-	0.2 _(SS)	-	0.7	0.0	19.8	-	0.0	0.0	0.0	
BHK	2 (2)		30 secs	-	-	0.2 _(SS)	-	1.3	0.0	19.1	-	0.0	0.0	0.0	
BHK	2 (2)		60 secs	-	-	0.2 _(SS)	-	1.3	0.0	19.1	-	0.0	0.0	0.0	
BHK	2 (2)		90 secs	-	-	0.2 _(SS)	-	1.3	0.0	19.1	-	0.0	0.0	0.0	
BHK	2 (2)		120 secs	-	-	0.2 _(SS)	-	1.2	0.0	19.1	-	0.0	0.0	0.0	
BHK	2 (2)		180 secs	-	-	0.2 _(SS)	-	1.3	0.0	19.1	-	0.0	0.0	0.0	
BHK	2 (2)		240 secs	-	-	0.2 _(SS)	-	1.2	0.0	19.1	-	0.0	0.0	0.0	
BHK	2 (2)		300 secs	-	-	0.2 _(SS)	-	1.2	0.0	19.1	-	0.0	0.0	0.0	
BHK	2 (2)		360 secs	-	-	0.2 _(SS)	-	1.2	0.0	19.1	-	0.0	0.0	0.0	
BHK	2 (2)		420 secs	-	-	0.2 _(SS)	-	1.2	0.0	19.1	-	0.0	0.0	0.0	
BHK	3 (3)	4.30	11/10/2012	-	1006	-0.1 _(SS)	2.38	0.1	0.0	20.7	0.0	-	-	-	
BHK	3 (3)		15 secs	-	-	-0.1 _(SS)	-	3.2	0.0	19.2	0.0	-	-	-	
BHK	3 (3)		30 secs	-	-	-0.1 _(SS)	-	3.3	0.0	18.4	0.0	-	-	-	
BHK	3 (3)		60 secs	-	-	-0.1 _(SS)	-	3.3	0.0	18.2	0.0	-	-	-	

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RSK Environment Ltd 18 Frogmore Road Hemel Hempstead Hertfordshire HP3 9RT

Compiled By	Date	Checked By	Date	Contract F
	24/10/12			
Contract:				Page:

NIAB - Phase 1

6 of **11**



Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
BHK	3 (3)		90 secs	-	-	-0.1 _(SS)	-	3.4	0.0	18.1	0.0	-	-	-
BHK	3 (3)		120 secs	-	-	-0.1 _(SS)	-	3.4	0.0	18.1	0.0	-	-	-
BHK	3 (3)		180 secs	-	-	-0.1 _(SS)	-	3.5	0.0	18.0	0.0	-	-	-
BHK	3 (3)		240 secs	-	-	-0.1 _(SS)	-	3.5	0.0	18.0	0.0	-	-	-
BHK	3 (3)		300 secs	-	-	-0.1 _(SS)	-	3.5	0.0	18.0	0.0	-	-	-
WS3	1	3.21	19/09/2012	1018	1018	0.2 _(SS)	DRY	0.0	0.1	20.3	0.0	0.0	0.0	0.0
WS3	1		15 secs	-	-	0.2 _(SS)	-	0.6	0.1	20.2	1.0	0.0	0.0	0.0
WS3	1		30 secs	-	-	0.2 _(SS)	-	0.7	0.1	20.2	1.0	0.0	0.0	0.0
WS3	1		60 secs	-	-	0.2 _(SS)	-	0.8	0.1	20.2	1.0	0.0	0.0	0.0
WS3	1		90 secs	-	-	0.2 _(SS)	-	0.7	0.1	20.2	1.0	0.0	0.0	0.0
WS3	1		120 secs	-	-	0.2 _(SS)	-	0.7	0.1	20.2	1.0	0.0	0.0	0.0
WS3	1		180 secs	-	-	0.2 _(SS)	-	0.6	0.1	20.3	1.0	0.0	0.0	0.0
WS3	1		240 secs	-	-	0.2 _(SS)	-	0.6	0.1	20.3	1.0	0.0	0.0	0.0
WS3	1		300 secs	-	-	0.2 _(SS)	-	0.5	0.1	20.4	1.0	0.0	0.0	0.0
WS3	1		360 secs	-	-	0.2 _(SS)	-	0.4	0.1	20.5	1.0	0.0	0.0	0.0
WS3	1		420 secs	-	-	0.2 _(SS)	-	0.4	0.1	20.5	1.0	0.0	0.0	0.0
WS3	2 (2)	3.18	05/10/2012	1004	1008	0.3 _(SS)	2.92	1.1	0.0	19.6	-	-	-	-
WS3	2 (2)		15 secs	-	-	0.3 _(SS)	-	1.1	0.0	19.6	-	-	-	-
WS3	2 (2)		30 secs	-	-	0.3 _(SS)	-	1.1	0.0	19.5	-	-	-	-
WS3	2 (2)		60 secs	-	-	0.3 _(SS)	-	1.2	0.0	19.5	-	-	-	-
WS3	2 (2)		90 secs	-	-	0.3 _(SS)	-	1.2	0.0	19.5	-	-	-	-
WS3	2 (2)		120 secs	-	-	0.3 _(SS)	-	1.1	0.0	19.4	-	-	-	-
WS3	2 (2)		180 secs	-	-	0.3 _(SS)	-	1.0	0.0	19.5	-	-	-	-
WS3	2 (2)		240 secs	-	-	0.3 _(SS)	1	0.9	0.0	19.5	-	-	-	-

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RSK Environment Ltd 18 Frogmore Road Hemel Hempstead Hertfordshire HP3 9RT

Compiled By	Date	Checked By	Date	Contract Ref:
	24/10/12			
Contract:	•			Page:

NIAB - Phase 1

25459

Page:

7 of **11**



Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)
WS3	2 (2)		300 secs	-	-	0.3 _(SS)	-	0.9	0.0	19.6	-	-	-	-
WS3	2 (2)		360 secs	-	-	0.3 _(SS)	-	0.8	0.0	19.6	-	-	-	-
WS3	2 (2)		420 secs	-	-	0.3 _(SS)	-	0.8	0.0	19.6	-	-	-	-
WS3	3 (3)	5.44	11/10/2012	-	1006	0.0 _(SS)	2.87	0.3	0.0	20.7	0.0	-	-	-
WS3	3 (3)		15 secs	-	-	0.0 _(SS)	-	2.1	0.0	19.9	0.0	-	-	-
WS3	3 (3)		30 secs	-	-	0.0 _(SS)	-	2.2	0.0	19.3	0.0	-	-	-
WS3	3 (3)		60 secs	-	-	0.0 _(SS)	-	2.2	0.0	19.3	0.0	-	-	-
WS3	3 (3)		90 secs	-	-	0.0 _(SS)	-	2.2	0.0	19.3	0.0	-	-	-
WS3	3 (3)		120 secs	-	-	0.0 _(SS)	-	2.2	0.0	19.3	0.0	-	-	-
WS3	3 (3)		180 secs	-	-	0.0 _(SS)	-	2.2	0.0	19.3	0.0	-	-	-
WS3	3 (3)		240 secs	-	-	0.0 _(SS)	-	2.2	0.0	19.3	0.0	-	-	-
WS3	3 (3)		300 secs	-	-	0.0 _(SS)	-	2.2	0.0	19.3	0.0	-	-	-
WS3	3 (3)		360 secs	-	-	0.0 _(SS)	-	2.2	0.0	19.3	0.0	-	-	-
WS3	3 (3)		420 secs	-	-	0.0 _(SS)	-	2.2	0.0	19.3	0.0	-	-	-
WS17	1	2.95	19/09/2012	1020	1020	0.1 _(SS)	DRY	1.7	0.0	19.5	0.0	-	-	-
WS17	1		15 secs	-	-	0.1 _(SS)	-	1.7	0.0	19.5	0.0	-	-	-
WS17	1		30 secs	-	-	0.1 _(SS)	-	1.8	0.0	19.2	0.0	-	-	-
WS17	1		60 secs	-	-	0.1 _(SS)	-	2.0	0.0	19.1	0.0	-	-	-
WS17	1		90 secs	-	-	0.1 _(SS)	-	2.1	0.1	19.0	1.0	-	-	-
WS17	1		120 secs	-	-	0.1 _(SS)	-	2.4	0.1	18.8	2.0	-	-	-
WS17	1		180 secs	-	-	0.1 _(SS)	-	2.7	0.1	18.7	2.0	-	-	-
WS17	1		240 secs	-	-	0.1 _(SS)	-	2.9	0.1	18.6	2.0	-	-	-
WS17	1		300 secs	-	-	0.1 _(SS)	-	2.9	0.1	18.6	2.0	-	-	-
WS17	1		360 secs	-	-	0.1 _(SS)	1	2.9	0.1	18.6	2.0	-	-	-

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RSK Environment Ltd
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	Compiled By	Date	Checked By	Date	Contract Ref:
	_ ,	24/10/12			
(Contract:				Page:

NIAB - Phase 1

3 of **11**



Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
WS17	1		420 secs	-	-	0.1 _(SS)	-	2.9	0.1	18.6	2.0	-	-	-	
WS17	2 (2)	2.95	05/10/2012	1383	1009	0.0 _(SS)	1.88	0.1	0.0	20.2	0.0	0.0	0.0	0.0	
WS17	2 (2)		15 secs	-	-	0.0 _(SS)	-	0.3	0.0	20.2	0.0	-	0.0	0.0	
WS17	2 (2)		30 secs	-	-	0.0 _(SS)	-	0.4	0.0	20.2	0.0	-	0.0	0.0	
WS17	2 (2)		60 secs	-	-	0.0 _(SS)	-	0.8	0.0	19.7	0.0	-	0.0	0.0	
WS17	2 (2)		90 secs	-	-	0.0 _(SS)	-	0.9	0.0	19.6	0.0	-	0.0	0.0	
WS17	2 (2)		120 secs	-	-	0.0 _(SS)	-	1.3	0.0	19.2	0.0	-	0.0	0.0	
WS17	2 (2)		180 secs	-	-	0.0 _(SS)	-	1.4	0.0	18.9	0.0	-	0.0	0.0	
WS17	2 (2)		240 secs	-	-	0.0 _(SS)	-	1.5	0.0	18.8	0.0	-	0.0	0.0	
WS17	2 (2)		300 secs	-	-	0.0 _(SS)	-	1.5	0.0	18.8	0.0	-	0.0	0.0	
WS17	2 (2)		360 secs	-	-	0.0 _(SS)	-	1.4	0.0	18.9	0.0	-	0.0	0.0	
WS17	2 (2)		420 secs	-	-	0.0 _(SS)	-	1.3	0.0	18.9	0.0	-	0.0	0.0	
WS17	3 (3)	2.90	11/10/2012	-	1005	0.0 _(SS)	1.85	0.2	-	21.3	-	-	-	-	
WS17	3 (3)		15 secs	-	-	0.0 _(SS)	-	0.6	-	20.6	-	-	-	-	
WS17	3 (3)		30 secs	-	-	0.0 _(SS)	-	0.6	-	20.5	-	-	-	-	
WS17	3 (3)		60 secs	-	-	0.0 _(SS)	-	0.7	-	20.4	-	-	-	-	
WS17	3 (3)		90 secs	-	-	0.0 _(SS)	-	0.9	-	20.2	-	-	-	-	
WS17	3 (3)		120 secs	-	-	0.0 _(SS)	-	1.1	-	20.0	-	-	-	-	
WS17	3 (3)		180 secs	-	-	0.0 _(SS)	-	1.4	-	19.6	-	-	-	-	
WS17	3 (3)		240 secs	-	-	0.0 _(SS)	-	1.6	-	19.6	-	-	-	-	
WS17	3 (3)		300 secs	-	-	0.0 _(SS)	-	1.7	-	19.3	-	-	-	-	
WS17	3 (3)		360 secs	-	-	0.0 _(SS)	-	1.7	-	19.3	-	-	-	-	
WSH	1	2.33	19/09/2012	1018	1018	0.0	DRY	2.7	0.1	19.1	1.0	0.7	0.0	0.0	
WSH	1	2.33	15 secs	-	-	0.0 _(SS)	-	2.7	0.1	19.1	1.0	0.7	0.0	0.0	

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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Hemel Hempstead
Hertfordshire
HP3 9RT

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	24/10/12			
Contract:				Page.

NIAB - Phase 1

Page:

9 of **11**



Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	Oxygen (% / vol)	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
WSH	1		30 secs	-	-	0.0 _(SS)	-	3.1	0.1	18.8	1.0	0.0	0.0	0.0	
WSH	1		60 secs	-	-	0.0 _(SS)	-	3.4	0.1	18.8	1.0	0.0	0.0	0.0	
WSH	1		90 secs	-	-	0.0 _(SS)	-	3.5	0.1	18.8	1.0	0.0	0.0	0.0	
WSH	1		120 secs	-	-	0.0 _(SS)	-	3.6	0.1	18.7	1.0	0.0	0.0	0.0	
WSH	1		180 secs	-	-	0.0 _(SS)	-	3.6	0.1	18.8	1.0	0.0	0.0	0.0	
WSH	1		240 secs	-	-	0.0 _(SS)	-	3.5	0.1	18.9	1.0	0.0	0.0	0.0	
WSH	1		300 secs	-	-	0.0 _(SS)	-	3.3	0.1	18.9	1.0	0.0	0.0	0.0	
WSH	1		360 secs	-	-	0.0 _(SS)	-	3.3	0.1	19.0	1.0	0.0	0.0	0.0	
WSH	1		420 secs	-	-	0.0 _(SS)	-	3.2	0.1	19.0	1.0	0.0	0.0	0.0	
WSH	2 (2)	2.39	05/10/2012	-	1008	0.0 _(SS)	DRY	0.0	0.0	19.9	-	0.0	0.0	0.0	
WSH	2 (2)		15 secs	-	-	0.0 _(SS)	-	1.3	0.0	19.1	-	-	0.0	0.0	
WSH	2 (2)		30 secs	-	-	0.0 _(SS)	-	2.9	0.0	18.7	-	-	0.0	0.0	
WSH	2 (2)		60 secs	-	-	0.0 _(SS)	-	3.3	0.0	18.4	-	-	0.0	0.0	
WSH	2 (2)		90 secs	-	-	0.0 _(SS)	-	3.4	0.0	18.4	-	-	0.0	0.0	
WSH	2 (2)		120 secs	-	-	0.0 _(SS)	-	3.4	0.0	18.4	-	-	0.0	0.0	
WSH	2 (2)		180 secs	-	-	0.0 _(SS)	-	3.4	0.0	18.4	-	-	0.0	0.0	
WSH	2 (2)		240 secs	-	-	0.0 _(SS)	-	3.3	0.0	18.4	-	-	0.0	0.0	
WSH	2 (2)		300 secs	-	-	0.0 _(SS)	-	3.4	0.0	18.4	-	-	0.0	0.0	
WSH	2 (2)		360 secs	-	-	0.0 _(SS)	-	3.3	0.0	18.4	-	-	0.0	0.0	
WSH	2 (2)		420 secs	-	-	0.0 _(SS)	-	3.3	0.0	18.4	-	-	0.0	0.0	
WSH	3 (3)	2.70	11/10/2012	1004	1005	0.0 _(SS)	DRY	0.1	0.0	20.8	0.0	-	-	-	
WSH	3 (3)		15 secs	-	-	0.0 _(SS)	-	3.5	0.0	19.2	0.0	-	-	-	
WSH	3 (3)		30 secs	-	-	0.0 _(SS)	-	3.5	0.0	18.6	0.0	-	-	-	
WSH	3 (3)		60 secs	-	-	0.0 _(SS)	-	3.7	0.0	18.4	0.0	-	-	-	
WSH	3 (3)		90 secs	-	-	0.0 _(SS)	-	4.0	0.0	18.2	0.0	-	-	-	

Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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NIAB - Phase 1

25459

10 of **11**



IN-SITU GAS MONITORING RESULTS

Exploratory Position ID	Monitoring Round	Installation Depth (mbgl)	Date & Time of Monitoring (elapsed time)	Borehole Pressure (mb)	Atmos Pressure (mb)	Gas Flow (l/hr)	Water Depth (mbgl)	Carbon Dioxide (% / vol)	Methane (% / vol)	,,	LEL (%)	PID (ppm)	Carbon Monoxide (ppm)	Hydrogen Sulphide (ppm)	
WSH	3 (3)		120 secs	-	-	0.0 _(SS)	-	4.1	0.0	18.1	0.0	-	-	-	
WSH	3 (3)		180 secs	-	-	0.0 _(SS)	-	4.2	0.0	18.0	0.0	-	-	-	
WSH	3 (3)		240 secs	-	-	0.0 _(SS)	-	4.2	0.0	18.0	0.0	-	-	-	
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Key: I = Initial, P = Peak, SS = Steady State. Note: LEL = Lower Explosive Limit = 5% v/v.

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Environment Ltd
rogmore Road
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NIAB - Phase 1

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Contract Ref: Date

25459

Page:

11 of **11**





APPENDIX J LABORATORY CERTIFICATES FOR SOIL ANALYSIS



FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 12/03975

Issue Number: Date: 17 September, 2012

Client: **RSK Environment Ltd Hemel**

> 18 Frogmore Road Hemel Hempstead

Hertfordshire

UK

HP3 9RT

Project Manager: Nigel Austin / Ben Coulston

Project Name: NIAB Phase 1

Project Ref: 25459

Order No: Not specified **Date Samples Received:** 03/09/12 **Date Instructions Received:** 04/09/12 **Date Analysis Completed:** 17/09/12

Prepared by: Approved by:

Melanie Marshall Iain Haslock

Analytical Consultant Laboratory Coordinator

Notes - Soil analysis

All results are reported as dry weight (<40 $^{\circ}$ C).

For samples with Matrix Codes 1 - 6 inert stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on dried & crushed sample.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts. Superscript "M" indicates method accredited to MCERTS. Results in italics are associated with a control limit flag.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling.

Predominant Matrix Codes - 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.

Samples with Matrix Code 7 are not predominantly a SAND/LOA mix and are not covered by our MCERTS accreditation.

Secondary Matrix Codes - A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis. NDP indicates No Determination Possible. NAD indicates No Asbestos Detected.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.





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Lab Sample ID	12/03975/1	12/03975/2	12/03975/3	12/03975/4	12/03975/5	12/03975/6	12/03975/7	12/03975/8		
Client Sample No										
Client Sample ID	TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP8		
Depth to Top	0.10	0.20	0.10	0.20	0.10	0.20	0.20	0.10		
Depth To Bottom	0.20	0.30			0.30		0.30	0.20		
Date Sampled	30-Aug-12	30-Aug-12	28-Aug-12	28-Aug-12	30-Aug-12	28-Aug-12	30-Aug-12	30-Aug-12		<u>+</u>
Sample Type	Soil - ES	Soil - ES	Soil - ES	,	Method ref					
Sample Matrix Code	6AE	6AE	6AE	6AE	6E	5	6AE	4E	Units	Meth
Asbestos in soil _A #	NAD	-	NAD	-	-	-	NAD	-		A-T-045
Organic matter _D ^{M#}	-	-	-	-	-	1.0	-	-	% w/w	A-T-032 OM
Arsenic _D ^{M#}	7	6	5	5	8	4	9	9	mg/kg	A-T-024
Cadmium _D ^{M#}	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	mg/kg	A-T-024
Copper _D ^{M#}	32	23	19	23	31	9	16	13	mg/kg	A-T-024
Chromium _D #	43	45	40	47	44	37	31	22	mg/kg	A-T-024
Lead _D ^{M#}	154	51	37	41	92	15	41	23	mg/kg	A-T-024
Mercury _D	0.49	0.38	0.29	0.39	0.52	<0.17	<0.17	<0.17	mg/kg	A-T-024
Nickel _D ^{M#}	37	34	31	35	39	24	28	20	mg/kg	A-T-024
Selenium _D ^{M#}	3	<1	<1	<1	<1	<1	<1	<1	mg/kg	A-T-024
Zinc _D ^{M#}	121	86	57	66	79	55	57	45	mg/kg	A-T-024



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Lab Sample ID	12/03975/1	12/03975/2	12/03975/3	12/03975/4	12/03975/5	12/03975/6	12/03975/7	12/03975/8		
Client Sample No										
Client Sample ID	TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP8		
Depth to Top	0.10	0.20	0.10	0.20	0.10	0.20	0.20	0.10		
Depth To Bottom	0.20	0.30			0.30		0.30	0.20		
Date Sampled	30-Aug-12	30-Aug-12	28-Aug-12	28-Aug-12	30-Aug-12	28-Aug-12	30-Aug-12	30-Aug-12		e
Sample Type	Soil - ES	(0	Method ref							
Sample Matrix Code	6AE	6AE	6AE	6AE	6E	5	6AE	4E	Units	Meth
PAH 16										
Acenaphthylene _A #	-	<0.01	<0.01	-	-	<0.01	-	<0.01	mg/kg	A-T-019s
Anthracene _A #	-	<0.01	<0.01	-	-	<0.01	-	0.04	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	0.06	0.02	-	-	<0.01	-	0.12	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	0.07	0.01	-	-	<0.01	-	0.08	mg/kg	A-T-019s
Benzo(b)fluoranthene _A	-	0.16	0.04	-	-	<0.01	-	0.18	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	0.09	0.01	-	-	<0.01	-	0.09	mg/kg	A-T-019s
Benzo(k)fluoranthene _A	-	0.05	<0.01	-	-	<0.01	-	0.04	mg/kg	A-T-019s
Chrysene _A ^{M#}	-	0.08	0.02	-	-	<0.01	-	0.14	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	-	<0.01	<0.01	-	-	<0.01	-	<0.01	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	-	0.08	<0.01	-	-	<0.01	-	0.29	mg/kg	A-T-019s
Fluorene _A ^{M#}	-	<0.01	<0.01	-	-	<0.01	-	<0.01	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	-	0.06	<0.01	-	-	<0.01	-	0.06	mg/kg	A-T-019s
Naphthalene _A ^{M#}	-	<0.01	<0.01	-	-	<0.01	-	<0.01	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	-	<0.01	<0.01	-	-	<0.01	-	0.17	mg/kg	A-T-019s
Pyrene _A ^{M#}	-	0.07	0.01	-	-	<0.01	-	0.22	mg/kg	A-T-019s
Total PAH _A	-	0.72	0.12	-	-	<0.01	-	1.43	mg/kg	A-T-019s



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Lab Sample ID	12/03975/9	12/03975/10	12/03975/11	12/03975/12	12/03975/13	12/03975/14	12/03975/15	12/03975/16		
Client Sample No										
Client Sample ID	TP10	TP11	TP13	TP14	TP34	TP35	TP36	TP37		
Depth to Top	0.20	0.10	0.20	0.10	0.20	0.10	0.10	0.10		
Depth To Bottom		0.20	0.30	0.20				0.20		
Date Sampled	30-Aug-12	30-Aug-12	30-Aug-12	30-Aug-12	29-Aug-12	29-Aug-12	29-Aug-12	29-Aug-12		ef
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	s	Method ref
Sample Matrix Code	5A	6AE	6AE	4A	6AE	6A	6AE	6AE	Units	Meth
Asbestos in soil _A #	NAD	-	NAD	NAD	-	-	-	NAD		A-T-045
Organic matter _D ^{M#}	2.2	-	-	-	3.2	-	-	-	% w/w	A-T-032 OM
Arsenic _D ^{M#}	10	9	10	9	8	10	9	9	mg/kg	A-T-024
Cadmium _D ^{M#}	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	mg/kg	A-T-024
Copper _D ^{M#}	18	16	14	15	24	33	19	22	mg/kg	A-T-024
Chromium _D #	24	22	18	20	26	29	34	28	mg/kg	A-T-024
Lead _D ^{M#}	34	35	30	46	46	62	33	40	mg/kg	A-T-024
Mercury _D	<0.17	<0.17	<0.17	<0.17	0.56	0.27	<0.17	0.21	mg/kg	A-T-024
Nickel _D ^{M#}	21	21	19	18	19	20	23	18	mg/kg	A-T-024
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	A-T-024
Zinc _D ^{M#}	59	54	45	45	49	62	52	46	mg/kg	A-T-024
Triazine Herbicides (x11)	-	-	-	Appended	-	-	-	Appended		Subcon
Pyrethroid (Pyrethrin) Insecticides (x6)	-	-	-	Appended	-	-	-	Appended		Subcon



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Lab Sample ID	12/03975/9	12/03975/10	12/03975/11	12/03975/12	12/03975/13	12/03975/14	12/03975/15	12/03975/16		
Client Sample No										
Client Sample ID	TP10	TP11	TP13	TP14	TP34	TP35	TP36	TP37		
Depth to Top	0.20	0.10	0.20	0.10	0.20	0.10	0.10	0.10		
Depth To Bottom		0.20	0.30	0.20				0.20		
Date Sampled	30-Aug-12	30-Aug-12	30-Aug-12	30-Aug-12	29-Aug-12	29-Aug-12	29-Aug-12	29-Aug-12		e
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	ø	Method ref
Sample Matrix Code	5 A	6AE	6AE	4A	6AE	6 A	6AE	6AE	Units	Meth
Pest-c										
Mevinphos	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
Dichlorvos	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
alpha-Hexachlorocyclohexane (HCH)	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
Diazinon	-	-	1	<50	-	-	-	<50	μg/kg	Subcon
gamma-Hexachlorocyclohexane (HCH / Lindane)	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
Heptachlor	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
Aldrin	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
beta-Hexachlorocyclohexane (HCH)	-	-	•	<50	-	-	-	<50	μg/kg	Subcon
Methyl Parathion	-	-	•	<50	-	-	-	<50	μg/kg	Subcon
Malathion	-	-	•	<50	-	-	-	<50	μg/kg	Subcon
Fenitrothion	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
Heptachlor Epoxide	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
Parathion	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
p,p-DDE	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
p,p-DDT	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
p,p-Methoxychlor	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
p,p-TDE (DDD)	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
o,p-DDE	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
o,p-DDT	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
o,p-Methoxychlor	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
o,p-TDE (DDD)	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
Endosulphan I	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
Endosulphan II	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
Endosulphan Sulphate	-	-	•	<50	-	-	-	<50	μg/kg	Subcon
Endrin	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
Ethion	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
Dieldrin	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
Azinphos-methyl	-	-	-	<50	-	-	-	<50	μg/kg	Subcon
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Lab Sample ID	12/03975/9	12/03975/10	12/03975/11	12/03975/12	12/03975/13	12/03975/14	12/03975/15	12/03975/16		
Client Sample No										
Client Sample ID	TP10	TP11	TP13	TP14	TP34	TP35	TP36	TP37		
Depth to Top	0.20	0.10	0.20	0.10	0.20	0.10	0.10	0.10		
Depth To Bottom		0.20	0.30	0.20				0.20		
Date Sampled	30-Aug-12	30-Aug-12	30-Aug-12	30-Aug-12	29-Aug-12	29-Aug-12	29-Aug-12	29-Aug-12		₩
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	"	Method ref
Sample Matrix Code	5A	6AE	6AE	4A	6AE	6A	6AE	6AE	Units	Meth
PAH 16										
Acenaphthylene _A #	-	<0.01	-	<0.01	-	0.02	-	0.01	mg/kg	A-T-019s
Anthracene _A #	-	<0.01	-	<0.01	-	0.02	-	<0.01	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	0.03	-	0.03	-	0.28	-	0.18	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	0.03	-	0.02	-	0.27	-	0.18	mg/kg	A-T-019s
Benzo(b)fluoranthene _A	-	0.08	-	0.06	-	0.53	-	0.39	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	0.03	-	0.02	-	0.35	-	0.22	mg/kg	A-T-019s
Benzo(k)fluoranthene _A	-	0.02	-	<0.01	-	0.15	-	0.11	mg/kg	A-T-019s
Chrysene _A ^{M#}	-	0.05	-	0.03	-	0.42	-	0.26	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	-	<0.01	-	<0.01	-	0.03	-	0.02	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	-	0.04	-	0.02	-	0.64	-	0.38	mg/kg	A-T-019s
Fluorene _A ^{M#}	-	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	-	0.02	-	<0.01	-	0.15	-	0.14	mg/kg	A-T-019s
Naphthalene _A ^{M#}	-	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	-	<0.01	-	<0.01	-	0.26	-	0.12	mg/kg	A-T-019s
Pyrene _A ^{M#}	-	0.04	-	0.03	-	0.55	-	0.33	mg/kg	A-T-019s
Total PAH _A	-	0.34	-	0.20	-	3.68	-	2.34	mg/kg	A-T-019s



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Lab Sample ID	12/03975/17	12/03975/18	12/03975/19	12/03975/20	12/03975/21	12/03975/22	12/03975/23	12/03975/24		
Client Sample No										
Client Sample ID	TPD	TPI	TPL	TPO	TP1 (I)	TP2 (I)	TP3 (I)	TP4 (I)		
Depth to Top	0.10	0.20	0.30	0.30	0.10	0.20	0.20	0.10		
Depth To Bottom	0.20									
Date Sampled	30-Aug-12	28-Aug-12	29-Aug-12	28-Aug-12	28-Aug-12	28-Aug-12	28-Aug-12	29-Aug-12		eŧ
Sample Type	Soil - ES	s	Method ref							
Sample Matrix Code	6AE	6AE	6AE	6A	6E	6AE	6AE	6E	Units	Meth
Asbestos in soil _A #	-	-	NAD	-	-	-	-	NAD		A-T-045
Organic matter _D ^{M#}	-	-	-	-	6.6	-	-	2.5	% w/w	A-T-032 OM
Arsenic _D ^{M#}	8	8	8	7	8	7	6	7	mg/kg	A-T-024
Cadmium _D ^{M#}	<0.5	1.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	mg/kg	A-T-024
Copper _D ^{M#}	18	20	24	20	33	23	22	13	mg/kg	A-T-024
Chromium _D #	24	29	31	29	42	34	34	26	mg/kg	A-T-024
Lead _D ^{M#}	40	46	44	59	67	55	51	25	mg/kg	A-T-024
Mercury _D	0.25	0.27	0.36	0.51	0.47	0.34	0.58	0.28	mg/kg	A-T-024
Nickel _D ^{M#}	22	26	29	24	40	29	27	20	mg/kg	A-T-024
Selenium _D ^{M#}	<1	<1	<1	<1	1	<1	<1	<1	mg/kg	A-T-024
Zinc _D ^{M#}	49	59	214	62	80	65	63	50	mg/kg	A-T-024
Triazine Herbicides (x11)	-	-	-	-	-	-	Appended	-		Subcon
Pyrethroid (Pyrethrin) Insecticides (x6)	-	-	-	-	-	-	Appended	-		Subcon



Lab Sample ID 20397517 20397518 20397518 20397519 20397520 20397522 20397522 20397523 20397523 20397523 20397523 20397523 20397523 20397524							Project Rei				
Client Sample ID	Lab Sample ID	12/03975/17	12/03975/18	12/03975/19	12/03975/20	12/03975/21	12/03975/22	12/03975/23	12/03975/24		
Depth to Top	Client Sample No										
Depth To Bottom 0.20 Date Sampled 30-Aug-12 28-Aug-12 28-Aug-12	Client Sample ID	TPD	TPI	TPL	ТРО	TP1 (I)	TP2 (I)	TP3 (I)	TP4 (I)		
Date Sampled 30-Aug-12 28-Aug-12 29-Aug-12 28-Aug-12 28-Aug-12	Depth to Top	0.10	0.20	0.30	0.30	0.10	0.20	0.20	0.10		
Sample Type	Depth To Bottom	0.20									
Pest-C Mevinphos	Date Sampled	30-Aug-12	28-Aug-12	29-Aug-12	28-Aug-12	28-Aug-12	28-Aug-12	28-Aug-12	29-Aug-12		J e
Pest-C Mevinphos	Sample Type	Soil - ES	0	od r							
Pest-C Mevinphos -	Sample Matrix Code	6AE	6AE	6AE	6A	6E	6AE	6AE	6E	Units	Meth
Dichlorvos	Pest-c										
Diazinon	Mevinphos	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Diazinon	Dichlorvos	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Samma-Hoxachlorocyclohexane (HCH / Lindane) Heptachlor Aldrin		-	-	-	-	-	-	<50	-	μg/kg	Subcon
Heptachlor	Diazinon	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Aldrin		-	•	-	-	-	-	<50	-	μg/kg	Subcon
Deta-Hexachlorocyclohexane Color Lights Subcon Lights Lights	Heptachlor	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Methyl Parathion	Aldrin	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Malathion -		-	-	-	-	-	-	<50	-	μg/kg	Subcon
Fenitrothion	Methyl Parathion	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Heptachlor Epoxide -	Malathion	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Parathion -	Fenitrothion	-	•	•	-	-	-	<50	-	μg/kg	Subcon
р,р-DDE	Heptachlor Epoxide	-	-	-	-	-	-	<50	-	μg/kg	Subcon
р,p-DDT	Parathion	-	-	-	-	-	-	<50	-	μg/kg	Subcon
p,p-Methoxychlor -	p,p-DDE	-	-	-	-	-	-	<50	-	μg/kg	Subcon
р,р-тDE (DDD)	p,p-DDT	-	-	-	-	-	-	<50	-	μg/kg	Subcon
о,p-DDE	p,p-Methoxychlor	-	-	-	-	-	-	<50	-	μg/kg	Subcon
о,p-DDT	p,p-TDE (DDD)	-	-	-	-	-	-	<50	-	μg/kg	Subcon
о,p-Methoxychlor -	o,p-DDE	-	-	-	-	-	-	<50	-	μg/kg	Subcon
o,p-TDE (DDD)	o,p-DDT	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Endosulphan I -	o,p-Methoxychlor	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Endosulphan II - - - - - - - μg/kg Subcon Endosulphan Sulphate - - - - - - - - μg/kg Subcon	o,p-TDE (DDD)	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Endosulphan Sulphate	Endosulphan I	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Lindosdiphan Sulphate	Endosulphan II	•	-	-	-	-	-	<50	-	μg/kg	Subcon
Endrin μg/kg ^{Subcon}	Endosulphan Sulphate	-	-	-	-	-	-	<50	-	μg/kg	Subcon
	Endrin	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Ethion <50 - μg/kg ^{Subcon}	Ethion	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Dieldrin <50 - μg/kg ^{Subcon}	Dieldrin	-	-	-	-	-	-	<50	-	μg/kg	Subcon
Azinphos-methyl <50 - μg/kg ^{Subcon}	Azinphos-methyl	-	-	-	-	-	-	<50	-	μg/kg	Subcon



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Lab Sample ID	12/03975/17	12/03975/18	12/03975/19	12/03975/20	12/03975/21	12/03975/22	12/03975/23	12/03975/24		
Client Sample No										
Client Sample ID	TPD	TPI	TPL	TPO	TP1 (I)	TP2 (I)	TP3 (I)	TP4 (I)		
Depth to Top	0.10	0.20	0.30	0.30	0.10	0.20	0.20	0.10		
Depth To Bottom	0.20									
Date Sampled	30-Aug-12	28-Aug-12	29-Aug-12	28-Aug-12	28-Aug-12	28-Aug-12	28-Aug-12	29-Aug-12		-
Sample Type	Soil - ES	Soil - ES	Soil - ES	(n	Method ref					
Sample Matrix Code	6AE	6AE	6AE	6A	6E	6AE	6AE	6E	Units	Meth
PAH 16										
Acenaphthylene _A #	<0.01	-	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Anthracene _A #	<0.01	-	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.02	-	0.04	0.04	0.03	-	-	-	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.02	-	0.06	0.03	0.03	-	-	-	mg/kg	A-T-019s
Benzo(b)fluoranthene _A	0.05	-	0.12	0.07	0.06	-	-	-	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.01	-	0.07	0.03	0.03	-	-	-	mg/kg	A-T-019s
Benzo(k)fluoranthene _A	0.01	-	0.03	0.02	0.01	-	-	-	mg/kg	A-T-019s
Chrysene _A ^{M#}	0.03	-	0.07	0.07	0.04	-	-	-	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	<0.01	-	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	0.01	-	0.06	0.08	0.03	-	-	-	mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01	-	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	0.01	-	0.02	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.01	-	<0.01	<0.01	<0.01	-	-	-	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	<0.01	-	<0.01	0.03	<0.01	-	-	-	mg/kg	A-T-019s
Pyrene _A ^{M#}	0.02	-	0.06	0.07	0.03	-	-	-	mg/kg	A-T-019s
Total PAH _A	0.19	-	0.52	0.44	0.24	-	-	-	mg/kg	A-T-019s



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Lab Sample ID	12/03975/25	12/03975/26	12/03975/27	12/03975/28	12/03975/29				
Client Sample No									
Client Sample ID	TP5 (I)	TP6 (I)	TP7 (I)	TP8 (I)	TP9 (I)				
Depth to Top	0.20	0.20	0.20	0.10	0.20				
Depth To Bottom									
Date Sampled	29-Aug-12	29-Aug-12	29-Aug-12	29-Aug-12	30-Aug-12				e
Sample Type	Soil - ES			s	Method ref				
Sample Matrix Code	6AE	6E	6AE	6A	6EA			Units	Meth
Asbestos in soil _A #	-	-	-	-	NAD				A-T-045
Organic matter _D ^{M#}	-	-	-	-	3.4			% w/w	A-T-032 OM
Arsenic _D ^{M#}	9	14	7	7	9			mg/kg	A-T-024
Cadmium _D ^{M#}	<0.5	0.5	<0.5	<0.5	<0.5			mg/kg	A-T-024
Copper _D ^{M#}	14	19	21	21	23			mg/kg	A-T-024
Chromium _D #	26	33	34	31	32			mg/kg	A-T-024
Lead _D ^{M#}	24	43	34	30	47			mg/kg	A-T-024
Mercury _D	<0.17	0.38	0.22	0.30	0.36			mg/kg	A-T-024
Nickel _D ^{M#}	21	24	20	21	20			mg/kg	A-T-024
Selenium _D ^{M#}	<1	1	<1	<1	<1			mg/kg	A-T-024
Zinc _D ^{M#}	48	57	51	47	52			mg/kg	A-T-024



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Lab Sample ID	12/03975/25	12/03975/26	12/03975/27	12/03975/28	12/03975/29				
Client Sample No									
Client Sample ID	TP5 (I)	TP6 (I)	TP7 (I)	TP8 (I)	TP9 (I)				
Depth to Top	0.20	0.20	0.20	0.10	0.20				
Depth To Bottom									
Date Sampled	29-Aug-12	29-Aug-12	29-Aug-12	29-Aug-12	30-Aug-12				ef
Sample Type	Soil - ES			vo.	Method ref				
Sample Matrix Code	6AE	6E	6AE	6A	6EA			Units	Meth
PAH 16									
Acenaphthylene _A #	<0.01	-	-	-	<0.01			mg/kg	A-T-019s
Anthracene _A #	<0.01	-	-	-	<0.01			mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.02	-	-	-	0.18			mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.01	-	-	-	0.18			mg/kg	A-T-019s
Benzo(b)fluoranthene _A	0.04	-	-	-	0.36			mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.01	•	-	-	0.19			mg/kg	A-T-019s
Benzo(k)fluoranthene _A	0.01	-	-	-	0.09			mg/kg	A-T-019s
Chrysene _A ^{M#}	0.03	•	-	-	0.27			mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	<0.01	•	-	-	0.01			mg/kg	A-T-019s
Fluoranthene _A ^{M#}	0.03	•	-	-	0.40			mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01	-	-	-	<0.01			mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	<0.01	-	-	-	0.13			mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.01	-	-	-	<0.01			mg/kg	A-T-019s
Phenanthrene _A ^{M#}	<0.01	-	-	-	0.15			mg/kg	A-T-019s
Pyrene _A ^{M#}	0.03	-	-	-	0.34			mg/kg	A-T-019s
Total PAH _A	0.20	-	-	-	2.31			mg/kg	A-T-019s



FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 12/03993

Issue Number: Date: 25 September, 2012

Client: **RSK Environment Ltd Hemel**

> 18 Frogmore Road Hemel Hempstead

Hertfordshire

IJK

HP3 9RT

Project Manager: Nigel Austin / Ben Coulston / Oliver Pengilly

Project Name: NIAB Phase 1

Project Ref: 25459

Order No: Not specified **Date Samples Received:** 05/09/12 **Date Instructions Received:** 05/09/12 **Date Analysis Completed:** 25/09/12

Prepared by: Approved by:

Melanie Marshall Iain Haslock

Analytical Consultant Laboratory Coordinator

Notes - Soil analysis

All results are reported as dry weight (<40 $^{\circ}$ C).

For samples with Matrix Codes 1 - 6 inert stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on dried & crushed sample.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts. Superscript "M" indicates method accredited to MCERTS. Results in italics are associated with a control limit flag.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling.

Predominant Matrix Codes - 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.

Samples with Matrix Code 7 are not predominantly a SAND/LOA mix and are not covered by our MCERTS accreditation.

Secondary Matrix Codes - A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis. NDP indicates No Determination Possible. NAD indicates No Asbestos Detected.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.





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Lab Sample ID	12/03993/1	12/03993/2	12/03993/3	12/03993/4	12/03993/5	12/03993/6	12/03993/7	12/03993/8		
Client Sample No										
Client Sample ID	TP9	TP12	TP15	TP16	TP17	TP18	TP19	TP20		
Depth to Top	0.10	0.20	0.10	0.15	0.10	0.15	0.10	0.20		
Depth To Bottom	0.20	0.30		0.25	0.20		0.20			
Date Sampled	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12		ef
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	s	Method ref
Sample Matrix Code	4AE	4AE	4AE	4AE	4AE	4AE	4AE	4AE	Units	Meth
Asbestos in soil _A #	NAD	-	-	-	-	NAD	NAD	-		A-T-045
pH _D ^{M#}	-	-	-	-	-	-	8.04	-	рН	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	-	-	-	-	-	<0.01	-	g/l	A-T-026s
Organic matter _D ^{M#}	-	-	-	-	-	2.8	-	-	% w/w	A-T-032 OM
Arsenic _D ^{M#}	10	10	11	8	9	10	12	8	mg/kg	A-T-024
Cadmium _D ^{M#}	1.5	1.3	1.5	1.3	1.2	1.3	1.6	1.2	mg/kg	A-T-024
Copper _D ^{M#}	20	14	19	16	15	19	19	12	mg/kg	A-T-024
Chromium _D [#]	24	24	24	25	25	29	27	24	mg/kg	A-T-024
Lead _D ^{M#}	38	31	42	35	31	40	40	24	mg/kg	A-T-024
Mercury _D	<0.17	<0.17	0.20	0.21	0.19	0.21	0.33	0.47	mg/kg	A-T-024
Nickel _D ^{M#}	24	19	21	19	19	23	24	20	mg/kg	A-T-024
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	A-T-024
Zinc _D ^{M#}	57	46	58	52	48	59	65	48	mg/kg	A-T-024



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Lab Sample ID	12/03993/1	12/03993/2	12/03993/3	12/03993/4	12/03993/5	12/03993/6	12/03993/7	12/03993/8		
Client Sample No										
Client Sample ID	TP9	TP12	TP15	TP16	TP17	TP18	TP19	TP20		
Depth to Top	0.10	0.20	0.10	0.15	0.10	0.15	0.10	0.20		
Depth To Bottom	0.20	0.30		0.25	0.20		0.20			
Date Sampled	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12		e
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	(0	Method ref
Sample Matrix Code	4AE	4AE	4AE	4AE	4AE	4AE	4AE	4AE	Units	Meth
PAH 16										
Acenaphthene _A ^{M#}	-	<0.01	<0.01	-	-	0.13	<0.01	-	mg/kg	A-T-019s
Acenaphthylene _A #	-	<0.01	<0.01	-	-	<0.01	<0.01	-	mg/kg	A-T-019s
Anthracene _A #	-	<0.01	<0.01	-	-	0.05	<0.01	-	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	0.07	0.02	-	-	0.04	0.02	-	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	0.03	0.02	-	-	0.02	0.01	-	mg/kg	A-T-019s
Benzo(b)fluoranthene _A	-	0.08	0.07	-	-	0.08	0.07	-	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	0.03	0.04	-	-	0.04	0.03	-	mg/kg	A-T-019s
Benzo(k)fluoranthene _A	-	0.02	0.02	-	-	0.01	0.02	-	mg/kg	A-T-019s
Chrysene _A ^{M#}	-	0.08	0.04	-	-	0.08	0.05	-	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	-	<0.01	<0.01	-	-	<0.01	<0.01	-	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	-	0.12	0.07	-	-	0.15	0.07	-	mg/kg	A-T-019s
Fluorene _A ^{M#}	-	<0.01	<0.01	-	-	0.07	<0.01	-	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	-	0.02	0.02	-	-	0.01	0.01	-	mg/kg	A-T-019s
Naphthalene _A ^{M#}	-	<0.01	0.13	-	-	0.04	<0.01	-	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	-	0.02	0.03	-	-	0.21	0.03	-	mg/kg	A-T-019s
Pyrene _A ^{M#}	-	0.09	0.06	-	-	0.12	0.06	-	mg/kg	A-T-019s
Total PAH _A	-	0.57	0.53	-	-	1.05	0.37	-	mg/kg	A-T-019s



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Lab Sample ID	12/03993/9	12/03993/10	12/03993/11	12/03993/12	12/03993/13	12/03993/14	12/03993/15	12/03993/16		
Client Sample No										
Client Sample ID	TP21	TP22	TP23	TP24	TP25	TP26	TP27	TP28		
Depth to Top	0.20	0.10	0.20	0.20	0.20	0.10	0.30	0.10		
Depth To Bottom	0.30		0.30	0.30		0.20				
Date Sampled	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12		-
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	ø	Method ref
Sample Matrix Code	4ABE	6AE	6E	6AE	4E	4E	4AE	4AE	Units	Meth
Asbestos in soil _A #	NAD	-	NAD	NAD	-	-	-	NAD		A-T-045
pH _D ^{M#}	-	-	-	-	-	-	-	-	рН	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	-	-	-	-	-	-	-	g/l	A-T-026s
Organic matter _D ^{M#}	3.2	-	-	-	2.5	-	-	-	% w/w	A-T-032 OM
Arsenic _D ^{M#}	8	8	8	10	12	12	10	7	mg/kg	A-T-024
Cadmium _D ^{M#}	1.3	1.4	1.4	1.1	1.4	1.2	1.1	1.2	mg/kg	A-T-024
Copper _D ^{M#}	14	15	18	13	16	16	15	19	mg/kg	A-T-024
Chromium _D #	26	28	31	26	30	27	26	24	mg/kg	A-T-024
Lead _D ^{M#}	25	28	41	29	41	45	37	31	mg/kg	A-T-024
Mercury _D	0.24	0.26	0.37	<0.17	0.26	0.27	0.22	0.17	mg/kg	A-T-024
Nickel _D ^{M#}	21	23	24	17	21	17	16	17	mg/kg	A-T-024
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	A-T-024
Zinc _D ^{M#}	53	52	58	39	50	42	38	38	mg/kg	A-T-024
Triazine Herbicides (x11)	-	-	-	Appended	-	-	-	-		Subcon
Pyrethroid (Pyrethrin) Insecticides (x6)	-	-	-	Appended	-	-	-	-		Subcon



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Lab Sample ID	12/03993/9	12/03993/10	12/03993/11	12/03993/12	12/03993/13	12/03993/14	12/03993/15	12/03993/16		
Client Sample No										
Client Sample ID	TP21	TP22	TP23	TP24	TP25	TP26	TP27	TP28		
Depth to Top	0.20	0.10	0.20	0.20	0.20	0.10	0.30	0.10		
Depth To Bottom	0.30		0.30	0.30		0.20				
Date Sampled	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12		eŧ
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	s	Method ref
Sample Matrix Code	4ABE	6AE	6E	6AE	4E	4E	4AE	4AE	Units	Meth
Pest-c										
Mevinphos	-	-	-	<50	-	-	-	-	μg/kg	Subcon
Dichlorvos	-	-	-	<50	-	-	-	-	μg/kg	Subcon
alpha-Hexachlorocyclohexane (HCH)	-	-	-	<50	-	-	-	-	μg/kg	Subcon
Diazinon				<50	-	-	-	-	μg/kg	Subcon
gamma-Hexachlorocyclohexane (HCH / Lindane)	-	•	-	<50	-	-	-	-	μg/kg	Subcon
Heptachlor	-	-	-	<50	-	-	-	-	μg/kg	Subcon
Aldrin	-	-	-	<50	-	-	-	-	μg/kg	Subcon
beta-Hexachlorocyclohexane (HCH)	-	-	-	<50	-	-	-	-	μg/kg	Subcon
Methyl Parathion	-	-	-	<50	-	-	-	-	μg/kg	Subcon
Malathion	-	-	-	<50	-	-	-	-	μg/kg	Subcon
Fenitrothion	•	•	-	<50	•	-	•	•	μg/kg	Subcon
Heptachlor Epoxide	•	•	•	<50	•	-	•	•	μg/kg	Subcon
Parathion (Ethyl Parathion)	•	•	•	<50	•	-	•	•	μg/kg	Subcon
p,p-DDE	-	-	-	<50	-	-	-	-	μg/kg	Subcon
p,p-DDT	-	-	-	<50	-	-	-	-	μg/kg	Subcon
p,p-Methoxychlor	-	-	-	<50	-	-	-	-	μg/kg	Subcon
p,p-TDE (DDD)	-	-	-	<50	-	-	-	-	μg/kg	Subcon
o,p-DDE	-	-	-	<50	-	-	-	-	μg/kg	Subcon
o,p-DDT	-	-	-	<50	-	-	-	-	μg/kg	Subcon
o,p-Methoxychlor	-	-	-	<50	-	-	-	-	μg/kg	Subcon
o,p-TDE (DDD)	-	-	-	<50	-	-	-	-	μg/kg	Subcon
Endosulphan I	-	-	-	<50	-	-	-	-	μg/kg	Subcon
Endosulphan II	-	-	-	<50	-	-	-	-	μg/kg	Subcon
Endosulphan Sulphate	-	-	-	<50	-	-	-	-	μg/kg	Subcon
Endrin	-	-	-	<50	-	-	-	-	μg/kg	Subcon
Ethion	-	-	-	<50	-	-	-	-	μg/kg	Subcon
Dieldrin	-	-	-	<50	-	-	-	-	μg/kg	Subcon
Azinphos-methyl	-	-	-	<50	-	-	-	-	μg/kg	Subcon



_					Cilent	Project Ref	. 25459			
Lab Sample ID	12/03993/9	12/03993/10	12/03993/11	12/03993/12	12/03993/13	12/03993/14	12/03993/15	12/03993/16		
Client Sample No										
Client Sample ID	TP21	TP22	TP23	TP24	TP25	TP26	TP27	TP28		
Depth to Top	0.20	0.10	0.20	0.20	0.20	0.10	0.30	0.10		
Depth To Bottom	0.30		0.30	0.30		0.20				
Date Sampled	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12	31-Aug-12		T
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	6	Method ref
Sample Matrix Code	4ABE	6AE	6E	6AE	4E	4E	4AE	4AE	Units	Meth
PAH 16										
Acenaphthene _A ^{M#}	-	<0.01	-	<0.01	-	<0.01	-	1.14	mg/kg	A-T-019s
Acenaphthylene _A #	-	<0.01	-	<0.01	-	<0.01	-	<0.01	mg/kg	A-T-019s
Anthracene _A #	-	<0.01	-	<0.01	•	<0.01	•	4.75	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	0.01	-	<0.01	•	<0.01	•	4.23	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	<0.01	-	<0.01	•	<0.01	•	2.38	mg/kg	A-T-019s
Benzo(b)fluoranthene _A	-	0.02	-	<0.01	-	0.03	-	3.87	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	0.01	-	<0.01	•	<0.01	•	1.37	mg/kg	A-T-019s
Benzo(k)fluoranthene _A	-	<0.01	-	<0.01	•	<0.01	•	1.35	mg/kg	A-T-019s
Chrysene _A ^{M#}	-	<0.01	-	<0.01	•	0.01	•	4.60	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	-	<0.01	-	<0.01	-	<0.01	-	0.21	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	-	0.03	-	0.02	-	0.06	-	12.4	mg/kg	A-T-019s
Fluorene _A ^{M#}	-	<0.01	-	<0.01	•	<0.01	•	1.94	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	-	<0.01	-	<0.01	•	<0.01	•	1.06	mg/kg	A-T-019s
Naphthalene _A ^{M#}	-	<0.01	-	<0.01	-	<0.01	-	0.31	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	-	<0.01	-	<0.01	-	0.03	-	17.1	mg/kg	A-T-019s
Pyrene _A ^{M#}	-	0.02	-	0.02	-	0.05	-	9.48	mg/kg	A-T-019s
Total PAH _A	-	0.10	-	0.03	•	0.18	•	66.2	mg/kg	A-T-019s



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Lab Sample ID	12/03993/17	12/03993/18	12/03993/19	12/03993/20	12/03993/21	12/03993/22	12/03993/23	12/03993/24		
Client Sample No										
Client Sample ID	TP29	TP30	TP31	TP32	TP33	TP38	TP39	TP9		
Depth to Top	0.10	0.10	0.10	0.30	0.20	0.30	0.10	1.50		
Depth To Bottom	0.20	0.30	0.20				0.20			
Date Sampled	31-Aug-12		ef							
Sample Type	Soil	S	Method ref							
Sample Matrix Code	4AE	6E	6AE	4E	6E	4E	6AE	4A	Units	Meth
Asbestos in soil _A #	-	-	NAD	-	-	NAD	-	-		A-T-045
pH _D ^{M#}	-	-	-	-	-	8.31	-	8.95	рН	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	-	-	-	-	-	<0.01	-	<0.01	g/l	A-T-026s
Organic matter _D ^{M#}	-	-	-	-	3.8	-	2.8	-	% w/w	A-T-032 OM
Arsenic _D ^{M#}	12	5	6	7	7	7	9	-	mg/kg	A-T-024
Cadmium _D ^{M#}	1.6	1.2	1.4	1.5	1.5	1.4	1.3	-	mg/kg	A-T-024
Copper _D ^{M#}	25	20	21	18	23	14	14	-	mg/kg	A-T-024
Chromium _D #	25	28	29	32	35	24	26	-	mg/kg	A-T-024
Lead _D ^{M#}	33	24	28	26	34	22	28	-	mg/kg	A-T-024
Mercury _D	0.22	0.29	0.29	0.21	0.29	0.29	0.24	-	mg/kg	A-T-024
Nickel _D ^{M#}	21	19	22	24	24	22	21	-	mg/kg	A-T-024
Selenium _D ^{M#}	<1	<1	<1	1	1	<1	<1	-	mg/kg	A-T-024
Zinc _D ^{M#}	42	40	42	39	50	37	47	-	mg/kg	A-T-024
Triazine Herbicides (x11)	-	-	-	Appended	-	-	Appended	-		Subcon
Pyrethroid (Pyrethrin) Insecticides (x6)	-	-	-	Appended	-	-	Appended	-		Subcon



						Project Rei				
Lab Sample ID	12/03993/17	12/03993/18	12/03993/19	12/03993/20	12/03993/21	12/03993/22	12/03993/23	12/03993/24		
Client Sample No										
Client Sample ID	TP29	TP30	TP31	TP32	TP33	TP38	TP39	TP9		
Depth to Top	0.10	0.10	0.10	0.30	0.20	0.30	0.10	1.50		
Depth To Bottom	0.20	0.30	0.20				0.20			
Date Sampled	31-Aug-12		ef							
Sample Type	Soil	s	Method ref							
Sample Matrix Code	4AE	6E	6AE	4E	6E	4E	6AE	4A	Units	Meth
Pest-c										
Mevinphos	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Dichlorvos	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
alpha-Hexachlorocyclohexane (HCH)	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Diazinon	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
gamma-Hexachlorocyclohexane (HCH / Lindane)	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Heptachlor	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Aldrin	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
beta-Hexachlorocyclohexane (HCH)	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Methyl Parathion	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Malathion	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Fenitrothion	-	•	•	<50	-	-	<50	•	μg/kg	Subcon
Heptachlor Epoxide	-	•	•	<50	-	-	<50	•	μg/kg	Subcon
Parathion (Ethyl Parathion)	-	•	•	<50	-	-	<50	•	μg/kg	Subcon
p,p-DDE	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
p,p-DDT	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
p,p-Methoxychlor	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
p,p-TDE (DDD)	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
o,p-DDE	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
o,p-DDT	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
o,p-Methoxychlor	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
o,p-TDE (DDD)	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Endosulphan I	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Endosulphan II	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Endosulphan Sulphate	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Endrin	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Ethion	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Dieldrin	-	-	-	<50	-	-	<50	-	μg/kg	Subcon
Azinphos-methyl	-	-	-	<50	-	-	<50	-	μg/kg	Subcon



					Chloric	Project nei	. 20.00			
Lab Sample ID	12/03993/17	12/03993/18	12/03993/19	12/03993/20	12/03993/21	12/03993/22	12/03993/23	12/03993/24		
Client Sample No										
Client Sample ID	TP29	TP30	TP31	TP32	TP33	TP38	TP39	TP9		
Depth to Top	0.10	0.10	0.10	0.30	0.20	0.30	0.10	1.50		
Depth To Bottom	0.20	0.30	0.20				0.20			
Date Sampled	31-Aug-12]							
Sample Type	Soil	,	Method ref							
Sample Matrix Code	4AE	6E	6AE	4E	6E	4E	6AE	4A	Units	Meth
PAH 16										
Acenaphthene _A ^{M#}	<0.01	-	<0.01	-	<0.01	<0.01	-	-	mg/kg	A-T-019s
Acenaphthylene _A #	<0.01	-	<0.01	-	<0.01	<0.01	-	-	mg/kg	A-T-019s
Anthracene _A #	0.01	-	<0.01	-	<0.01	<0.01	-	-	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.08	-	0.04	-	0.05	<0.01	-	-	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.11	-	0.04	-	0.04	<0.01	-	-	mg/kg	A-T-019s
Benzo(b)fluoranthene _A	0.22	-	0.10	-	0.10	<0.01	-	-	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.14	-	0.07	-	0.06	<0.01	-	-	mg/kg	A-T-019s
Benzo(k)fluoranthene _A	0.07	-	0.02	-	0.02	<0.01	-	-	mg/kg	A-T-019s
Chrysene _A ^{M#}	0.14	-	0.07	-	0.06	<0.01	-	-	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	<0.01	-	<0.01	-	<0.01	<0.01	-	-	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	0.17	-	0.11	-	0.11	<0.01	-	-	mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01	-	<0.01	-	<0.01	<0.01	-	-	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	0.09	-	0.03	-	0.04	<0.01	-	-	mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.01	-	0.02	-	<0.01	<0.01	-	-	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	0.07	-	0.06	-	0.02	<0.01	-	-	mg/kg	A-T-019s
Pyrene _A ^{M#}	0.15	-	0.10	-	0.10	<0.01	-	-	mg/kg	A-T-019s
Total PAH _A	1.25	-	0.67	-	0.58	<0.01	-	-	mg/kg	A-T-019s



Lab Sample ID	12/03993/33	12/03993/52					
Client Sample No							
Client Sample ID	TP33	TP28					
Depth to Top	3.50						
Depth To Bottom		0.10					
Date Sampled	31-Aug-12	03-Sep-12					e e
Sample Type	Soil	Soil				l "	Method ref
Sample Matrix Code	5	4AE				Units	Meth
pH _D ^{M#}	8.14	-				рН	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.12	-				g/l	A-T-026s



				Client	Project Ref	. 25459		
Lab Sample ID	12/03993/33	12/03993/52						
Client Sample No								
Client Sample ID	TP33	TP28 repeat						
Depth to Top	3.50							
Depth To Bottom		0.10						
Date Sampled	31-Aug-12	03-Sep-12						eŧ
Sample Type	Soil	Soil					,	Method ref
Sample Matrix Code	5	4AE					Units	Meth
PAH 16								
Acenaphthene _A ^{M#}	-	0.06					mg/kg	A-T-019s
Acenaphthylene _A #	-	<0.01					mg/kg	A-T-019s
Anthracene _A #	-	0.07					mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	0.15					mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	0.07					mg/kg	A-T-019s
Benzo(b)fluoranthene _A	-	0.15					mg/kg	A-T-019s
Benzo(ghi)perylene _A M#	-	0.06					mg/kg	A-T-019s
Benzo(k)fluoranthene _A	-	0.04					mg/kg	A-T-019s
Chrysene _A ^{M#}	-	0.17					mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	•	<0.01					mg/kg	A-T-019s
Fluoranthene _A ^{M#}	•	0.36					mg/kg	A-T-019s
Fluorene _A ^{M#}	•	0.06					mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	•	0.08					mg/kg	A-T-019s
Naphthalene _A ^{M#}	-	0.01					mg/kg	A-T-019s
Phenanthrene _A ^{M#}	-	0.29					mg/kg	A-T-019s
Pyrene _A ^{M#}	-	0.26					mg/kg	A-T-019s
Total PAH _A	-	1.84					mg/kg	A-T-019s



FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 12/04076

Issue Number: Date: 21 September, 2012

Client: **RSK Environment Ltd Hemel**

> 18 Frogmore Road Hemel Hempstead

Hertfordshire

IJK

HP3 9RT

Project Manager: Nigel Austin / Ben Coulston / Oliver Pengilly

Project Name: NIAB Phase 1

Project Ref: 25459

Order No: Not specified **Date Samples Received:** 10/09/12 **Date Instructions Received:** 10/09/12 **Date Analysis Completed:** 21/09/12

Prepared by: Approved by:

Melanie Marshall Liz Oliver

Project Coordinator Laboratory Coordinator

Notes - Soil analysis

All results are reported as dry weight (<40 $^{\circ}$ C).

For samples with Matrix Codes 1 - 6 inert stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on dried & crushed sample.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts. Superscript "M" indicates method accredited to MCERTS. Results in italics are associated with a control limit flag.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling.

Predominant Matrix Codes - 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.

Samples with Matrix Code 7 are not predominantly a SAND/LOA mix and are not covered by our MCERTS accreditation.

Secondary Matrix Codes - A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis. NDP indicates No Determination Possible. NAD indicates No Asbestos Detected.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.





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Lab Sample ID	12/04076/1	12/04076/2	12/04076/3	12/04076/4	12/04076/5	12/04076/6	12/04076/7	12/04076/8		
Client Sample No										
Client Sample ID	WSB	WSE	WSH	WS1	WS2	WS3	WS4	WS5		
Depth to Top	0.10	0.10	0.20	0.20	0.20	0.10	0.10	0.05		
Depth To Bottom	0.20	0.20	0.30	0.30			0.20	0.15		
Date Sampled	06-Sep-12	06-Sep-12	06-Sep-12	05-Sep-12	05-Sep-12	06-Sep-12	05-Sep-12	05-Sep-12		ef
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	s	Method ref
Sample Matrix Code	5AE	6AE	5AE	6AE	6E	6AE	6E	5AE	Units	Meth
Asbestos in soil _A #	NAD	NAD	-	NAD	-	NAD	NAD	NAD		A-T-045
pH _D ^{M#}	6.92	-	7.34	-	-	-	7.34	-	рН	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	0.10	-	<0.01	-	-	-	0.02	-	g/l	A-T-026s
Organic matter _D ^{M#}	2.0	-	-	3.5	-	3.1	-	-	% w/w	A-T-032 OM
Arsenic _D ^{M#}	9	7	12	7	9	10	27	5	mg/kg	A-T-024
Cadmium _D ^{M#}	0.6	0.6	0.7	0.6	0.6	0.7	0.9	0.7	mg/kg	A-T-024
Copper _D ^{M#}	21	17	20	25	18	21	28	20	mg/kg	A-T-024
Chromium _D #	26	37	25	42	42	37	48	45	mg/kg	A-T-024
Lead _D ^{M#}	52	46	52	80	39	73	55	36	mg/kg	A-T-024
Mercury _D	0.19	0.26	<0.17	0.36	0.37	0.21	0.45	0.24	mg/kg	A-T-024
Nickel _D ^{M#}	20	28	24	35	36	29	45	34	mg/kg	A-T-024
Selenium _D ^{M#}	<1	<1	<1	<1	1	2	2	<1	mg/kg	A-T-024
Zinc _D ^{M#}	64	60	55	71	59	62	70	60	mg/kg	A-T-024



						Project Rei				
Lab Sample ID	12/04076/1	12/04076/2	12/04076/3	12/04076/4	12/04076/5	12/04076/6	12/04076/7	12/04076/8		
Client Sample No										
Client Sample ID	WSB	WSE	WSH	WS1	WS2	WS3	WS4	WS5		
Depth to Top	0.10	0.10	0.20	0.20	0.20	0.10	0.10	0.05		
Depth To Bottom	0.20	0.20	0.30	0.30			0.20	0.15		
Date Sampled	06-Sep-12	06-Sep-12	06-Sep-12	05-Sep-12	05-Sep-12	06-Sep-12	05-Sep-12	05-Sep-12		J e
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	"	Method ref
Sample Matrix Code	5AE	6AE	5AE	6AE	6E	6AE	6E	5AE	Units	Meth
Pest-c										
Mevinphos	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Dichlorvos	-	<50	-	-	-	-	-	-	μg/kg	Subcon
alpha-Hexachlorocyclohexane (HCH)	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Diazinon	-	<50	-	-	-	-	-	-	μg/kg	Subcon
gamma-Hexachlorocyclohexane (HCH / Lindane)	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Heptachlor	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Aldrin	-	<50	-	-	-	-	-	-	μg/kg	Subcon
beta-Hexachlorocyclohexane (HCH)	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Methyl Parathion	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Malathion	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Fenitrothion	-	<50	•	-	-	-	-	-	μg/kg	Subcon
Heptachlor Epoxide	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Parathion	-	<50	-	-	-	-	-	-	μg/kg	Subcon
p,p-DDE	-	<50	-	-	-	-	-	-	μg/kg	Subcon
p,p-DDT	-	<50	-	-	-	-	-	-	μg/kg	Subcon
p,p-Methoxychlor	-	<50	-	-	-	-	-	-	μg/kg	Subcon
p,p-TDE (DDD)	-	<50	-	-	-	-	-	-	μg/kg	Subcon
o,p-DDE	-	<50	-	-	-	-	-	-	μg/kg	Subcon
o,p-DDT	-	<50	-	-	-	-	-	-	μg/kg	Subcon
o,p-Methoxychlor	-	<50	-	-	-	-	-	-	μg/kg	Subcon
o,p-TDE (DDD)	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Endosulphan I	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Endosulphan II	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Endosulphan Sulphate	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Endrin	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Ethion	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Dieldrin	-	<50	-	-	-	-	-	-	μg/kg	Subcon
Azinphos-methyl	-	<50	-	-	-	-	-	-	μg/kg	Subcon



Lab Sample ID	A-T-019s A-T-019s A-T-019s A-T-019s A-T-019s
Client Sample ID WSB WSE WSH WS1 WS2 WS3 WS4 WS5	A-T-019s A-T-019s A-T-019s A-T-019s A-T-019s
Depth to Top	A-T-019s A-T-019s A-T-019s A-T-019s A-T-019s
Depth To Bottom	A-T-019s A-T-019s A-T-019s A-T-019s A-T-019s
Date Sampled 06-Sep-12 06-Sep-12 05-Sep-12 0	A-T-019s A-T-019s A-T-019s A-T-019s A-T-019s
Sample Type Soil	A-T-019s A-T-019s A-T-019s A-T-019s A-T-019s
Sample Matrix Code 5AE 6AE 5AE 6AE 6E 6AE 6E 5AE 6AE	A-T-019s A-T-019s A-T-019s A-T-019s A-T-019s
PAH 16 Co.01 Co.01 <t< td=""><td>A-T-019s A-T-019s A-T-019s A-T-019s A-T-019s</td></t<>	A-T-019s A-T-019s A-T-019s A-T-019s A-T-019s
Acenaphthene _A ^{M#} <0.01	A-T-019s A-T-019s A-T-019s A-T-019s
Acenaphthylene _A # <0.01	A-T-019s A-T-019s A-T-019s A-T-019s
Anthracene _A [#] <0.01 <0.01 - <0.01 <0.01 - mg/kg Benzo(a)anthracene _A ^{M#} 0.07 0.04 - 0.03 0.15 - mg/kg Benzo(a)pyrene _A ^{M#} 0.07 0.07 - 0.04 0.15 - mg/kg	A-T-019s A-T-019s A-T-019s
Benzo(a)anthracene _A ^{M#} 0.07 0.04 - 0.03 - - 0.15 - mg/kg Benzo(a)pyrene _A ^{M#} 0.07 0.07 - 0.04 - - 0.15 - mg/kg	A-T-019s A-T-019s
Benzo(a)pyrene _A ^{M#} 0.07 0.07 - 0.04 0.15 - mg/kg	A-T-019s
Benzo(b)fluorantheneA 0.13 0.09 - 0.03 - - 0.15 - mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#} 0.06 0.04 - 0.02 - - 0.08 - mg/kg	A-T-019s
Benzo(k)fluoranthene _A 0.03 0.01 - 0.01 0.05 - mg/kg	A-T-019s
Chrysene _A ^{M#} 0.08 0.05 - 0.02 0.14 - mg/kg	A-T-019s
Dibenzo(ah)anthracene _A 0.02 0.01 - <0.01 - 0.02 - mg/kg	A-T-019s
Fluoranthene _A ^{M#} 0.09 0.06 - 0.02 0.23 - mg/kg	A-T-019s
Fluorene _A ^{M#} <0.01 <0.01 - <0.01 <0.01 - mg/kg	A-T-019s
Indeno(123-cd)pyrene _A # 0.06 0.04 - 0.01 0.08 - mg/kg	A-T-019s
Naphthalene _A ^{M#} <0.01 <0.01 - <0.01 <0.01 - mg/kg	A-T-019s
Phenanthrene _A ^{M#} <0.01 <0.01 - <0.01 - 0.08 - mg/kg	A-T-019s
Pyrene _A ^{M#} 0.08 0.05 - 0.02 0.20 - mg/kg	A-T-019s
Total PAH _A 0.71 0.48 - 0.22 1.34 - mg/kg	A-T-019s
Pyrethroids	
Cyfluthrin - <0.1 mg/kg	Subcon
Cyhalothrin - <0.1 mg/kg	Subcon
Cypermethrin - <0.1 mg/kg	Subcon
Deltamethrin - <0.1 mg/kg	Subcon
Fenvalerate - <0.1 mg/kg	Subcon
Permethrin - <0.1 mg/kg	Subcon



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Lab Sample ID	12/04076/1	12/04076/2	12/04076/3	12/04076/4	12/04076/5	12/04076/6	12/04076/7	12/04076/8		
Client Sample No										
Client Sample ID	WSB	WSE	WSH	WS1	WS2	WS3	WS4	WS5		
Depth to Top	0.10	0.10	0.20	0.20	0.20	0.10	0.10	0.05		
Depth To Bottom	0.20	0.20	0.30	0.30			0.20	0.15		
Date Sampled	06-Sep-12	06-Sep-12	06-Sep-12	05-Sep-12	05-Sep-12	06-Sep-12	05-Sep-12	05-Sep-12		ef
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	σ.	Method ref
Sample Matrix Code	5AE	6AE	5AE	6AE	6E	6AE	6E	5AE	Units	Meth
Triazines (x11)										
Ametryn	-	<0.2	-	-	-	-	-	-	mg/kg	Subcon
Atraton	-	<0.1	-	-	-	-	-	-	mg/kg	Subcon
Atrazine	-	<0.02	-	-	-	-	-	-	mg/kg	Subcon
Cyanazine	-	<0.02	-	-	-	-	-	-	mg/kg	Subcon
Prometon	-	<0.1	-	-	-	-	-	-	mg/kg	Subcon
Prometryn	-	<0.02	-	-	-	-	-	-	mg/kg	Subcon
Propazine	-	<0.02	-	-	-	-	-	-	mg/kg	Subcon
Simazine	-	<0.02	-	-	-	-	-	-	mg/kg	Subcon
Simetryn	-	<0.1	-	-	-	-	-	-	mg/kg	Subcon
Terbuthylazine	-	<0.02	-	-	-	-	-	-	mg/kg	Subcon
Terbutryn	-	<0.02	-	-	-	-	-	-	mg/kg	Subcon



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Lab Sample ID	12/04076/9	12/04076/10					
Client Sample No							
Client Sample ID	WS6	WS7					
Depth to Top	0.10	0.10					
Depth To Bottom	0.20					-	
Date Sampled	06-Sep-12	05-Sep-12					a
Sample Type	Soil	Soil				"	Method ref
Sample Matrix Code	6E	4AE				Units	Meth
Asbestos in soil _A #	NAD	-					A-T-045
Organic matter _D ^{M#}	2.8	-				% w/w	A-T-032 OM
Arsenic _D ^{M#}	7	9				mg/kg	A-T-024
Cadmium _D ^{M#}	0.8	0.8				mg/kg	A-T-024
Copper _D ^{M#}	19	16				mg/kg	A-T-024
Chromium _D #	43	27				mg/kg	A-T-024
Lead _D ^{M#}	44	33				mg/kg	A-T-024
Mercury _D	0.37	0.43				mg/kg	A-T-024
Nickel _D ^{M#}	32	22				mg/kg	A-T-024
Selenium _D ^{M#}	2	2				mg/kg	A-T-024
Zinc _D ^{M#}	61	54				mg/kg	A-T-024



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Lab Sample ID	12/04076/9	12/04076/10						
Client Sample No								
Client Sample ID	WS6	WS7						
Depth to Top	0.10	0.10						
Depth To Bottom	0.20							
Date Sampled	06-Sep-12	05-Sep-12						± .
Sample Type	Soil	Soil						Method ref
Sample Matrix Code	6E	4AE					Units	Meth
PAH 16								
Acenaphthene _A ^{M#}	<0.01	-					mg/kg	A-T-019s
Acenaphthylene _A #	<0.01	-					mg/kg	A-T-019s
Anthracene _A #	0.02	-					mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.07	-					mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.07	-					mg/kg	A-T-019s
Benzo(b)fluoranthene _A	0.09	-					mg/kg	A-T-019s
Benzo(ghi)perylene _A M#	0.06	-					mg/kg	A-T-019s
Benzo(k)fluoranthene _A	0.05	-					mg/kg	A-T-019s
Chrysene _A ^{M#}	0.07	-					mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	0.05	-					mg/kg	A-T-019s
Fluoranthene _A ^{M#}	0.07	-					mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01	-					mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	0.07	-					mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.01	-					mg/kg	A-T-019s
Phenanthrene _A ^{M#}	<0.01	-					mg/kg	A-T-019s
Pyrene _A ^{M#}	0.06	-					mg/kg	A-T-019s
Total PAH _A	0.70	-					mg/kg	A-T-019s



FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 12/04180

Issue Number: Date: 27 September, 2012

Client: **RSK Environment Ltd Hemel**

> 18 Frogmore Road Hemel Hempstead

Hertfordshire

IJK

HP3 9RT

Project Manager: Nigel Austin / Ben Coulston / Oliver Pengilly

Project Name: NIAB Phase 1

Project Ref: 25459

Order No: Not specified **Date Samples Received:** 14/09/12 **Date Instructions Received:** 14/09/12 **Date Analysis Completed:** 27/09/12

Prepared by: Approved by:

Melanie Marshall Liz Oliver

Project Coordinator Laboratory Coordinator

Notes - Soil analysis

All results are reported as dry weight (<40 $^{\circ}$ C).

For samples with Matrix Codes 1 - 6 inert stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on dried & crushed sample.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts. Superscript "M" indicates method accredited to MCERTS. Results in italics are associated with a control limit flag.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling.

Predominant Matrix Codes - 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.

Samples with Matrix Code 7 are not predominantly a SAND/LOA mix and are not covered by our MCERTS accreditation.

Secondary Matrix Codes - A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis. NDP indicates No Determination Possible. NAD indicates No Asbestos Detected.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.





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Lab Sample ID	12/04180/1	12/04180/2	12/04180/3	12/04180/4	12/04180/5	12/04180/6	12/04180/7	12/04180/8		
Client Sample No										
Client Sample ID	WS8	WS9	WS10	WS11	WS12	WS13	WS14	WS15		
Depth to Top	0.30	0.10	0.20	0.40	0.20	0.30	0.10	0.20		
Depth To Bottom	0.40				0.30		0.20	0.30		
Date Sampled	07-Sep-12	07-Sep-12	10-Sep-12	07-Sep-12	10-Sep-12	07-Sep-12	07-Sep-12	10-Sep-12		<u>+</u>
Sample Type	Soil - ES	Soil - ES	Soil - ES	<i>(</i> 0	Method ref					
Sample Matrix Code	6A	4A	6A	6A	6A	6	6A	6AE	Units	Meth
Asbestos in soil _A #	NAD	NAD	-	-	NAD	NAD	NAD	NAD		A-T-045
Organic matter _D ^{M#}	1.6	-	-	2.2	-	2.4	-	-	% w/w	A-T-032 OM
Arsenic _D ^{M#}	9	9	7	8	6	8	7	6	mg/kg	A-T-024
Cadmium _D ^{M#}	1.3	1.6	1.3	1.3	1.4	1.5	1.5	1.3	mg/kg	A-T-024
Copper _D ^{M#}	14	19	14	14	13	14	14	12	mg/kg	A-T-024
Chromium _D #	20	21	20	20	23	23	22	22	mg/kg	A-T-024
Lead _D ^{M#}	29	44	25	33	24	29	23	20	mg/kg	A-T-024
Mercury _D	<0.17	<0.17	<0.17	<0.17	0.20	<0.17	0.19	<0.17	mg/kg	A-T-024
Nickel _D ^{M#}	18	19	18	17	20	18	19	18	mg/kg	A-T-024
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	A-T-024
Zinc _D ^{M#}	47	57	46	45	41	55	46	42	mg/kg	A-T-024



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Lab Sample ID	12/04180/1	12/04180/2	12/04180/3	12/04180/4	12/04180/5	12/04180/6	12/04180/7	12/04180/8		
Client Sample No										
Client Sample ID	WS8	WS9	WS10	WS11	WS12	WS13	WS14	WS15		
Depth to Top	0.30	0.10	0.20	0.40	0.20	0.30	0.10	0.20		
Depth To Bottom	0.40				0.30		0.20	0.30		
Date Sampled	07-Sep-12	07-Sep-12	10-Sep-12	07-Sep-12	10-Sep-12	07-Sep-12	07-Sep-12	10-Sep-12		-
Sample Type	Soil - ES	Soil - ES	Soil - ES	s	Method ref					
Sample Matrix Code	6A	4A	6A	6A	6A	6	6A	6AE	Units	Meth
PAH 16										
Acenaphthene _A ^{M#}	<0.01	<0.01	-	-	0.04	-	<0.01	<0.01	mg/kg	A-T-019s
Acenaphthylene _A #	<0.01	<0.01	-	-	<0.01	-	<0.01	<0.01	mg/kg	A-T-019s
Anthracene _A #	<0.01	<0.01	-	-	<0.01	-	<0.01	<0.01	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.01	0.03	-	-	<0.01	-	<0.01	<0.01	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.01	0.03	-	-	<0.01	-	<0.01	<0.01	mg/kg	A-T-019s
Benzo(b)fluoranthene _A	0.03	0.10	-	-	<0.01	-	<0.01	<0.01	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.01	0.04	-	-	<0.01	-	<0.01	<0.01	mg/kg	A-T-019s
Benzo(k)fluoranthene _A	<0.01	<0.01	-	-	<0.01	-	<0.01	<0.01	mg/kg	A-T-019s
Chrysene _A ^{M#}	<0.01	0.06	-	-	<0.01	-	<0.01	<0.01	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	<0.01	<0.01	-	-	<0.01	-	<0.01	<0.01	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	0.03	0.07	-	-	0.02	-	0.02	<0.01	mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	-	-	<0.01	-	<0.01	<0.01	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	<0.01	<0.01	-	-	<0.01	-	<0.01	<0.01	mg/kg	A-T-019s
Naphthalene _A ^{M#}	0.02	<0.01	-	-	0.01	-	<0.01	0.02	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	<0.01	0.03	-	-	0.02	-	<0.01	<0.01	mg/kg	A-T-019s
Pyrene _A ^{M#}	0.02	0.06	-	-	0.02	-	0.01	<0.01	mg/kg	A-T-019s
Total PAH _A	0.12	0.44	-	-	0.12	-	0.03	0.02	mg/kg	A-T-019s



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Lab Sample ID	12/04180/9	12/04180/10	12/04180/11	12/04180/12	12/04180/13	12/04180/14	12/04180/15	12/04180/16		
Client Sample No										
Client Sample ID	WS16	WS17	WS18	WS19	WS20	WS21	WS22	WS23		
Depth to Top	0.10	0.05	0.20	0.10	0.60	0.05	0.20	0.50		
Depth To Bottom	0.20	0.15	0.30	0.20	0.70	0.15	0.30	0.60		
Date Sampled	07-Sep-12	12-Sep-12	12-Sep-12	10-Sep-12	12-Sep-12	12-Sep-12	12-Sep-12	12-Sep-12		-
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	(0	Method ref
Sample Matrix Code	6A	6E	6AB	6	5A	6AB	6AB	5A	Units	Meth
Asbestos in soil _A #	-	-	NAD	-	-	-	NAD	-		A-T-045
Organic matter _D ^{M#}	1.4	-	-	-	0.3	-	2.6	0.5	% w/w	A-T-032 OM
Arsenic _D ^{M#}	8	17	14	15	9	5	8	6	mg/kg	A-T-024
Cadmium _D ^{M#}	1.3	1.7	1.7	1.6	1.3	1.3	1.4	1.2	mg/kg	A-T-024
Copper _D ^{M#}	11	56	23	20	7	18	27	9	mg/kg	A-T-024
Chromium _D #	17	31	35	31	11	28	24	19	mg/kg	A-T-024
Lead _D ^{M#}	23	76	48	49	6	24	31	7	mg/kg	A-T-024
Mercury _D	<0.17	0.22	<0.17	<0.17	0.22	0.18	<0.17	<0.17	mg/kg	A-T-024
Nickel _D ^{M#}	17	30	20	20	14	17	18	18	mg/kg	A-T-024
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	A-T-024
Zinc _D ^{M#}	39	82	55	54	17	44	42	22	mg/kg	A-T-024



					Client	Project Ref	: 25459			
Lab Sample ID	12/04180/9	12/04180/10	12/04180/11	12/04180/12	12/04180/13	12/04180/14	12/04180/15	12/04180/16		
Client Sample No										
Client Sample ID	WS16	WS17	WS18	WS19	WS20	WS21	WS22	WS23		
Depth to Top	0.10	0.05	0.20	0.10	0.60	0.05	0.20	0.50		
Depth To Bottom	0.20	0.15	0.30	0.20	0.70	0.15	0.30	0.60		
Date Sampled	07-Sep-12	12-Sep-12	12-Sep-12	10-Sep-12	12-Sep-12	12-Sep-12	12-Sep-12	12-Sep-12		je
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil - ES	,	Method ref
Sample Matrix Code	6A	6E	6AB	6	5A	6AB	6AB	5A	Units	Meth
PAH 16										
Acenaphthene _A ^{M#}	-	-	-	-	-	-	<0.01	-	mg/kg	A-T-019s
Acenaphthylene _A #	-	-	-	-	-	-	<0.01	-	mg/kg	A-T-019s
Anthracene _A #	-	-	-	-	-	-	<0.01	-	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	-	-	-	-	-	<0.01	-	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	-	-	-	-	-	0.02	-	mg/kg	A-T-019s
Benzo(b)fluoranthene₄	-	-	-	-	-	-	0.05	-	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	-	-	-	-	-	0.03	-	mg/kg	A-T-019s
Benzo(k)fluoranthene _A	-	-	-	-	-	-	<0.01	-	mg/kg	A-T-019s
Chrysene _A ^{M#}	-	-	-	-	-	-	0.03	-	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	-	-	-	-	-	-	<0.01	-	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	-	-	-	-	-	-	0.05	-	mg/kg	A-T-019s
Fluorene _A ^{M#}	-	-	-	-	-	-	<0.01	-	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	-	-	-	-	-	-	<0.01	-	mg/kg	A-T-019s
Naphthalene _A ^{M#}	-	-	-	-	-	-	0.01	-	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	-	-	-	-	-	-	0.02	-	mg/kg	A-T-019s
Pyrene _A ^{M#}	-	-	-	-	-	-	0.04	-	mg/kg	A-T-019s
Total PAH _A	-	-	-	-	-	-	0.26	-	mg/kg	A-T-019s



Envirolab Job Number: 12/04180 Client Project Name: NIAB Phase 1

					Onent	Project Rei	. 20400		_
Lab Sample ID	12/04180/17	12/04180/18	12/04180/19	12/04180/20	12/04180/21	12/04180/22	12/04180/23		
Client Sample No									
Client Sample ID	WS24	WS24	WS10	WSM	внк	внс	WSM		
Depth to Top	0.40	0.10	0.80	0.10	0.00	0.00	0.30		
Depth To Bottom	0.50	0.20			0.50	0.50	0.40		
Date Sampled	10-Sep-12	10-Sep-12	10-Sep-12	06-Sep-12	28-Aug-12	28-Aug-12	06-Sep-12		ef
Sample Type	Soil - ES	s	Method ref						
Sample Matrix Code	5A	6	5	6ABE	6AE	4AE	4ABE	Units	Meth
Asbestos in soil _A #	-	-	-	NAD	-	-	-		A-T-045
Organic matter _D M#	-	-	-	-	-	-	0.9	% w/w	A-T-032 OM
Arsenic _D ^{M#}	10	6	8	11	7	9	9	mg/kg	A-T-024
Cadmium _D ^{M#}	1.7	1.5	1.9	1.6	1.7	1.5	1.7	mg/kg	A-T-024
Copper _D ^{M#}	12	15	14	23	20	18	14	mg/kg	A-T-024
Chromium _D #	28	28	37	26	28	24	26	mg/kg	A-T-024
Lead _D ^{M#}	11	25	13	42	32	42	18	mg/kg	A-T-024
Mercury _D	0.20	0.29	0.29	<0.17	0.25	<0.17	<0.17	mg/kg	A-T-024
Nickel _D ^{M#}	31	22	39	24	25	23	24	mg/kg	A-T-024
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1	<1	mg/kg	A-T-024
Zinc _D ^{M#}	40	54	42	88	77	54	54	mg/kg	A-T-024



Envirolab Job Number: 12/04180 Client Project Name: NIAB Phase 1

-					••	Project nei			
Lab Sample ID	12/04180/17	12/04180/18	12/04180/19	12/04180/20	12/04180/21	12/04180/22	12/04180/23		
Client Sample No									
Client Sample ID	WS24	WS24	WS10	WSM	внк	BHG	WSM		
Depth to Top	0.40	0.10	0.80	0.10	0.00	0.00	0.30		
Depth To Bottom	0.50	0.20			0.50	0.50	0.40		
Date Sampled	10-Sep-12	10-Sep-12	10-Sep-12	06-Sep-12	28-Aug-12	28-Aug-12	06-Sep-12		-
Sample Type	Soil - ES	"	Method ref						
Sample Matrix Code	5A	6	5	6ABE	6AE	4AE	4ABE	Units	Meth
PAH 16									
Acenaphthene _A ^{M#}	-	0.61	-	<0.01	-	-	-	mg/kg	A-T-019s
Acenaphthylene _A #	-	0.02	-	<0.01	-	-	-	mg/kg	A-T-019s
Anthracene _A #	-	0.07	-	<0.01	-	-	-	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	-	0.03	-	0.04	-	-	-	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	-	0.02	-	0.06	-	-	-	mg/kg	A-T-019s
Benzo(b)fluoranthene _A	-	0.07	-	0.11	-	-	-	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	-	0.01	-	0.07	-	-	-	mg/kg	A-T-019s
Benzo(k)fluoranthene _A	-	0.02	-	0.02	-	-	•	mg/kg	A-T-019s
Chrysene _A ^{M#}	-	0.07	-	0.07	-	-	•	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	-	<0.01	-	<0.01	-	-	•	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	-	0.15	-	0.08	-	-	-	mg/kg	A-T-019s
Fluorene _A ^{M#}	-	0.28	-	<0.01	-	-	-	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	-	<0.01	-	0.03	-	-	-	mg/kg	A-T-019s
Naphthalene _A ^{M#}	-	0.03	-	<0.01	-	-	-	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	-	0.30	-	0.03	-	-	-	mg/kg	A-T-019s
Pyrene _A ^{M#}	-	0.10	-	0.09	-	-	-	mg/kg	A-T-019s
Total PAH _A	-	1.79	-	0.61	-	-	-	mg/kg	A-T-019s



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Analytical Report

Envirolab Limited 7 & 8 Sandpits Business Park Mottram Road Hyde Cheshire, SK14 3AR

Date Received: Date Tested:

Report No:

12-28634/1

06/09/2012

07/09/2012 to 12/09/2012

Date Issued:

12/09/2012

Page:

1 of 1

For the attention of: lain Haslock

By email

3 soil samples received from Envirolab Limited (O/N: 727895; Project: 12/03993) in 100ml amber glass jars were analysed as shown below. Analytical methods employed are available on request. Results are reported on an as received basis unless otherwise specified.

Laboratory	reference	TUIEN	213294 12/03993/12 TP24 0.2-0.3m	213295 12/03993/20 TP32 0.3m 31/08	213296 12/03993/23 TP39 0.1-0.2m
cyfluthrin	[68359-37-5]	mg/kg	< 0.10	< 0.10	< 0.10
cyhalothrin	[91465-08-6]	mg/kg	< 0.10	< 0.10	< 0.10
cypermethrin	[52315-07-8]	mg/kg	< 0.10	< 0.10	< 0.10
deltamethrin	[52918-63-5]	mg/kg	< 0.10	< 0.10	< 0.10
fenvalerate	[51630-58-1]	mg/kg	< 0.10	< 0.10	< 0.10
permethrin	[52645-53-1]	mg/kg	< 0.10	< 0.10	< 0.10
atrazine	[1912-24-9]	mg/kg	< 0.02	< 0.02	< 0.02
cyanazine	[21725-46-2]	mg/kg	< 0.02	< 0.02	< 0.02
prometryn	[7287-19-6]	mg/kg	< 0.02	< 0.02	< 0.02
propazine	[139-40-2]	mg/kg	< 0.02	< 0.02	< 0.02
simazine	[122-34-9]	mg/kg	< 0.02	< 0.02	< 0.02
terbuthylazine	[5915-41-3]	mg/kg	< 0.02	< 0.02	< 0.02
terbutryn	[886-50-0]	mg/kg	< 0.02	< 0.02	< 0.02
ametryne	[834-12-8]	mg/kg	< 0.20	< 0.20	< 0.20
atraton	[1610-17-9]	mg/kg	< 0.10	< 0.10	< 0.10
prometon	[1610-18-0]	mg/kg	< 0.10	< 0.10	< 0.10
simetryn	[1014-70-6]	mg/kg	< 0.10	< 0.10	< 0.10

Marco Lattughi Senior Operations Manager



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Analytical Report

Envirolab Limited 7 & 8 Sandpits Business Park

Mottram Road

Hyde

Cheshire, SK14 3AR

Report No:

12-28618/1

Date Received:

05/09/2012

Date Tested:

06/09/2012 to 12/09/2012

Date Issued:

12/09/2012

Page:

1 of 1

For the attention of: lain Haslock

By email

3 soil samples received from Envirolab Limited (O/N: 727889; Project: 12/03975) in 100ml amber glass jars were analysed as shown below. Analytical methods employed are available on request. Results are reported on an as received basis unless otherwise specified.

Laboratory	/ reference		213236 12/03975/12 TP14 0.1-0.2m	213237 12/03975/16 TP37 0.1-0.2m	213238 12/03975/23 TP3 0.2m 28/08
cyfluthrin	[68359-37-5]	mg/kg	< 0.10	< 0.10	< 0.10
cyhalothrin	[91465-08-6]	mg/kg	< 0.10	< 0.10	< 0.10
cypermethrin	[52315-07-8]	mg/kg	< 0.10	< 0.10	< 0.10
deltamethrin	[52918-63-5]	mg/kg	< 0.10	< 0.10	< 0.10
fenvalerate	[51630-58-1]	mg/kg	< 0.10	< 0.10	< 0.10
permethrin	[52645-53-1]	mg/kg	< 0.10	< 0.10	< 0.10
atrazine	[1912-24-9]	mg/kg	< 0.02	< 0.02	< 0.02
cyanazine	[21725-46-2]	mg/kg	< 0.02	< 0.02	< 0.02
prometryn	[7287-19-6]	mg/kg	< 0.02	< 0.02	< 0.02
propazine	[139-40-2]	mg/kg	< 0.02	< 0.02	< 0.02
simazine	[122-34-9]	mg/kg	< 0.02	< 0.02	< 0.02
terbuthylazine	[5915-41-3]	mg/kg	< 0.02	< 0.02	< 0.02
terbutryn	[886-50-0]	mg/kg	< 0.02	< 0.02	< 0.02
ametryne	[834-12-8]	mg/kg	< 0.20	< 0.20	< 0.20
atraton	[1610-17-9]	mg/kg	< 0.10	< 0.10	< 0.10
prometon	[1610-18-0]	mg/kg	< 0.10	< 0.10	< 0.10
simetryn	[1014-70-6]	mg/kg	< 0.10	< 0.10	< 0.10

Marco Lattughi Senior Operations Manager



COMBINED FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 12/03975, 12/04076, 12/04180

Date: 22 October, 2012 **Issue Number:**

Client: **RSK Environment Ltd Hemel**

> 18 Frogmore Road Hemel Hempstead

Hertfordshire

IJK

HP3 9RT

Project Manager: Nigel Austin / Ben Coulston

Project Name: NIAB Phase 1

Project Ref: 25459

Order No: Not specified **Date Samples Received:** 03/09/12 **Date Instructions Received:** 04/09/12 **Date Analysis Completed:** 17/09/12

Prepared by: Approved by:

Melanie Marshall iain Hasiock

Laboratory Coordinator Analytical Consultant

Notes - Soil analysis

All results are reported as dry weight (<40 $^{\circ}$ C).

For samples with Matrix Codes 1 - 6 inert stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis. For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Subscript "A" indicates analysis performed on the sample as received, "D" indicates analysis performed on dried & crushed sample.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts. Superscript "M" indicates method accredited to MCERTS. Results in italics are associated with a control limit flag.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling.

Predominant Matrix Codes - 1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER.

Samples with Matrix Code 7 are not predominantly a SAND/LOA mix and are not covered by our MCERTS accreditation.

Secondary Matrix Codes - A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis. NDP indicates No Determination Possible. NAD indicates No Asbestos Detected.

Superscript # indicates method accredited to ISO 17025.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.





						r roject ner			
Lab Sample ID	12/03975/17	12/03975/18	12/03975/19	12/03975/20	12/04076/1	12/04076/2	12/04076/3		
Client Sample No									
Client Sample ID	TPD	TPI	TPL	TPO	WSB	WSE	WSH		
Depth to Top	0.10	0.20	0.30	0.30	0.10	0.10	0.20		
Depth To Bottom	0.20				0.20	0.20	0.30		
Date Sampled	30-Aug-12	28-Aug-12	29-Aug-12	28-Aug-12	06-Sep-12	06-Sep-12	06-Sep-12		eĮ
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil	Soil	Soil	s	Method ref
Sample Matrix Code	6AE	6AE	6AE	6A	5AE	6AE	5AE	Units	Meth
Asbestos in soil _A #	-	-	NAD	-	NAD	NAD	-		A-T-045
pH _D ^{M#}					6.92	-	7.34	pН	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}					0.10	-	<0.01	g/l	A-T-026s
Organic matter _D M#	-	-	-	-	2.0	-	-	% w/w	A-T-032 OM
Arsenic _D ^{M#}	8	8	8	7	9	7	12	mg/kg	A-T-024
Cadmium _D ^{M#}	<0.5	1.5	0.6	<0.5	0.6	0.6	0.7	mg/kg	A-T-024
Copper _D ^{M#}	18	20	24	20	21	17	20	mg/kg	A-T-024
Chromium _D #	24	29	31	29	26	37	25	mg/kg	A-T-024
Lead _D ^{M#}	40	46	44	59	52	46	52	mg/kg	A-T-024
Mercury _D	0.25	0.27	0.36	0.51	0.19	0.26	<0.17	mg/kg	A-T-024
Nickel _D ^{M#}	22	26	29	24	20	28	24	mg/kg	A-T-024
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1	<1	mg/kg	A-T-024
Zinc _D ^{M#}	49	59	214	62	64	60	55	mg/kg	A-T-024



Lab Sample ID	12/04180/20	12/04180/21	12/04180/22	12/04180/23				
Client Sample No								
Client Sample ID	WSM	внк	BHG	WSM				
Depth to Top	0.10	0.00	0.00	0.30				
Depth To Bottom		0.50	0.50	0.40				
Date Sampled	06-Sep-12	28-Aug-12	28-Aug-12	06-Sep-12				eŧ
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES			6 0	Method ref
Sample Matrix Code	6ABE	6AE	4AE	4ABE			Units	Meth
Asbestos in soil _A #	NAD	-	-	-				A-T-045
Organic matter _D ^{M#}	-	-	-	0.9			% w/w	A-T-032 OM
Arsenic _D ^{M#}	11	7	9	9			mg/kg	A-T-024
Cadmium _D ^{M#}	1.6	1.7	1.5	1.7			mg/kg	A-T-024
Copper _D ^{M#}	23	20	18	14			mg/kg	A-T-024
Chromium _D #	26	28	24	26			mg/kg	A-T-024
Lead _D ^{M#}	42	32	42	18			mg/kg	A-T-024
Mercury _D	<0.17	0.25	<0.17	<0.17			mg/kg	A-T-024
Nickel _D ^{M#}	24	25	23	24			mg/kg	A-T-024
Selenium _D ^{M#}	<1	<1	<1	<1			mg/kg	A-T-024
Zinc _D ^{M#}	88	77	54	54			mg/kg	A-T-024



					Official	Project Rei	. 20400		
Lab Sample ID	12/03975/17	12/03975/18	12/03975/19	12/03975/20	12/04076/1	12/04076/2	12/04076/3		
Client Sample No									
Client Sample ID	TPD	TPI	TPL	TPO	WSB	WSE	WSH		
Depth to Top	0.10	0.20	0.30	0.30	0.10	0.10	0.20		
Depth To Bottom	0.20				0.20	0.20	0.30		
Date Sampled	30-Aug-12	28-Aug-12	29-Aug-12	28-Aug-12	06-Sep-12	06-Sep-12	06-Sep-12		
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES	Soil	Soil	Soil	,	Method ref
Sample Matrix Code	6AE	6AE	6AE	6A	5AE	6AE	5AE	Units	Meth
PAH 16									
Acenaphthene _A ^{M#}	<0.01	-	<0.01	<0.01	<0.01	<0.01	-	mg/kg	A-T-019s
Acenaphthylene _A #	<0.01	-	<0.01	<0.01	<0.01	<0.01	-	mg/kg	A-T-019s
Anthracene _A #	<0.01	-	<0.01	<0.01	<0.01	<0.01	-	mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.02	-	0.04	0.04	0.07	0.04	-	mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.02	-	0.06	0.03	0.07	0.07	-	mg/kg	A-T-019s
Benzo(b)fluoranthene _A	0.05	-	0.12	0.07	0.13	0.09	-	mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.01	-	0.07	0.03	0.06	0.04	-	mg/kg	A-T-019s
Benzo(k)fluoranthene _A	0.01	-	0.03	0.02	0.03	0.01	-	mg/kg	A-T-019s
Chrysene _A ^{M#}	0.03	-	0.07	0.07	0.08	0.05	-	mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	<0.01	-	<0.01	<0.01	0.02	0.01	-	mg/kg	A-T-019s
Fluoranthene _A ^{M#}	0.01	-	0.06	0.08	0.09	0.06	-	mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01	-	<0.01	<0.01	<0.01	<0.01	-	mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	0.01	-	0.02	<0.01	0.06	0.04	-	mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.01	-	<0.01	<0.01	<0.01	<0.01	-	mg/kg	A-T-019s
Phenanthrene _A ^{M#}	<0.01	-	<0.01	0.03	<0.01	<0.01	-	mg/kg	A-T-019s
Pyrene _A ^{M#}	0.02	-	0.06	0.07	0.08	0.05	-	mg/kg	A-T-019s
Total PAH _A	0.19	-	0.52	0.44	0.71	0.48	-	mg/kg	A-T-019s
Pyrethroids									
Cyfluthrin					-	<0.1	-	mg/kg	Subcon
Cyhalothrin					-	<0.1	-	mg/kg	Subcon
Cypermethrin					-	<0.1	-	mg/kg	Subcon
Deltamethrin					-	<0.1	-	mg/kg	Subcon
Fenvalerate					-	<0.1	-	mg/kg	Subcon
Permethrin					-	<0.1	-	mg/kg	Subcon
-									



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Lab Sample ID	12/04180/20	12/04180/21	12/04180/22	12/04180/23					
Client Sample No									
Client Sample ID	WSM	внк	BHG	WSM					
Depth to Top	0.10	0.00	0.00	0.30					
Depth To Bottom		0.50	0.50	0.40					
Date Sampled	06-Sep-12	28-Aug-12	28-Aug-12	06-Sep-12					j e
Sample Type	Soil - ES	Soil - ES	Soil - ES	Soil - ES					Method ref
Sample Matrix Code	6ABE	6AE	4AE	4ABE				Units	Meth
PAH 16									
Acenaphthene _A ^{M#}	<0.01	-	-	-				mg/kg	A-T-019s
Acenaphthylene _A #	<0.01	-	-	-				mg/kg	A-T-019s
Anthracene _A #	<0.01	-	-	-				mg/kg	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.04	-	-	-				mg/kg	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.06	-	-	-				mg/kg	A-T-019s
Benzo(b)fluoranthene _A	0.11	-	-	-				mg/kg	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.07	-	-	-				mg/kg	A-T-019s
Benzo(k)fluoranthene _A	0.02	-	-	-				mg/kg	A-T-019s
Chrysene _A ^{M#}	0.07	-	-	-				mg/kg	A-T-019s
Dibenzo(ah)anthracene _A	<0.01	-	-	-				mg/kg	A-T-019s
Fluoranthene _A ^{M#}	0.08	-	-	-				mg/kg	A-T-019s
Fluorene _A ^{M#}	<0.01	-	-	-				mg/kg	A-T-019s
Indeno(123-cd)pyrene _A #	0.03	-	-	-				mg/kg	A-T-019s
Naphthalene _A ^{M#}	<0.01	-	-	-				mg/kg	A-T-019s
Phenanthrene _A ^{M#}	0.03	-	-	-				mg/kg	A-T-019s
Pyrene _A ^{M#}	0.09	-	-	-				mg/kg	A-T-019s
Total PAH _A	0.61	-	-	-				mg/kg	A-T-019s



					i roject nei			
Lab Sample ID	12/04076/1	12/04076/2	12/04076/3					
Client Sample No								
Client Sample ID	WSB	WSE	WSH					
Depth to Top	0.10	0.10	0.20					
Depth To Bottom	0.20	0.20	0.30					
Date Sampled	06-Sep-12	06-Sep-12	06-Sep-12					-
Sample Type	Soil	Soil	Soil				"	Method ref
Sample Matrix Code	5AE	6AE	5AE				Units	Meth
Triazines (x11)								
Ametryn	-	<0.2	-				mg/kg	Subcon
Atraton	-	<0.1	-				mg/kg	Subcon
Atrazine	-	<0.02	-				mg/kg	Subcon
Cyanazine	-	<0.02	-				mg/kg	Subcon
Prometon	-	<0.1	-				mg/kg	Subcon
Prometryn	-	<0.02	-				mg/kg	Subcon
Propazine	-	<0.02	-				mg/kg	Subcon
Simazine	-	<0.02	-				mg/kg	Subcon
Simetryn	-	<0.1	-				mg/kg	Subcon
Terbuthylazine	-	<0.02	-				mg/kg	Subcon
Terbutryn	-	<0.02	-				mg/kg	Subcon



					Project Rei			
Lab Sample ID	12/04076/1	12/04076/2	12/04076/3					
Client Sample No								
Client Sample ID	WSB	WSE	WSH					
Depth to Top	0.10	0.10	0.20					
Depth To Bottom	0.20	0.20	0.30					
Date Sampled	06-Sep-12	06-Sep-12	06-Sep-12					ef
Sample Type	Soil	Soil	Soil				0	Method ref
Sample Matrix Code	5AE	6AE	5AE				Units	Meth
Pest-c								
Mevinphos	-	<50	-				μg/kg	Subcon
Dichlorvos	-	<50	-				μg/kg	Subcon
alpha-Hexachlorocyclohexane (HCH)	-	<50	-				μg/kg	Subcon
Diazinon	-	<50	-				μg/kg	Subcon
gamma-Hexachlorocyclohexane (HCH / Lindane)	-	<50	-				μg/kg	Subcon
Heptachlor	-	<50	-				μg/kg	Subcon
Aldrin	-	<50	-				μg/kg	Subcon
beta-Hexachlorocyclohexane (HCH)	-	<50	-				μg/kg	Subcon
Methyl Parathion	•	<50	•				μg/kg	Subcon
Malathion	•	<50	•				μg/kg	Subcon
Fenitrothion	-	<50	-				μg/kg	Subcon
Heptachlor Epoxide	-	<50	-				μg/kg	Subcon
Parathion	-	<50	-				μg/kg	Subcon
p,p-DDE	-	<50	-				μg/kg	Subcon
p,p-DDT	-	<50	-				μg/kg	Subcon
p,p-Methoxychlor	-	<50	-				μg/kg	Subcon
p,p-TDE (DDD)	-	<50	-				μg/kg	Subcon
o,p-DDE	-	<50	-				μg/kg	Subcon
o,p-DDT	-	<50	-				μg/kg	Subcon
o,p-Methoxychlor	•	<50	•				μg/kg	Subcon
o,p-TDE (DDD)	•	<50	•				μg/kg	Subcon
Endosulphan I	•	<50	•				μg/kg	Subcon
Endosulphan II	-	<50	-				μg/kg	Subcon
Endosulphan Sulphate	-	<50	-				μg/kg	Subcon
Endrin	-	<50	-				μg/kg	Subcon
Ethion	-	<50	-				μg/kg	Subcon
Dieldrin	-	<50	-				μg/kg	Subcon
Azinphos-methyl	-	<50	-				μg/kg	Subcon



APPENDIX K HUMAN HEALTH GENERIC ASSESSMENT CRITERIA



10

K1 – RESIDENTIAL END-USE



Generic assessment criteria for human health: residential scenario – private gardens

The human health generic assessment criteria (GAC) have been developed during a period of regulatory review and updating of the Contaminated Land Exposure Assessment (CLEA) project. Therefore, the Environment Agency (EA) is in the process of publishing updated reports relating to the CLEA project and the GAC presented in this document may change to reflect these updates. This issue was prepared following the publication of soil guideline value (SGV) reports and associated publications⁽¹⁾ for mercury, selenium, benzene, toluene, ethylbenzene and xylene in March 2009, arsenic and nickel in May 2009, cadmium and phenol in June 2009, dioxins, furans and dioxin-like polychlorinated biphenyls (PCBs) in September 2009. It was also produced following publication of GAC by LQM⁽⁶⁾. Where available, the published soil guideline values (SGV)⁽¹⁾ were used as the GAC. The GAC for lead is discussed separately below owing to it not being derived using the same approach as other compounds.

Lead GAC derivation

The Environment Agency SGV and Tox reports for lead were withdrawn in 2009. In addition, the provisional tolerable weekly intake data published in the Netherlands were withdrawn in 2010 owing to concerns that they were not suitably protective of human health. The withdrawn SGVs were based on a target blood lead concentration of 10µg/dl. In the absence of current guidelines many consultants continue to use the withdrawn SGV. However, as this is not considered sufficiently protective of human health, after attendance at the SOBRA summer workshop June 2011, RSK has revised its GAC and is currently undertaking a review of recent toxicological developments that will be used to refine this GAC further in the coming months. In the meantime, RSK has undertaken sensitivity analysis using the Society of Environmental Geochemistry and Health (SEGH) equation and the CLEA model to produce an interim GAC value. The results are summarised below:

- Using CLEA with the former provisional tolerable weekly intake (PTWI) (25 μg/kg bw), assuming 100% lead is bioavailable, produces a GAC of 212 mg/kg
- Using CLEA with the former PTWI, assuming 50% lead is bioavailable, produces a GAC of 478 mg/kg
- Using the SEGH equation amended for a blood target concentration of 5.6 μg/dl (equal to the LOAEL for IQ defects) gives a negative GAC number unless other factors such as child background blood concentration or delta are amended. Without undertaking further research into these numbers, RSK can present sensitivity analysis to demonstrate the sensitivity of these input parameters but cannot justify one parameter over another. The results are:
 - OGAC between 39mg/kg and 99mg/kg if the value of delta (the slope or response of blood Pb versus soil and dust Pb relationship) only is amended from 5 to 2μg/dl/1000μg/g. The value of 2 was chosen as it is within the reasonable range quoted in the former SGV report
 - GAC between 244mg/kg and 610mg/kg if the geometric mean of blood lead concentration in young children is reduced from 3.4μg/dl to 2μg/dl. This decrease has been simulated on the basis that blood concentrations are likely to decrease over time across the UK owing to a ban on lead in petrol, lead within paint used internally and water pipe replacement. This decrease is considered reasonable as the site is a new development



so lead-based paints will not be used internally and lead water supply pipelines will be absent.

Therefore, given the results above RSK proposes to use a GAC of **300mg/kg** for a residential end use. This value is broadly in the middle of the range of sensitivity modelling results quoted above when background mean blood lead concentrations in children are reduced to reflect a new development. The value is also broadly in the middle of the range of sensitivity modelling results for a range of bioavailability of lead between 50% and 100%. This number is considered reasonably protective of human health while being practical for use.

GAC derivation for other metals and organic compounds

Model selection

Soil assessment criteria (SAC) were calculated using CLEA v1.06 and the supporting UK guidance⁽¹⁻⁶⁾. Groundwater assessment criteria (GrAC) protective of human health via the inhalation pathway were derived using the RBCA 1.3b model. RSK has updated the inputs within RBCA to reflect the UK guidance⁽¹⁻⁵⁾. The SAC and GrAC collectively are termed GAC.

Conceptual model

In accordance with EA Science Report SC050221/SR3⁽³⁾, the residential with private garden scenario considers risks to a female child between the ages of 0 and 6 years old. In accordance with Box 3.1, SR3⁽³⁾, the pathways considered for production of the SAC in the residential with gardens scenario are:

- · direct soil and dust ingestion;
- consumption of home-grown produce;
- consumption of soil attached to home-grown produce;
- · dermal contact with soil and indoor dust, and
- inhalation of indoor and outdoor dust and vapours.

Figure 1 is a conceptual model illustrating these linkages.

The pathway considered in production of the GrAC is the volatilisation of compounds from groundwater and subsequent vapour inhalation by residents while indoors. Figure 2 illustrates this linkage. Although the outdoor air inhalation pathway is also valid, this contributes little to the overall risks owing to the dilution in outdoor air. Within RBCA, the solubility limit of the determinant restricts the extent of volatilisation, which in turn drives the indoor air inhalation pathway. While the same restriction is not built into the CLEA model, the CLEA model output cells are flagged red where the soil saturation limit has been exceeded.

An assumption used in the CLEA model is that of simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase⁽⁴⁾. The upper boundaries of this partitioning are represented by the aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous-based or the vapour based



saturation limits. Where model output cells are flagged red the soil or vapour saturation limit has been exceeded and further consideration of the SAC to be used within the assessment is required. One approach that could be adopted is to use the 'modelled' solubility saturation limit or vapour saturation limit of the compound as the SAC. However, as stated within the CLEA handbook⁽⁴⁾ this is likely to not be practical in many cases because of the very low limits and, in any case, is highly conservative. Unless free-phase product is present, concentrations of the chemical are unlikely to be present at sufficient concentration to result in an exceedance of the health criteria value (HCV).

RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/CIEH⁽⁶⁾ whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limit given in brackets. Therefore, when using the SAC to screen laboratory analysis the assessor should take note if a given SAC has a corresponding solubility or vapour saturation limit (in brackets), and subsequently incorporate this piece of information within the screening analytical discussion. If further assessment is required following this process then an additional approach can be utilised as detailed within Section 4.12 of the CLEA model handbook⁽⁴⁾, which explains how to calculate an effective assessment criterion manually.

Input selection

Chemical data was obtained from EA Report SC050021/SR7⁽⁵⁾ and the health criteria values (HCV) from the UK TOX⁽¹⁾ reports where available. For SAC for total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH), toxicological and chemical specific parameters were obtained from the LQM/CIEH report⁽⁶⁾. Similarly, toxicological and specific chemical parameters for the volatile organic compound 1,2,4-trimethylbenzene were obtained from EIC/AGS/CL:AIRE⁽⁷⁾.

For total petroleum hydrocarbons (TPH), aromatic hydrocarbons C_5 - C_8 were not modelled since benzene and toluene are being modelled separately. The aromatic C_8 - C_9 hydrocarbon fraction comprises ethylbenzene, xylene and styrene. Since ethylbenzene and xylene are being modelled separately, the physical, chemical and toxicological data for this band has been taken from styrene.

Owing to the lack of UK-specific data, default information in the RBCA model was used to evaluate methyl tertiary butyl ether (MTBE). No published UK data was available for 1,3,5-trimethylbenzene, so information was obtained from the US EPA as in the RBCA model. RBCA uses toxicity data for the inhalation pathway in different units to the CLEA model and cannot consider separately the mean daily intake (MDI), occupancy periods or breathing rates. Therefore, the HCV in RBCA was amended to take account of:

- amendments to the MDI using Table 3.4 of SR2⁽²⁾
- a child weighing 13.3kg (average of 0–6 year old female in accordance with Table 4.6 of SR3⁽³⁾) and breathing 11.85m³ (average daily inhalation rate for a 0–6-year old female in accordance with Table 4.14 of SR3⁽³⁾



1. The 50% rule (for petroleum hydrocarbons, trimethylbenzenes and MTBE)⁽²⁾ where MDI data is not available but background exposure is considered important in the overall exposure.

Physical parameters

For the residential with private gardens scenario, the CLEA default building is a small two-storey terrace house with concrete ground-bearing slab. The house is assumed to have a 100m^2 private garden consisting of lawn, flowerbeds and incorporating a 20m^2 plot for growing fruit and vegetables consumed by the residents. SR3⁽³⁾ notes this residential building type to be the most conservative in terms of protection from vapour intrusion. The building parameters are outlined in Table 5.

The parameters for a sandy loam soil type were used in line with SR3⁽³⁾. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for this parameter, RSK has produced an additional set of SAC for an SOM of 1% and 2.5%. For the GrAC, the depth to groundwater was taken as 2.5m based on RSK's experience of assessing the volatilisation pathway from groundwater.

GAC

The SAC were produced using the input parameters in Tables 1 to 5 and the GrAC using input parameters in Table 6. The final selected GAC are presented by pathway in Table 7 and the combined GAC in Table 8.



Figure 1: Conceptual model for CLEA residential scenario – private gardens

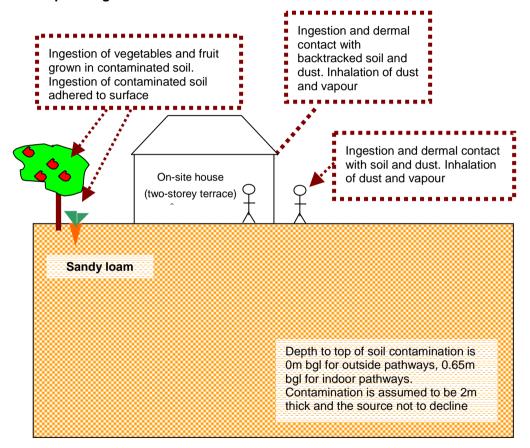


Table 1: Exposure assessment parameters for residential scenario - private gardens – inputs for CLEA model

	W.I	1 (10)
Parameter	Value	Justification
Land use	Residential with homegrown produce	Chosen land use
Receptor	Female child age 1 to 6	Key generic assumption given in Box 3.1, report SC050021/SR3 ⁽³⁾
Building	Small terraced house	Key generic assumption given in Box 3.1, report SC050021/SR3. Two storey small terraced house chosen as it is the most conservative residential building type in terms of protection from vapor intrusion (Section 3.4.6, report SC050021/SR3) ⁽³⁾
Soil type	Sandy Loam	Most common UK soil type (Section 4.3.1, From Table 3.1, report SC050021/SR3) ⁽³⁾
Start AC (age class)	1	Range of age classes corresponding to key generic assumption that the
End AC (age class)	6	critical receptor is a young female child aged zero to six. From Box 3.1, report SC050021/SR3 ⁽³⁾
SOM (%)	6	Representative of sandy loamy soil according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents' (8)
	1	To provide SAC for sites where
	2.5	SOM <6% as often observed by RSK
pН	7	Model default



Table 2: Residential with private gardens -home-grown produce data for CLEA model

	Consumption rate (g FW kg ⁻¹ BW day ⁻¹) by age class						Dry weight conversion factor		Home-grown fraction (high end)		Preparation correction factor
Name	1	2	3	4	5		g DW g ⁻¹ FW	-	-	g g ⁻¹ DW	-
Green vegetables	7.12	6.85	6.85	6.85	3.74	3.74	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	10.69	3.30	3.30	3.30	1.77	1.77	0.103	0.06	0.4	1.00E-03	1.00E+00
Tuber vegetables	16.03	5.46	5.46	5.46	3.38	3.38	0.21	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	1.83	3.96	3.96	3.96	1.85	1.85	0.058	0.06	0.4	1.00E-03	6.00E-01
Shrub fruit	2.23	0.54	0.54	0.54	0.16	0.16	0.166	0.09	0.6	1.00E-03	6.00E-01
Tree fruit	3.82	11.96	11.96	11.96	4.26	4.26	0.157	0.04	0.27	1.00E-03	6.00E-01
Justification	Table	4.17, \$	SR3 ⁽³⁾				Table 6.3, SR3 ⁽³⁾	Table 4.19, SF	R3 ⁽³⁾	Table 6.3,	SR3 ⁽³⁾



Table 3: Residential with private gardens – land use data for CLEA model

		Age class									
Parameter	Unit	1	2	3	4	5	6				
EF (soil and dust ingestion)	day yr ⁻¹	180	365	365	365	365	365				
EF (consumption of home-grown produce)	day yr ⁻¹	180	365	365	365	365	365				
EF (skin contact, indoor)	day yr ⁻¹	180	365	365	365	365	365				
EF (skin contact, outdoor)	day yr ⁻¹	180	365	365	365	365	365				
EF (inhalation of dust and vapour, indoor)	day yr ⁻¹	365	365	365	365	365	365				
EF (inhalation of dust and vapour, outdoor)	day yr ⁻¹	365	365	365	365	365	365				
Justification		Table 3.1, SR3 ⁽³⁾									
Occupancy period (indoor)	hr day ⁻¹	23	23	23	23	19	19				
Occupancy period (outdoor)	hr day ⁻¹	1	1	1	1	1	1				
Justification		Table 3.2,	SR3 ⁽³⁾								
Soil to skin adherence factor (indoor)	mg cm ⁻² day ⁻¹	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02	6.00E-02				
Soil to skin adherence factor (outdoor)	mg cm ⁻² day ⁻¹	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	0E+00 1.00E+00				
Justification		Table 8.1, 9	SR3 ⁽³⁾								
Soil and dust ingestion rate	g day ⁻¹	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01				
Justification		Table 6.2,	SR3 ⁽³⁾								

Of note, for **cadmium**, the exposure assessment for a residential land use is based on estimates representative of lifetime exposure AC1-18. This is because the TDI_{oral} and TDI_{inh} – are based on considerations of the kidney burden accumulated over 50 years. It is therefore reasonable to consider exposure not only in childhood but averaged over a longer time period. See the Environment Agency Science report: SC05002 / TOX 3 $^{(1)}$ and Science Report SC050021/Cadmium SGV $^{(1)}$ for more information.



Table 4: Residential with private gardens – receptor data for CLEA model

Davamatar	I I in id	Age (Class		lugtification				
Parameter	Unit	1	2	3	4	5	6	Justification	
Body weight	kg	5.6	9.8	12.7	15.1	16.9	19.7	Table 4.6. CD2 ⁽³⁾	
Body height	m	0.7	0.8	0.9	0.9	1	1.1	Table 4.6, SR3 ⁽³⁾	
Inhalation rate	m³ day ⁻¹	8.5	13.3	12.7	12.2	12.2	12.2	Table 4.14, SR3 ⁽³⁾	
Max exposed skin fraction (indoor)	m² m-²	0.32	0.33	0.32	0.35	0.35	0.33		
Max exposed skin fraction (outdoor)	m ² m ⁻²	0.26	0.26	0.25	0.28	0.28	0.26	Table 4.8, SR3 ⁽³⁾	

See cadmium note as per Table 3 above.

Table 5: Residential with private gardens – soil and building inputs for CLEA model

Parameter	Unit	Value	Justification
Soil properties for sandy loam			
Porosity, total	cm ³ cm ⁻³	0.53	
Porosity, air filled	cm ³ cm ⁻³	0.20	
Porosity, water filled	cm ³ cm ⁻³	0.33	Default soil type is sandy loam, Section 4.3.1,
Residual soil water content	cm ³ cm ⁻³	0.12	SR3 ⁽³⁾
Saturated hydraulic conductivity	cm s ⁻¹	3.56E-03	Parameters for sandy loam from Table 4.4, SR3 ⁽³⁾
van Genuchten shape parameter (<i>m</i>)	-	3.20E-01	Sito Sito
Bulk density	g cm ⁻³	1.21	
Threshold value of wind speed at 10m	m s ⁻¹	7.20	Default value taken from Section 9.2.2, SR3 ⁽³⁾
Empirical function (F _x) for dust model	-	1.22	Value taken from Section 9.2.2, SR3 ⁽³⁾
Ambient soil temperature	К	283	Annual average soil temperature representative of UK surface soils. Section 4.3.1, SR3 ⁽³⁾
Air dispersion model			
Mean annual wind speed (10m)	m s ⁻¹	5.00	Default value taken from Section 9.2.2, SR3 ⁽³⁾
Air dispersion factor at height of 0.8m	g m ⁻² s ⁻¹ per kg m ⁻	2400	Values for a 0.01 ha site, appropriate to a residential land use in Newcastle (most representative city for UK). (from Table 9.1,
Air dispersion factor at height of 1.6m	g m ⁻² s ⁻¹ per kg m ⁻	0	SR3) ⁽³⁾ Assumed child of 6 is not tall enough to reach 1.6m
Fraction of site with hard or vegetative cover	m ² m ⁻²	0.75	Section 3.2.6, SR3 ⁽³⁾ based on residential land use



Parameter	Unit	Value	Justification
Building properties for small to	errace hous	e with ground	-bearing floor slab
Building footprint	m ²	28	
Living space air exchange rate	hr ⁻¹	0.50	From Table 3.3 and 4.21, SR3 ⁽³⁾
Living space height (above ground)	m	4.8	Trom rubic o.e and 1.21, erec
Living space height (below ground)	m	0.0	Assumed no basement
Pressure difference (soil to enclosed space)	Pa	3.1	(2)
Foundation thickness	m	0.15	From Table 3.3, SR3 ⁽³⁾
Floor crack area	cm ²	423	
Dust loading factor	μg m ⁻³	50	Default value for a residential site taken from Section 9.3, SR3 ⁽³⁾
Vapour model			
Default soil gas ingress rate	cm ³ s ⁻¹	25	Generic flow rate, Section 10.3, SR3 ⁽³⁾
Depth to top of source (beneath building)	cm	50	Section 3.2.6, SR3 ⁽³⁾ states source is 50cm below building or 65cm below ground surface
Depth to top of source (no building)	cm	0	Section 10.2, SR3 ⁽³⁾ assumes impact from 0m to 1m for outdoor inhalation pathway
Thickness of contaminant layer	cm	200	Model default for indoor air, Section 4.9, SR4 ⁽⁴⁾
Time average period for surface emissions	years	6	Time period of a 0 to 6 year old, Box 3.5, SR3 ⁽³⁾
User-defined effective air permeability	cm ²	3.05E-08	Calculated for sandy loam using equations in Appendix 1, SR3 ⁽³⁾



Figure 2: GrAC conceptual model for RBCA residential with private gardens scenario

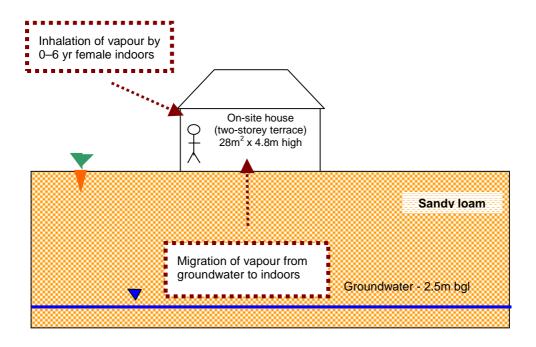


Table 6: Residential with private gardens - RBCA inputs

D		\ .	1 200						
Parameter	Unit	Value	Justification						
Receptor									
Averaging time	Years	6	From Box 3.1, SR3 ⁽³⁾						
Receptor weight	Receptor weight kg 13.3		Average of CLEA 0–6 year old female data, Table 4.6, SR3 ⁽³⁾						
Exposure duration	Years	6	From Box 3.1, report, SR3 ⁽³⁾						
Exposure frequency	Days/yr	350	Weighted using occupancy period of 23 hours per day for 365 days of the year						
Soil type – sandy loam	Soil type – sandy loam								
Total porosity	-	0.53							
Volumetric water content	-	0.33	CLEA value for sandy loam. Parameters for sandy loam						
Volumetric air content	-	0.20	from Table 4.4, SR3 ⁽³⁾						
Dry bulk density	g cm ⁻³	1.21							
Vertical hydraulic conductivity	cm s ⁻¹	3.56E-3	CLEA value for saturated conductivity of sandy loam, Table 4.4, SR3 ⁽³⁾						
Vapour permeability	Vapour permeability m ² 3.05E-12		Calculated for sandy loam using equations in Appendix 1, SR3 ⁽³⁾						
Capillary zone thickness	m	0.1	Professional judgement						



Parameter	Unit	Value	Justification			
Fraction organic carbon	%	(i) 0.0348	Representative of sandy loam according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents' (8)			
		(ii) 0.0058	To provide SAC for sites where SOM < 6% as often observed by RSK			
Building						
Building volume/area ratio	ng volume/area m 4.8		Table 3.3, SR3 ⁽³⁾			
Foundation area	m ²	28				
Foundation perimeter	m	22	Calculated assuming building measures 7m x 4m to give 28m² foundation area			
Building air exchange rate	d ⁻¹	12				
Depth to bottom of foundation slab	m	0.15	Table 3.3, SR3 ⁽³⁾			
Foundation thickness	m	0.15				
Foundation crack fraction	-	0.0151	Calculated from floor crack area of 423 cm ² and building footprint of 28m ² in Table 4.21, SR3 ⁽³⁾			
Volumetric water content of cracks	-	0.33	Assumed equal to underlying soil type in assumption that cracks become filled with soil over time. Parameters for			
Volumetric air content of cracks	-	0.2	sandy loam from Table 4.4, SR3 ⁽³⁾			
Indoor/outdoor differential pressure	Pa	3.1	From Table 3.3, SR3 ⁽³⁾			



References

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- 6. Chartered Institute for Environmental Health and Land Quality Management (2009), 'The LQM/CIEH Generic Assessment Criteria for Human Health', second edition.
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- 8. Changes made to the CLEA framework documents after the three-month evaluation period in 2008, released January 2009 by the Environment Agency.

Table 7

Human Health Generic Assessment Criteria by Pathway for Residential Scenario - Private Gardens



	Z		AC SAC Appropriate to Pathway SOM 1% (mg/kg)		Soil Saturation	SAC Appropriate to Pathway SOM 2.5% (mg/kg)		Soil Saturation	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation		
Compound	Notes	(mg/l)	Oral	Inhalation	Combined	Limit (mg/kg)	Oral	Inhalation	Combined	Limit (mg/kg)	Oral	Inhalation	Combined	Limit (mg/kg)
						((gg)
Wetals														
Arsenic	(b)(c)	-	3.24E+01	8.50E+01	-	NR	3.24E+01	8.50E+01	-	NR	3.24E+01	8.50E+01	-	NR
Cadmium	(b)	-	1.12E+01	1.85E+02	1.10E+01	NR	1.12E+01	1.85E+02	1.10E+01	NR	1.12E+01	1.85E+02	1.10E+01	NR
Chromium (III) - oxide		-	1.84E+04	3.55E+03	2.98E+03	NR	1.84E+04	3.55E+03	2.98E+03	NR	1.84E+04	3.55E+03	2.98E+03	NR
Chromium (VI) - hexavalent		-	1.02E+01	4.25E+00	3.21E+00	NR	1.02E+01	4.25E+00	3.21E+00	NR	1.02E+01	4.25E+00	3.21E+00	NR
Copper		-	2.66E+03	1.04E+04	2.33E+03	NR	2.66E+03	1.04E+04	2.33E+03	NR	2.66E+03	1.04E+04	2.33E+03	NR
_ead	(a)	-	3.00E+02	-	-	NR	3.00E+02	-	-	NR	3.00E+02	-	-	NR
Elemental Mercury (Hg ⁰)	(b)(d)	9.40E-03	-	1.70E-01	-	4.31E+00	-	4.24E-01	-	1.07E+01	-	1.02E+00	-	2.58E+01
norganic Mercury (Hg ²⁺)	(b)	-	1.81E+02	2.55E+03	1.69E+02	NR	1.81E+02	2.55E+03	1.69E+02	NR	1.81E+02	2.55E+03	1.69E+02	NR
Methyl Mercury (Hg ⁴⁺)	(b)	2.00E+01	1.39E+01	1.59E+01	7.40E+00	7.33E+01	1.39E+01	3.08E+01	9.55E+00	1.42E+02	1.39E+01	6.53E+01	1.14E+01	3.04E+02
Nickel	(b)(d)	-	5.31E+02	1.27E+02	-	NR	5.31E+02	1.27E+02	-	NR	5.31E+02	1.27E+02	-	NR
Selenium	(b)(c)	-	3.50E+02	-	-	NR	3.50E+02	NR	-	NR	3.50E+02	-	-	NR
Zinc	(c)	-	3.75E+03	2.55E+07	-	NR	3.75E+03	2.55E+07	-	NR	3.75E+03	2.55E+07	-	NR
Cyanide		-	2.66E+01	3.97E+00	3.68E+00	NR	2.66E+01	3.97E+00	3.68E+00	NR	2.66E+01	3.97E+00	3.68E+00	NR
/olatile Organic Compounds	, ,													
Benzene	(b)	7.20E+00	1.12E-01	2.69E-01	7.92E-02	1.22E+03	2.28E-01	4.99E-01	1.57E-01	2.26E+03	4.89E-01	1.04E+00	3.32E-01	4.71E+03
Toluene	(b)	1.90E+03	1.47E+02	6.26E+02	1.19E+02	8.69E+02	3.35E+02	1.38E+03	2.70E+02	1.92E+03	7.59E+02	3.14E+03	6.11E+02	4.36E+03
Ethylbenzene	(b)	2.60E+02	1.06E+02	1.70E+02	6.52E+01	5.18E+02	2.51E+02	3.98E+02	1.54E+02	1.22E+03	5.70E+02	9.32E+02	3.54E+02	2.84E+03
Kylene - m		8.40E+01	2.02E+02	5.56E+01	4.36E+01	6.25E+02	4.80E+02	1.31E+02	1.03E+02	1.47E+03	1.09E+03	3.07E+02	2.40E+02	3.46E+03
Kylene - o	(b)	1.00E+02	1.85E+02	5.98E+01	4.52E+01	4.78E+02	4.38E+02	1.40E+02	1.06E+02	1.12E+03	9.96E+02	3.27E+02	2.46E+02	2.62E+03
(ylene - p		8.70E+01	1.91E+02	5.34E+01	4.17E+01	5.76E+02	4.51E+02	1.26E+02	9.82E+01	1.35E+03	1.02E+03	2.94E+02	2.28E+02	3.17E+03
Total xylene		8.40E+01	2.02E+02	5.56E+01	4.36E+01	6.25E+02	4.80E+02	1.31E+02	1.03E+02	1.47E+03	1.09E+03	3.07E+02	2.40E+02	3.46E+03
Methyl t-Butyl ether		2.20E+03	1.75E+00	1.84E+02	1.75E+00	1.66E+04	3.68E+00	2.40E+02	3.67E+00	2.16E+04	7.41E+00	3.70E+02	7.37E+00	3.34E+04
Trichloroethene		1.80E+00	2.83E+00	1.10E-01	1.06E-01	1.54E+03	6.25E+00	2.30E-01	2.22E-01	3.22E+03	1.40E+01	5.11E-01	4.93E-01	7.14E+03
Tetrachloroethene		3.60E+00	1.06E+01	1.03E+00	9.36E-01	4.24E+02	2.44E+01	2.30E+00	2.10E+00	9.51E+02	5.55E+01	5.28E+00	4.82E+00	2.18E+03
1,1,1-Trichloroethane		2.60E+01	3.20E+02	6.33E+00	6.21E+00	1.43E+03	6.97E+02	1.29E+01	1.27E+01	2.92E+03	1.55E+03	2.84E+01	2.79E+01	6.39E+03
1,1,1,2 Tetrachloroethane		1.40E+01	5.19E+00	1.08E+00	8.93E-01	2.60E+03	1.22E+01	2.50E+00	2.08E+00	6.02E+03	2.78E+01	5.83E+00	4.82E+00	1.40E+04
1,1,2,2-Tetrachloroethane		1.40E+01	2.70E+00	2.76E+00	1.37E+00	2.67E+03	5.85E+00	5.65E+00	2.87E+00	5.46E+03	1.30E+01	1.24E+01	6.34E+00	1.20E+04
Carbon Tetrachloride		5.50E-02	1.05E+00	1.81E-02	1.79E-02	1.52E+03	2.41E+00	3.97E-02	3.93E-02	3.32E+03	5.44E+00	8.99E-02	8.92E-02	7.54E+03
1,2-Dichloroethane		3.00E-01	3.06E-02	6.46E-03	5.34E-03	3.41E+03	5.53E-02	9.32E-03	7.98E-03	4.91E+03	1.05E-01	1.60E-02	1.39E-02	8.43E+03
Vinyl Chloride		1.90E-02	3.69E-03	5.43E-04	4.73E-04	1.36E+03	6.64E-03	7.02E-04	6.35E-04	1.76E+03	1.21E-02	1.07E-03	9.86E-04	2.69E+03
1,2,4-Trimethylbenzene		7.50E-02	-	3.51E-01		5.57E+02	-	8.55E-01		1.36E+03		2.10E+00	· · · · ·	3.25E+03
1,3,5-Trimethylbenzene		4.70E-02	1.45E+01	4.60E-01	4.56E-01	9.47E+01	3.47E+01	1.10E+00	1.09E+00	2.26E+02	7.94E+01	2.59E+00	2.56E+00	5.33E+02
Semi-Volatile Organic Compounds Acenaphthene		3.20E+00	2.18E+02	3.46E+03	2.05E+02	5.70E+01	5.08E+02	8.54E+03	4.79E+02	1.41E+02	1.06E+03	2.03E+04	1.01E+03	3.36E+02
		4.20E+00	1.78E+02	3.46E+03 3.27E+03	1.68E+02	8.61E+01	4.17E+02	8.03E+03	3.97E+02	2.12E+02	8.90E+02	1.91E+04	8.51E+02	5.06E+02
Acenaphthylene Anthracene		4.20E+00 2.10E-02	1.78E+02 2.31E+03	3.27E+03 1.08E+05	1.68E+02 2.26E+03	8.61E+01 1.17E+00	4.17E+02 5.03E+03	8.03E+03 2.65E+05	3.97E+02 4.93E+03	2.12E+02 2.91E+00	9.33E+03	1.91E+04 6.15E+05	9.19E+03	5.06E+02 6.96E+00
Renzo(a)anthracene		2.10E-02 3.80E-03	7.00E+00	5.55E+00	3.10E+00	1.77E+00 1.71E+00	8.98E+00	9.83E+00	4.93E+03 4.69E+00	4.28E+00	1.01E+01	1.41E+01	5.88E+00	1.03E+01
Benzo(a)antinacene		2.00E-03	8.06E+00	1.79E+01	5.56E+00	1.71E+00 1.22E+00	9.78E+00	1.97E+01	6.53E+00	3.04E+00	1.07E+01	2.05E+01	7.02E+00	7.29E+00
Benzo(g,h,i)perylene		2.60E-04	6.68E+01	1.79E+01	4.38E+01	1.54E-02	7.04E+01	1.32E+02	4.59E+01	3.85E-02	7.19E+01	1.34E+02	4.68E+01	9.23E-02
Benzo(k)fluoranthene		8.00E-04	1.25E+01	2.66E+01	8.51E+00	6.87E-01	1.44E+01	2.83E+01	9.56E+00	1.72E+00	1.53E+01	2.91E+01	1.00E+01	4.12E+00
Chrysene		2.00E-03	8.76E+00	1.95E+01	6.00E+00	4.40E-01	1.20E+01	2.45E+01	8.04E+00	1.10E+00	1.41E+01	2.72E+01	9.27E+00	2.64E+00
Dibenzo(a,h)anthracene		6.00E-04	1.19E+00	2.13E+00	7.62E-01	3.93E-03	1.33E+00	2.42E+00	8.58E-01	9.82E-03	1.39E+00	2.56E+00	9.03E-01	2.36E-02
luoranthene		2,30E-01	2.59E+02	2.69E+04	2.57E+02	1.89E+01	4.67E+02	6.23E+04	4.63E+02	9.82E-03 4.73E+01	6.78E+02	1.28E+05	6.74E+02	1.13E+02
luorantnene		2.30E+01 1.90E+00	2.59E+02 1.70E+02	2.69E+04 4.35E+03	1.63E+02	1.89E+01 3.09E+01	4.67E+02 3.91E+02	6.23E+04 1.07E+04	4.63E+02 3.77E+02	4.73E+01 7.65E+01	6.78E+02 8.00E+02	1.28E+05 2.54E+04	7.76E+02	1.13E+02 1.83E+02
		1.80E+00 2.00E-04	1.70E+02 4.58E+00	4.35E+03 1.04E+01	1.63E+02 3.18E+00	6.13E-02	3.91E+02 5.74E+00	1.07E+04 1.17E+01	3.77E+02 3.85E+00	7.65E+01 1.53E-01	6.37E+00	1.22E+01	7.76E+02 4.19E+00	1.83E+02 3.68E-01
ndeno(1,2,3-cd)pyrene		2.00E-04 5.30E-01	4.58E+00 9.35E+01	1.04E+01 5.04E+03	9.18E+01	6.13E-02 3.60E+01	5.74E+00 2.04E+02	1.17E+01 1.23E+04	3.85E+00 2.01E+02		3.81E+02	1.22E+01 2.86E+04	4.19E+00 3.76E+02	3.68E-01 2.14E+02
Phenanthrene Pyrene		5.30E-01	5.69E+02	6.18E+04	9.18E+01 5.63E+02	2.20E+00	1.05E+03	1.23E+04 1.44E+05	2.01E+02 1.04E+03	8.96E+01 5.49E+00	3.81E+02 1.56E+03	2.86E+04 2.97E+05	3.76E+02 1.56E+03	2.14E+02 1.32E+01
		3.80E-03	1.21E+00	2.62E+00	8.26E-01	9.11E-01	1.05E+03 1.42E+00	1.44E+05 2.81E+00	9.43E-01		1.56E+03 1.52E+00	2.97E+05 2.90E+00	9.98E-01	1.32E+01 5.46E+00
Benzo(a)pyrene Naphthalene		3.80E+01	2.68E+01	1.64E+00	1.54E+00	9.11E-01 7.64E+01	6.36E+01	3.93E+00	3.70E+00	2.28E+00 1.83E+02	1.52E+00 1.43E+02	9.27E+00	9.98E-01 8.71E+00	5.46E+00 4.32E+02
vapriiriaieffe		CSUCHUT	2.00LT01	1.04E+00	1.54L+00	7.04E+UI	0.00E+01	3.33LT00	3.70L+00	1.03E+02	1.43E+02	9.27 = +00	8.7 IE+00	4.32E+02

Table 7

RSK GAC_2010_03_Rev04

GENERIC ASSESSMENT CRITERIA FOR HUMAN HEALTH - RESIDENTIAL WITH PRIVATE GARDENS

Table 7

Human Health Generic Assessment Criteria by Pathway for Residential Scenario - Private Gardens



	GrAC SAC Appropriate to Pathy			ate to Pathway So	OM 1% (mg/kg)	Soil Saturation	SAC Appropri	ate to Pathway SO	M 2.5% (mg/kg)	Soil Saturation	SAC Appropriate to Pathway SOM 6% (mg/kg)			Soil Saturation
Compound	tes	(mg/l)	Oral	Inhalation	Combined	Limit (mg/kg)	Oral	Inhalation	Combined	Limit (mg/kg)	Oral	Inhalation	Combined	Limit (mg/kg)
Total Petroleum Hydrocarbons														
Aliphatic hydrocarbons EC ₅ -EC ₆		1.00E+01	4.79E+03	2.98E+01	2.97E+01	3.04E+02	1.08E+04	5.47E+01	5.46E+01	5.58E+02	2.35E+04	1.13E+02	1.13E+02	1.15E+03
Aliphatic hydrocarbons >EC ₆ -EC ₈		5.40E+00	1.43E+04	7.27E+01	7.26E+01	1.44E+02	3.21E+04	1.62E+02	1.62E+02	3.22E+02	6.36E+04	3.72E+02	3.71E+02	7.36E+02
Aliphatic hydrocarbons >EC ₈ -EC ₁₀		2.30E-01	1.46E+03	1.89E+01	1.88E+01	7.77E+01	2.44E+03	4.60E+01	4.58E+01	1.90E+02	3.30E+03	1.09E+02	1.08E+02	4.51E+02
Aliphatic hydrocarbons >EC ₁₀ -EC ₁₂		3.40E-02	3.52E+03	9.34E+01	9.28E+01	4.75E+01	4.01E+03	2.32E+02	2.29E+02	1.18E+02	4.24E+03	5.57E+02	5.37E+02	2.83E+02
Aliphatic hydrocarbons >EC ₁₂ -EC ₁₆		7.60E-04	4.37E+03	7.82E+02	7.44E+02	2.37E+01	4.40E+03	1.95E+03	1.69E+03	5.91E+01	4.41E+03	4.68E+03	3.03E+03	1.42E+00
Aliphatic hydrocarbons >EC ₁₆ -EC ₃₅	(c)	-	4.51E+04	-	-	8.48E+00	6.38E+04	-	-	2.12E+01	7.61E+04	-	-	5.09E+01
Aliphatic hydrocarbons >EC ₃₅ -EC ₄₄	(c)	-	4.51E+04	-	-	8.48E+00	6.38E+04	-	-	2.12E+01	7.61E+04	-	-	5.09E+01
Aromatic hydrocarbons >EC ₈ -EC ₉ (styrene)		7.40E+00	1.66E+02	2.65E+02	1.33E+02	6.20E+02	3.92E+02	6.47E+02	3.16E+02	1.52E+03	8.50E+02	1.54E+03	7.02E+02	3.61E+03
Aromatic hydrocarbons >EC ₉ -EC ₁₀		7.40E+00	5.55E+01	3.33E+01	2.69E+01	6.13E+02	1.31E+02	8.16E+01	6.54E+01	1.50E+03	2.84E+02	1.94E+02	1.51E+02	3.58E+02
Aromatic hydrocarbons >EC ₁₀ -EC ₁₂		2.50E+01	7.97E+01	1.82E+02	6.91E+01	3.64E+02	1.86E+02	4.48E+02	1.62E+02	8.99E+02	3.87E+02	1.07E+03	3.46E+02	2.15E+03
Aromatic hydrocarbons >EC ₁₂ -EC ₁₆		5.80E+00	1.40E+02	2.00E+03	1.38E+02	1.69E+02	3.13E+02	4.96E+03	3.08E+02	4.19E+02	6.01E+02	1.18E+04	5.93E+02	1.00E+03
Aromatic hydrocarbons >EC ₁₆ -EC ₂₁	(c)	-	2.47E+02	-	-	5.37E+01	4.82E+02	-	-	1.34E+02	7.66E+02	-	-	3.21E+02
Aromatic hydrocarbons >EC ₂₁ -EC ₃₅	(c)	-	8.88E+02	-	-	4.83E+00	1.11E+03	-	-	1.21E+01	1.22E+03	-	-	2.90E+01
Aromatic hydrocarbons >EC ₃₅ -EC ₄₄	(c)	-	8.88E+02	-	-	4.83E+00	1.11E+03	-	-	1.21E+01	1.22E+03	-	-	2.90E+01

Notes:

-' Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.

NR - the compound is not volatile and therefore a soil saturation limit not calculated within CLEA

EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.

The CLEA model output is colour coded depending upon whether the soil saturation limit has been exceeded.



Calculated SAC exceeds soil saturation limit and may significantly effect the interpretation of any exceedances since the contribution of the indoor and outdoor vapour pathway to total exposure is

>10%. This shading has also been used for the RBCA output where the theoretical solubility limit has been exceeded. The SAC has been set as the model calculated SAC with the saturation limits shown in brackets.

Calculated SAC exceeds soil saturation limit but will not effect the SSV significantly since the contribution of the indoor and outdoor vapour pathway to total exposure is <10%.

Calculated SAC does not exceed the soil saturation limit.

For consistency where the theoretical solubility limit within RBCA has been exceeded in production of the GrAC, these cellls have also been hatched red.

The SAC for organic compounds are dependant upon soil organic matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994. SAC for TPH fractions, polycyclic aromatic hydrocarbons, MTBE, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3

(a) Sensitivity analysis undertaken on SEGH equation and CLEA model, considered reasonable in absence of UK specific data

- (b) GAC taken from the Environment Agency SGV reports published 2009.
- (c) SAC for selenium, aliphatic and aromatic hydrocarbons >EC16 does not include inhalation pathway owing to absence of toxicity data. SAC for arsenic is only based on oral contribution (rather than combined) owing to the relative small contribution from inhalation in accordance with the SGV report. The same approach has been adopted for zinc.
- (d) SAC for elemental mercury, chromium VI and nickel is based on the inhalation pathway only owing to an absence of toxicity for elemental mercury, in accordance with the SGV report for nickel and LQM report for chromium VI.

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Table 8 Human Health Generic Assessment Criteria for Residential Scenario - Private Gardens

Maraba	Compound	GrAC for Groundwater (mg/l)	SAC for Soil SOM 1% (mg/kg)	SAC for Soil SOM 2.5% (mg/kg)	SAC for Soil SOM 6% (mg/kg)
Casmium - 10 10 10 10 10 10 10	Metals				
Chemium (III) - oxobe					
Chromatin (10) - hearwidert . 4.3					
Copper					
See				·	
Elemental Mercury (Hg*)					
Incaganic Mercury (Hg*)		0.009			
Methy Merrary (Fig**)		•			
Selentum .	Methyl Mercury (Hg ⁴⁺)	20	7.4	9.6	11
27	Nickel		130	130	130
Cyanide . 3.7 3.7 3.7 Volatile Organic Compounds Semezone 7 0.079 0.157 0.33 Toluene 1,900 120 270 610					
Volatile Organic Compounds 8 Benzene 7 0.079 0.157 0.33 Toluene 1.900 120 270 610 Ethybenzene 280 65 154 350 Sylene - n 197 46 100 20 Xylene - p 84 42 98 220 Total vylene 84 42 98 220 Total vylene 84 44 103 240 Methy teriary buyl ether (MTBE) 2,200 1.8 3.7 7.4 Total vylene 1.8 0.11 0.2 0.49 Total vylene 1.8 0.11 0.2 0.49 Total vylene 8.4 44 103 220 William (Marchaell Controllation) 1.8 0.11 0.2 0.49 Total vylene 3.6 0.94 2.1 4.8 1.1,1.2 Faterachioreshane 1.6 6.2 12.7 2.8 1.1,1.2 Faterachioreshane 1.4 0.89					
Senzane 7	Cyanide	-	3.7	3.7	3.7
Tolusene					
Ethybenzene					
Xylene - m 100					
Xylene - 0					
Xylene - p					
Total xylene Methyl tertiary butyl ether (MTBE)					
Trichloroethene 1.8 0.11 0.2 0.49 Tetrachloroethene 3.6 0.94 2.1 4.8 1,1,1-Tricholroethane 26 6.2 12.7 2.8 1,1,1,2Tetrachloroethane 14 0.89 2.1 4.8 1,1,2Fetrachloride 0.055 0.018 0.039 0.069 1,2-Dichloroethane 0.30 0.0053 0.0090 0.014 Viryl Chloride 0.019 0.00047 0.0006 0.001 1,2-Brimethylbenzene 0.075 0.35 0.85 2.1 1,3-Ermethylbenzene 0.047 0.46 1.1 2.6 Semi-Volatile Organic Compounds 2.2 210 480 1,000 Acenaphthylene 4.2 170 400 850 Anthracene 0.021 2,300 4,900 9,200 Benzo(ghliburanthene 0.0020 5.6 6.5 7.0 Benzo(ghliburanthene 0.00020 5.6 6.5 7.0 Benzo(ghlin	Total xylene				
Tetrachiorcethene 3.6 0.94 2.1 4.8 1.1.12Fretachiorcethane 26 6.2 12.7 28 1.1.12Fetrachiorcethane 14 0.88 2.1 4.8 1.1.22Fetrachiorcethane 14 1.4 2.87 6.3 Carbon Tetrachioride 0.055 0.018 0.039 0.089 1.2-Dichloredhane 0.30 0.0053 0.0080 0.014 Vi.V.2-Chrimethylenzene 0.007 0.0053 0.0080 0.001 Vi.V.2-Chrimethylenzene 0.047 0.46 1.1 2.6 Semi-Volatile Organic Compounds 3.2 210 480 1.000 Acenaphthene 3.2 2.2 1.0 480 1.000 Acenaphthene 4.2 1.70 4.0 850 Bertzolgianthylareae 4.22 1.70 4.0 8.50 Bertzolgianthylareae 0.0038 3.1 4.7 5.9 Bertzolgianthylareae 0.0039 3.1 4.7 5.9					
1,1-1Frichloroethane					
1.1.12Fetrachloroethane					
1.1,22-Tetrachloroethane					
Carbon Tetrachloride 0.055 0.018 0.039 0.089 1, 2-Dichlorosthane 0.30 0.0053 0.0080 0.014 Vinvi Chloride 0.019 0.00047 0.0006 0.001 1,2,4-Trimethybenzene 0.047 0.46 1.1 2.6 Semi-Volatile Organic Compounds Acenaphthene 3.2 210 480 1.000 Acenaphthylene 4.2 170 400 850 Anthracene 0.021 2,300 4,900 9,200 Benzo(ghliburanthene 0.0038 3.1 4.7 5.9 Benzo(ghliburanthene 0.00020 5.6 6.5 7.0 Benzo(ghliburanthene 0.00020 44 4.6 4.7 Benzo(ghliburanthene 0.00020 5.6 6.5 7.0 Benzo(ghliburanthene 0.00020 6.0 8.5 9.6 10 Chrysene 0.00020 6.0 8.0 9.3 10 Diberzo(a)Ibunthracene					
1.2-Dichloroethane					
Vinyl Chloride 0.019 0.00047 0.0006 0.001 1,2.4-Trimethylbenzene 0.075 0.35 0.85 2.1 1,3.5-Trimethylbenzene 0.047 0.46 1.1 2.6 Semi-Volatile Organic Compounds Semi-Volatile Organic Compounds Acenaphtylene 4.2 210 480 1,000 Acenaphtylene 4.2 170 400 850 Anthracene 0.021 2,300 4,900 9,200 Benzo(phlluoranthene 0.0038 3.1 4.7 5.9 Benzo(phlluoranthene 0.0020 5.6 6.5 7.0 Benzo(phlluoranthene 0.0020 6.6 6.5 7.0 Benzo(phlyluoranthene 0.00000 8.5 9.6 10 47 Benzo(phlyluoranthene 0.00000 8.5 9.6 10 0.0 9.3 Dibernzo(a,h)anthracene 0.00000 0.76 0.86 0.90 0.0 1.0 0.0 1.0 0.					
1,2,4-Trimethylbenzene					
Semi-Volatile Organic Compounds					
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Aromatic hydrocarbons >EC $_{21}$ -EC $_{35}$ - 890 1,100 1,230	Aromatic hydrocarbons >EC ₁₆ -EC ₂₁	-	250	480	770
		-			
	Aromatic hydrocarbons >EC ₃₅ -EC ₄₄		890	1,100	1,230

Notes

'-' Generic assessment criteria not calculated owing to low volatility of substance and therefore no pathway, or an absence of toxicological data.

EC - equivalent carbon. GrAC - groundwater assessment criteria. SAC - soil assessment criteria.

The SAC for organic compounds are dependent on Soil Organic Matter (SOM) (%) content. To obtain SOM from total organic carbon (TOC) (%) divide by 0.58. 1% SOM is 0.58% TOC. DL Rowell Soil Science: Methods and Applications, Longmans, 1994.

SAC for TPH fractions, polycyclic aromatic hydrocarbons, MTBE, BTEX and trimethylbenzene compounds were produced using an attenuation factor for the indoor air inhalation pathway of 10 to reduce conservatism associated with the vapour inhalation pathway, section 10.1.1, SR3.

The SAC has been set as the model calculated SAC with the saturation limit shown in brackets. For consistency where the GrAC exceeds the solubility limit, GrAC has been set at the solubility limit. The GrAC conservative since concentrations of the chemical are very unlikely to be at sufficient concentration to result in an exceedance of the health criteria value at the point of exposure (i.e. indoor air) provided free-phase product is absent.

Table 8 RSK GAC_2010_03_Rev04



K2 – COMMERCIAL END-USE



Generic assessment criteria for human health: commercial scenario

The human health generic assessment criteria (GAC) have been developed during a period of regulatory review and updating of the Contaminated Land Exposure Assessment (CLEA) project. Therefore, the Environment Agency (EA) is in the process of publishing updated reports relating to the CLEA project and the GAC presented in this document may change to reflect these updates. This issue was prepared following the publication of soil guideline value (SGV) reports and associated publications⁽¹⁾ for mercury, selenium, benzene, toluene, ethylbenzene and xylene in March 2009, arsenic and nickel in May 2009, cadmium and phenol in June 2009, dioxins, furans and dioxin-like polychlorinated biphenyls (PCBs) in September 2009. It was also produced following publication of GAC by LQM⁽⁶⁾. Where available, the published soil guideline values (SGV)⁽¹⁾ were used as the GAC. The GAC for lead is discussed separately below owing to it not being derived using the same approach as other compounds.

Lead GAC derivation

The Environment Agency SGV and Tox reports for lead were withdrawn in 2009. In addition, the provisional tolerable weekly intake data published in the Netherlands was also withdrawn in 2010 owing to concerns that it was not suitably protective of human health. The withdrawn SGV was based on a target blood lead concentration 10 μ g/dl. In the absence of current guidelines, many consultants have continued to use the withdrawn SGV. However, as this is not considered sufficiently protective of human health RSK has revised its GAC for lead and is currently undertaking a review of recent toxicological developments that will be used to refine this GAC further in the coming months.

Variable	Description of variable	Units	Value in SGV10	Revised value for RSK GAC
Т	Health criteria value – reduced owing to concern that 10ug/dl may not be suitably protective of human health	ug/dl	10	5
G	Geometric standard deviation for B typically in range of 1.8 to 2.1	-	2.0	1.8
В	Geometric mean of blood lead concentration in adult women. The value used in SGV10 was based on UK data from 1995 from women in an urban area aged 16–44. Data in the US has shown decreases from between 1.7 and 2.2 to 1ug/dl between the late 1980s/early 1990s and late 1990s/early 2000s for adult females between 17 and 45 years old. Lead concentrations in blood are likely to be decreasing in the UK owing to a ban on lead in internal paint, a ban on lead in fuel and replacement of lead pipes for water supply	ug/dl	2.3	1.0
n	Selected on the basis of the degree of protection needed for a population at risk at the target concentration (T); the default value is 95%	-	1.645	1.645
AT _{S, D}	Averaging time assuming exposure over working lifetime. The value has been revised to reflect 49 years in accordance with CLEA commercial scenario outlined in SR3	days	15695	17885
BKSF	Biokinetic slope factor	ug/dl per ug/day	0.4	0.4
IRs	Soil ingestion rate (including soil-derived indoor dust). This value has been revised to reflect the CLEA commercial scenario outlined in SR3	g/day	0.040	0.050
AF _{S, D}	Absorption fraction (same for soil and dust)	-	0.12	0.12
EF _{S, D}	Exposure frequency – based on CLEA commercial conceptual model	days/yr	230	230
ED	Exposure duration. This value has been revised to reflect CLEA commercial conceptual model outlined in SR3	years	43	49



The methodology utilised for the adult receptor is the Adult Lead Methodology used in the USA, which is a similar equation to that used in production of the UK SGV outlined in R&D publication SGV10. Parameters within the equation are presented below and have been updated to reflect:

- a revised and more health protective target blood level
- more recent US data pertaining to the geometric blood lead concentration, which indicates decreasing concentrations from 1988 to 2004
- more recent US data regarding the geometric standard deviation (the measure of interindividual variability in blood lead concentrations within the adult population).

Although the update is based on US data, RSK considers that background blood levels in the UK will also be decreasing owing to lead pipes being replaced, lead no longer being used in fuel and lead paints being banned from internal use. Furthermore, RSK has run the equation with varying inputs to ascertain its sensitivity to certain parameters. Using the parameters outlined above RSK obtains a GAC of **600mg/kg** for an adult in a commercial setting. A similar value is obtained if all input parameters remain equal to those used in production of the former SGV but the soil ingestion rate is increased to reflect 50mg/day reported for the commercial scenario in SR3.

GAC derivation for other metals and organic compounds

Model selection

Soil assessment criteria (SAC) were calculated for compounds where SGV have not been published using CLEA v1.06 and the supporting UK guidance⁽¹⁻⁶⁾. Groundwater assessment criteria (GrAC) protective of human health via the inhalation pathway were derived using the RBCA 1.3b model. RSK has updated the inputs within RBCA to reflect the UK guidance⁽²⁻⁵⁾. The SAC and GrAC collectively are termed GAC.

Pathway selection

In accordance with EA Science Report SC050221/SR3⁽³⁾ the commercial scenario considers risks to a female worker who works from the age of 16 to 65 years. It should be noted that this end use is not suitable for a workplace nursery but also may be appropriate for a sport centre or shopping centre where children are present. In accordance with Box 3.5, SR3⁽³⁾ the pathways considered for production of the SAC in the commercial scenario are:

- direct soil and dust ingestion
- · dermal contact with soil both indoor and outdoors
- indoor air inhalation from soil and vapour and outdoor inhalation of soil and vapour.

Figure 1 is a conceptual model illustrating these linkages.

The pathway considered in production of the GrAC is the volatilisation of compounds from groundwater and subsequent vapour inhalation by workers while indoors. Figure 2 illustrates this linkage. Although the outdoor air inhalation pathway is also valid, this contributes little to the overall risks owing to the dilution in outdoor air.



Within RBCA, the solubility limit of the determinant restricts the extent of volatilisation, which in turn drives the indoor air inhalation pathway. While the same restriction is not built into the CLEA model, the model output cells are flagged red where the soil saturation limit has been exceeded.

An assumption used in the CLEA model is that of simple linear partitioning of a chemical in the soil between the sorbed, dissolved and vapour phase⁽⁴⁾. The upper boundaries of this partitioning are represented by the aqueous solubility and pure saturated vapour concentration of the chemical. The CLEA software uses a traffic light system to identify when individual and/or combined assessment criteria exceed the lower of either the aqueous-based or the vapour-based saturation limits. Where model output cells are flagged red the soil or vapour saturation limit has been exceeded and further consideration of the SAC to be used within the assessment is required. One approach that could be adopted is to use the 'modelled' solubility saturation limit or vapour saturation limit of the compound as the SAC. However, as stated within the CLEA handbook⁽⁴⁾ this is likely to be impractical in many cases because of the very low solubility/vapour saturation limits and, in any case, is highly conservative. Unless free-phase product is present, concentrations of the chemical are unlikely to be present at sufficient concentration to result in an exceedance of the health criteria value (HCV).

RSK has adopted an approach for petroleum hydrocarbons in accordance with LQM/CIEH⁽⁶⁾ whereby the concentration modelled for each petroleum hydrocarbon fraction has been tabulated as the SAC with the corresponding solubility or vapour saturation limits given in brackets. Therefore, when using the SAC to screen laboratory analysis the assessor should take note if a given SAC has a corresponding solubility saturation or vapour saturation limit (in brackets), and subsequently incorporate this information within the screening analytical discussion. If further assessment is required following this process then an additional approach can be utilised as detailed within Section 4.12 of the CLEA model handbook⁽⁴⁾ which explains how to calculate an effective assessment criterion manually.

Input selection

Chemical data was obtained from EA Report SC050021/SR7⁽⁵⁾ and the health criteria values (HCV) from the UK TOX⁽¹⁾ reports where available. For SAC for total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH), toxicological and specific chemical parameters were obtained from the LQM/CIEH report⁽⁶⁾. Similarly, toxicological and specific chemical parameters for the volatile organic compound 1,2,4-trimethylbenzene were obtained from EIC/AGS/CL:AIRE⁽⁷⁾.

For TPH, aromatic hydrocarbons C_5 – C_8 were not modelled since benzene and toluene are being modelled separately. The aromatic C_8 - C_9 hydrocarbon fraction comprises ethylbenzene, xylene and styrene. As ethylbenzene and xylene are being modelled separately, the physical, chemical and toxicological data for this band have been taken from styrene.

Owing to the lack of UK-specific data, default information in the RBCA model was used to evaluate methyl tertiary butyl ether (MTBE). No published UK data was available for 1,3,5-trimethylbenzene, so information was obtained from the US EPA as in the RBCA model. RBCA



uses toxicity data for the inhalation pathway in different units to the CLEA model and cannot consider separately the mean daily intake (MDI), occupancy periods or breathing rates. Therefore, the HCV in RBCA was amended to take account of:

- an adult weighing 70kg and breathing 14.8m³ air per day in accordance with the UK TOX reports⁽²⁾ and SR3⁽³⁾
- the 50% rule (for petroleum hydrocarbons, trimethylbenzenes and MTBE)⁽²⁾ where MDI data is not currently available but background exposure is considered important in the overall exposure.

Physical parameters

For the commercial end use, the CLEA default pre-1970s three-storey office building was used. SR3 notes this commercial building type to be the most conservative in terms of protection from vapour intrusion. The building parameters are outlined in Table 3.

The parameters for a sandy loam soil type were used in line with SR3⁽³⁾. This includes a value of 6% for the percentage of soil organic matter (SOM) within the soil. In RSK's experience, this is rather high for many sites. To avoid undertaking site-specific risk assessments for this parameter, RSK has produced an additional set of SAC for an SOM of 1% and 2.5%.

For the GrAC, the depth to groundwater was taken as 2.5m based on RSK's experience of assessing the volatilisation pathway from groundwater.

GAC

The SAC were produced using the input parameters in Tables 1, 2 and 3 and the GrAC using the input parameters in Table 4. The final selected GAC are presented by pathway in Table 5 with the combined GAC in Table 6.



Figure 1: Conceptual model for CLEA commercial scenario

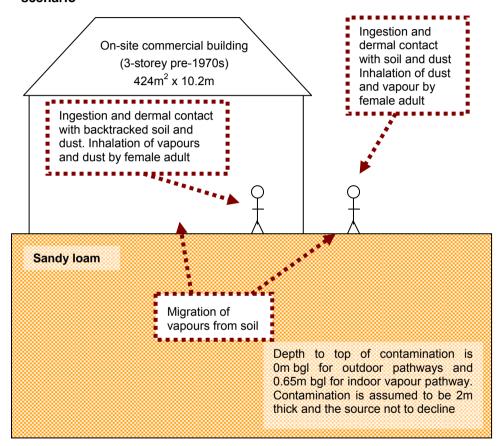


Table 1: Exposure assessment parameters for commercial scenario – inputs for CLEA model

Parameter	Value	Justification
Land use	Commercial	Chosen land use
Receptor	Female worker	Taken as female adult exposed over 49 years from age 16 to 65 years, Box 3.5, SR3 ⁽³⁾
Building	Office (pre- 1970)	Key generic assumption given in Box 3.5, SR3 ⁽³⁾ . Pre-1970s three-storey office building chosen as it is the most conservative in terms of protection from vapour intrusion (Section 3.4.6, SR3 ⁽³⁾)
Soil type	Sandy loam	Most common UK soil type (Section 4.3.1, Table 4.4, SR3 ⁽³⁾). Table 4 presents soil-specific inputs
Start age class (AC)	17	AC corresponding to key generic assumption that the critical receptor is a working female adult exposed over a 49-year period from age 16 to 65
End AC	17	years. Assumption given in Box 3.5, SR3 ⁽³⁾ . Data specific to AC exposure is presented in Table 2 and receptor specific in Table 3
SOM (%)	6	Representative of sandy loam according to EA guidance note dated January 2009 entitled 'Changes We Have Made to the CLEA Framework Documents' ⁽⁸⁾
	1	To provide SAC for sites where SOM < 6% as often
	2.5	observed by RSK
рН	7	Model default



Table 2: Commercial – receptor inputs for CLEA model

Parameter	Unit	Value	Justification
Exposure frequency (EF) (soil and dust ingestion)	day yr ⁻¹	230	
EF (dermal contact with dust. indoor)	day yr ⁻¹	230	From Table 3.9, SR3 ⁽³⁾ . The working week is assumed 45 hours including a 1-hour lunch
EF (dermal contact with soil, outdoor)	day yr ⁻¹	170	break each day. Indoor and outdoor exposure are weighted by the frequency of time spent
EF (inhalation of dust and vapour, indoor)	day yr ⁻¹	230	indoors and outdoors (8.3 hours a day and 0.7 hours a day respectively)
EF (inhalation of dust and vapour, outdoor)	day yr ⁻¹	170	
Occupancy period (indoor)	hr day ⁻¹	8.3	Box 3.6, SR3 ⁽³⁾ . Weighted average based on a nine-hour day including one-hour lunch being
Occupancy period (outdoor)	hr day ⁻¹	0.7	spent outside 75% of the year
Soil to skin adherence factor (indoor and outdoor)	mg cm ⁻² day ⁻¹	0.14	Table 8.1, SR3 ⁽³⁾ for age class 17
Soil and dust ingestion rate	g day ⁻¹	0.05	Table 6.2, SR3 ⁽³⁾ for age class 17
Body weight	kg	70	Table 4.6, SR3 ⁽³⁾ for female AC 17
Body height	m	1.6	Table 4.6, SR3 ⁽³⁾ for female AC 17
Inhalation rate	m³ day-1	14.8	Table 4.14, SR3 ⁽³⁾ for female AC 17
Max. exposed skin fraction (indoor and outdoors)	m ² m ⁻²	0.08	Based on adult female assuming face and hands are exposed. Table 4.7, SR3 ⁽³⁾



Table 3: Commercial – soil, air and building inputs for CLEA model

Parameter	Unit	Value	Justification
Soil properties for sandy loam			
Porosity, total	cm³ cm-³	0.53	Default soil type is sandy loam, Section 4.3.1, SR3 ⁽³⁾ . Parameters for sandy loam from Table 4.4, SR3 ⁽³⁾
Porosity, air filled	cm³ cm-³	0.20	
Porosity, water filled	cm³ cm-³	0.33	
Residual soil water content	cm ³ cm ⁻³	0.12	
Saturated hydraulic conductivity	cm s ⁻¹	0.00356	
van Genuchten shape parameter (<i>m</i>)	-	0.3201	
Bulk density	g cm ⁻³	1.21	
Threshold value of wind speed at 10m	m s ⁻¹	7.20	Default value taken from Section 9.2.2, SR3 ⁽³⁾
Empirical function (F _x) for dust model	-	1.22	Value taken from Section 9.2.2, SR3 ⁽³⁾
Ambient soil temperature	К	283	Annual average soil temperature of UK surface soils. Section 4.3.1, SR3 ⁽³⁾
Air dispersion model			
Mean annual wind speed (10m)	m s ⁻¹	5.0	Default value taken from Section 9.2.2, SR3 ⁽³⁾
Air dispersion factor at height of 1.6m	g m ⁻² s ⁻¹ per kg m ⁻³	120	From Table 9.1, SR3. Values for a 2ha site, appropriate to a commercial land use in Newcastle (most representative city for UK, section 9.2.1,SR3 ⁽³⁾)
Fraction of site with hard or vegetative cover	m ² m ⁻²	0.8	Section 3.4.6 and 9.2.2, SR3 ⁽³⁾ for average office such as that used in the commercial scenario
Building properties for office (pre-1970) with ground-bearing floor slab			
Building footprint	m ²	424	
Living space air exchange rate	hr ⁻¹	1.0	From Table 3.10, SR3 ⁽³⁾
Living space height (above ground)	m	9.6	
Living space height (below ground)	m	0.0	Assumed no basement.
Pressure difference (soil to enclosed space)	Ра	4.4	From Table 3.10, SR3 ⁽³⁾
Foundation thickness	m	0.15	