Site				amley S					Record of	Pombole	<u> </u>
Boring M	ethod	Shell a	nd auge	, light c	able perc	ussion.			_ŧ	Cont.	
Diameter	200	<u></u>					Date started	14/05/92	No. 6		
Ground L	evel.							O.D.	Sheet No.	2 of 3	
	Samples usitu tests		Depth of	Depth to	Date and		Dos	cription		Legend	O,D.
Depth	Туре	N	casing	Water	Depth	,				- 	
0.00	PU97					Ħ					
0.40	D			į		Claystone.					-
0.60	D					Stiff dark grey	fissured silty	clay.			
	İ				11					X	
11.20	D				i	E				8X	
1						#				X	i
1.50	PU97					Ħ				zx	
1.95	SPT	\$26	1		12	1				XX	
. ,					İ					X	
					15/5	Ħ					
12.70	Ð			ļ		Chiff duck men	Figured year	e silty clay with r	ertings of	<u> </u>	-
13.00	PU97]	13	silt and traces	of fossils.	silty clay with p	MITTINGS OF	×	
				1		Ħ				- ×	
13.45	SPT	S22									
,]				14	Ė				- ×	
				1	14	Ħ					
14.40	D			1						- xx	1
14.50	PU97					Ė				<u></u>	
	CD/T	004			15		· 1 · 14		an of ails		-
14.95	SPT	\$26				Stiff dark gre	y fissured silty	y clay with partin	gs or sm.	x	1
						<u> </u>					
	ļ			1							1
16.00	U102	1			16					<u> </u>	
16.00	0102		İ							× - ×	
16.50	SPT	S32		19/5	7	 				X	
10.50	Ď	555								8X	
17.00	D		ļ		17	甘				x	
						Spiff dowly and	v figuread var	y clayey silt with	nartings of	X X	+
17.50	U102					fine sand.	A Hearten Act	, canyon site with	hurringo or	<u> </u>	-
					18	H				* × × ×	1
18.00	SPT	S30		1	10	ΙĦ				* ; * · · ·	1
	D				.6.75	1#				* * * *	
					18/5	Burn 1 1	Co 1	a alore militare and	as af ails	X X	1
40.0-	,,,,,,		İ		19	and sometime	y nssured silt is fine sand.	y clay with partic	igs of stit	· ·	-
19.00	U102										
10 50	SPT	S27				 				x-	3
19.50	D	321	1			<u> </u>				X	-
Remark	s	<u>.l</u>		!						11	-
									Scale	1:50	
-									Fig.	1 b	

a production of the second

ſ	Site	Kings C	ross Pr	oject, C	amley St	reet								_=	<u></u>	
	Boring M				, light c		us	sion.				Recon	d of B	orcho	le [·]	
	Diameter				7 - 2				Date started	14/05/92	ļ,	No.	6	Co	nt.	
										·	O.D.	Sheet	No.	3	of 3	
	Ground L	Samplea			T . 1	-	Т		L <u></u>	<u></u>						
		unitu tests		Depth of	Depth to	Date and	١		Desc	eription					Legend	O.D.
	Depth	Туре	N	casing	water	Depth	-									
-				<u> </u>			H							Ľ		1
•							F									
_		!					Ħ								xx	
				1			Ħ							ļ	xx	ţ
	ļ ļ	ļ		Ì		21								Ŀ	- X	
	21.20	D					且							ł		
	21.50	U102		}	Ì		H							Ī		
	i			!		22	且									ļ
_	22.00	SPT	S38		0015	I I	H							l	<u> </u>	
		D			20/5 ⊽	1	П								<u>~_</u> _	ŀ
_		j		1			H									1
	22.80	D			ļ	23									xx	
	23.00	U102			1										××	
_		_		-	İ	1	ŀ	[xx	
	23.50	D			ļ		<u> </u>]							× × ×	
]			Ì		24	#								_ x	3.53
	24.20	מ					ĮE	Stiff dark grey of fine sand ar	fissured ver	y silty clay	with th	in laye	2178 ↑ 4. F	? /	· ×	- 1
	24.50	U102			1		IE	Stiff to very s	iff brown an	d light grey	heavil				x ×	•
_					-	25		silty clay.					H F	? <u>. </u>		4.33
	25.00	SPT	\$60			25	F	Stiff to very s fissured silty	tiff light grey	, red and b	rown h	eavily				
		D			1		-	fissured silly	ciay. Some s	nckenside					× ×	
-					1	19/5		1			WF.	W (- X	
			.	1		26	1	-							XX	
	26.00	U102						3							XX	
_		1	}			 	1	₫							8 X	
•	26.50	D					-	4							×	
_	27.00	n		1		27	H	3							XX]
	27.00	D			İ	ĺ	1	3								7
	27.50	U102	1	1				₫								
-	27.30	102	[1				-								
	28.00	D		ļ		28	Ħ	Ħ							<u> </u>	- - -
•			1					Ħ								<u> </u>
	28.50	D]								x	4
:	.					29	, <u>L</u>								X	4
_	29.00	U102	-			1 25		Ħ							Z	\$
								H	-1 20 FO		····					-
	29.50	D			}	20/5	ļ	End of boreh	ole at 29.30	щенез.						
				mala 4a8	cen at 22	40 metr	, T	Π								<u></u> ,
	Remar	ks W	ater sai	ubie m	içi) at 44	. TU INCU	w.	'	•							
_																
_												Sea	sie	1:	50	
•	ĺ											Fig		1 (2	

A THE WARRANT AND A SECOND SEC

	· · · · · · · · · · · · · · · · · · ·		roject, C									
Boring M			nd auge	····				1·····		Record of Bo		
Diameter	200/	150	<u>530</u>	<u>5-18ت</u>	€,	187	3361.8N	Date started	22/05/92	No. 7	1<×	2
Ground 1	evel			,	.,			<u></u>	O.D.	Sheet No.	1 of 4	
	Samples nsitu tests		Depth	Depth	Date						İ	
-			of casing	LO Water	and Depth			Descr	iption		Legend	۱ ۱
Depth	Турс	N	casmig	water	Deput						- 	<u> </u>
				İ	ļ] [Cobblestone se	ts over reintor	cea concrete.			1
).50	D					- -		y sand with fli	nt gravel, some	angular		T
0.60	SPT	S 63		Ì			stone and ash.	Fotona elata e	ravel, ash and s	ond.	-₩₩	-
.00	D					1			silty clay with		-	┡
1.30	D					Œ	rubble, stone a		Silty Clay With	ULICK	\otimes	L
.50	SPT	S9					Soft brown silt	y clay with bri	ck rubble, grave	l and ash.	-‱	
		•	1			2 F					\otimes	1
İ						F	Soft brown and	greenish grey	organic silty cla	ay with		Γ
2.50	D			Ì		+	traces of ash an	io a little grave	я.			1
	~					, E						
3.00	U102				3	3	1					Ĺ.
						I	Firm brown fis of orange silt.	sured silty clay	with partings a	ind lenses	× _ ×	
3.50	D] 01 01 <u>-11</u>		eralther W"	Y rc . c	x_	
5.00	D				4	4	1				x	1
1.00	ע						}					
.50	U102			<u> </u>		\f					<u> </u>	1
1			22/5	<u>.</u>	l .	_ [}				7X	
5.00	SPT	S14			22/5	• E	Firm to stiff br	own fissured s	ilty silty clay wi	th some	Z _ x	
	D			}		Į	faces coloured	ige siit and sei blue.	enite crystals. I		xx	
5.50	D									rc • c r	× ×	
5. 0 0	U102			-	(5 	1				×x	
						ΙĘ	1				xx	
					ļ		becoming stiff				× ×	
						, <u> </u>	1				xx	
7.00	D		23/5		}	` <u> </u>					× ×	
7.50	U102		2/6			1	Fissure faces co	oloured orange			×x	
				İ		. <u> </u>					X X	
3.00	SPT	S16			{	8	Claystone.	S	•	rc-cr8	X	f
ایی	D					Į	Stiff dark grey	nssured silty o	ay.		<u> </u>	
3.50	D		ļ]				<u></u>	
0.00	U102				9	• ├	1				<u> </u>	
	- 4 ***										<u> </u>	
.50	D					IE	Claystone. Stiff dark grey	finance de la la la la la la la la la la la la la	lau.	لاد- د رو		
			<u> </u>	<u></u>	<u></u>	1	odii dark grey	nssured silly C	aay.		\$x	
Remarks							·					
										Scale 1:	:50	<u></u>
										Fig. 2		_

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Site	Kings C								
Boring N	fethod	Shell a	nd auge	r, light c	able per	cuss			
Diameter	200/	150					Date started 22/05/92 No. 7	Cont.	_
Ground	Level		,			_	, O.D. Sheet No.	2 of 4	
	Samples		T	Γ	T				
	nsitu tests		Depth	Depth	Date and		Description	Legend	
Depth	Туре	N	casing	water	Depth		•		ļ
	<u> </u>			<u> </u>	1	1		<u>x</u> x	_
10.00	D					H		A	ı
						Ħ			
10.50	U102		-	1		\mathbb{H}		X	Į.
			ì		1 11	Ш		× ×	ĺ
11.00	SPT	S21			23/5 11			× ×	
	D			1				<u>X</u>	
					ļ			××	1
			1						ı
12.00	U102		I		12			<u> </u>	
	D		1			H			
12.50	D		ļ			什	Stiff to very stiff dark grey fissured silty clay with	× ×	Γ
12.30	"		İ			ΙĦ	Stiff to very stiff dark grey fissured silty clay with partings of silt and traces of fossils.	J X	1
		ĺ		}	13	H			
13.00	D					IН			
		ļ	1		ŀ	ᄖ		F	1
13.50	U102	Ì	1	or -		Ш	·	<i>y</i> - x	1
			1	S.L. 7	14	Ш	•	- X	l
14.00	SPT	S26	-	2913	17				1
	D	Ì	}		1	ΙĦ		X X	1
		1				H		xx	3
14.80	D	1				肼	Stiff dark grey fissured very silty clay with partings of silt and sometimes fine sand.	8 - X	1
15.00	U102				15	H	silt and sometimes fine sand.	xx	1
	'	-			ţ	Щ		X	a
15.50	D			1	1	甘			3
13.50	-					IB			-
16.00	D				16	用		×	1
10.00	"		i		ļ	H		F	ď
16.50	U102		1					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Į
16.50	0102			1		ΙĦ			7
					17	H			9
17.00	SPT	\$34						××	₫
1	"	ļ		S.L. v	Z .	出		x	2
	1			1/6		ΙĦ		X	1
	1				18	H	Stiff dark grey fissured very clayey silt with partings of	××	ŧ
18.00	U102				'*	ΙH	fine sand	<u> × </u>	\forall
Ì	-					旧	لد حديد الد	<u>*</u> -x <u>*</u> x	4
18.50	D				24/5	IE		^^~~~ <u>^</u> _x	4
	j					18		× × × ××	4
1	1		-		19	用		x * x *	4
	1			1			Stiff dark grey fissured silty clay with partings of silt		3
19.50	U102		1	1		11	and sometimes fine sand.	8	4
17.30	0 102		1		1		· ·		$\frac{1}{2}$
	<u> </u>	<u>.</u>				JН			_1
Remark	KS.						•		

Scale 1:50

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Fig.

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	Site	Kings	Cross Pr										
~~	Boring l	Method	Shell a	nd auge	r, light	cable pe	rcu	ssion.			Record	of Borehole	
	Diamete	r 200	/150						Date started	22/05/92	No.	7 Cont.	
	Ground	Level								O.D.	Sheet N	lo. 3 of 4	
_		Samples		Depth	Depth	Date			<u> </u>				T
	<u> </u>	nzitu testa	1	of	to	and			Desc	ription		Legend	O.D.
	Depth	Турс	N	casing	water	Depth							<u> </u>
٠.	20.00	SPT	S40				H	Very stiff dark	grey fissured	silty clay with p	ertings o	f San	4
•		D						silt.		Lcs	c L	X	4
_	20.50	D					ΙĦ					·	d
•						21	旧					X	3
_	21.00	U102	1				H						蕌
	21.50	D											ā .
	21.30	"											
_	22.00	D				22	H						1
		-					目						1
	22.50	U102					用						1
	-				•							- X-	4
	23,00	D				23	H					× ×	9
							目					7	
							目						3
i	24.00	77100				24	H					,	
-	24.00	U102					目			·			
	24.50	SPT	S52				目	Very stiff light	grey, brown : e slickensided	and red heavily fi l fissures.	ssured		9
	24.50	Ď	932				H	any only. Oone	o shokolisido.			x	
						26/525	H			WRUHC -	C 1-	- XX	
-	25.50	U102					H					7	
			-			26	H					x	
	26.00	D				20						xx	
_												- X	
							H					X	1
<u></u>	27.00	U102				27						x- ·	1 1
	21.00	D	:										
	27.50	D					\forall						•
-						_	月					×	
_ [28.00	D				28	H					X	
[Ħ					x	
	28.50	U102					H					×x	
- [_	Į			29	F	Colourate	_ t:_t+ =	_11		X	
-	29.00	D			-	~~		Colour change to	o light grey a	na prown.		Z X	
].	29.50	a			ļ		H					<u> </u>	}
Ī	ا 30.50	"		İ	Ì							*x	
~ ├	Remarks	<u>i</u>			!		П.	,	······································				L,
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••													
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-													
- [Scale	1:50	
	_										Fig.	2 c	
_ L	P										• •8•		J

3 July market broom some more and and

Site		Cross Pr						<u> </u>	The section of the se	
Boring l			nd auge	r, light	cable pe	reus		Record of	Cont.	
Diamete	т 200	/150	<u> </u>				Date started 22/05/92	<u> </u>		
Ground	Level		····				. O.D.	Sheet No.	4 of 4	
	Samples insitu tests	T	Depth of	Depth to	Date and		Description		Legend	O.D
Depth	Турс	N	casing	water	Depth					
30.00	U102					目				
** **	ana	S68		•		甘				
30.50	SPT	308				14	•			
	-				1/6 31	Н				
31.30	D			ļ]	IF	iff to very stiff black fissured silty clay with	1	<u> </u>	10
31.50	U102			•		H	iff to very stiff black fissured silty clay with minations of light grey sand. Some slickens sources.	sided	<u>¥</u> =₹	20.
					32	Щ				
						Ή	ery stiff light brown, light grey, purple, red own heavily fissured silty clay. Some slick	ensided		
20 50			.			甘	ssures.	, - c L		
32.50	D		1							
33.00	U102				33	H			<u> </u>	
55145				-		18			<u> </u>	
33.50	D					IE			XX	
					34	H				
34.00	D				'				x	
34.50	U102								<u> </u>	
34.3U	0102]	ļ				zx	
35.00	SPT	S38			35	; <u> </u>			× × ×	
	D	150 mm	ון		2/6		nd of borehole at 35,30 metres.			_
					36	, III				
						ΙH				
			İ							
				ļ	37	'旧	•		1	
1	İ			İ		H				ļ
					-					
					38	3 H				
										İ
					-	, LF				
		1	[39	" []		•]
						1F				
Remar	ks Or	rasiona	slow se	epages	of water	LE	_			I
**************************************	w.	ater san	ple tak	n.	of water	•	•			
								Scale	1:50	
I								Fig.	2 d	

Control of the State and Anthony Control of the Con

Site	····		roject, C								
Boring k	·········	*******	nd auge	r, light	cable	perc			Record of Bo	reholo	
Diameter	r 200						Date started 08/06/92		No. 8		
Ground i	Level	530	156 -	25E,	18	34.	26.4 N - 0.1	D.	Sheet No.	1 of 4	
	Samples naitu testa		Depth of	Depth to	Date	:	Description			Legend	0.0
Depth	Турс	N	casing	Weter	Dept	h					
	1						Tarmac.				-
0.50	SPT D	S4	:			1	Very loose to loose brick rubble and brown occasionally with a little clay.	sano	d		
1.50	SPT D	S6				2					
	İ		i			-	0.61 111 1 111 1 1 1 1 1				_
							Soft brown rubbly clay with bricks and ash	•			
2.80 3.00	D SPT	C4	8/6	1	8/6	3 H					
5.00	SFI		{		0,0		Soft to firm, becoming firm, brown silty cl	av w	ith	XXXXX	-
		ŀ]			calcareous nodules.	,			
			ì								
4.00		İ	ļ			4 H				× ×	
4.00	D									8	
	Ditor									<u>zx</u>	
4.50	PU97						Firm brown fissured silty clay with parting	e and	l lenses	<u> </u>	-
						5	of orange silt. Fissure faces coloured blue.	,	1011303		
		İ	1			[
	_			1		{				<u>x</u> x	
5.50	D			-	1	[<u></u> x	
		•				6				X	
5.00	PU97									<u> </u>	
5.40	SPT	\$19					Becoming firm to stiff.				
	D		1				_				
	_		1			7				XX	_
7.00	D						Firm to stiff brown fissured silty clay with crystals. Fissure faces coloured blue.	selen	nite	× ×	
							organia. Present faces continued offic.			<u>*</u> -x	
7.50	PU97		1			1				<u> </u>	
						8				ZX	
			ł			~ :					
											_
8.50	D						Stiff brown fissured silty clay with selenite	crys	tals.	xx	
		1				9	Fissure faces coloured orange.			X	
9.00	PU97					'				<u></u>	
9.40	SPT D	S22								X	
	L		9-12/5	L	L						
Remarks	I	<u> </u>	1 9-12/0		ļ		•				
								_			

Fig. 3 a

Hamiltonia and the control of the control

Site	e Kings Cross Project, Camley Street ing Method Shell and auger, light cable percussion.									Record of Borchole					
Boring M		Shell an	d auger	, light	cable	per	cus	sion.	T .	00.00.00		4	8 8	Cont.	
Dismeter	200		···						Date started	08/06/9		 			
Ground L	_cvcl				,						O.D.	Sheet N	ło.	2 of 4	
	Samples		Depth	Depth	Dat		Ì		-						Ö.
	nsitu tests		of 	lo water	Dep				Des	eription				Legend	U.
Depth	Турс	N	casing	wates		, H.	1	Stiff dark grey	Secured silty	clay some	etimes v	vith iron		x	
]					9/6		H	pyrites.	lisauten aura	Ciny Sour	JILILOU V		•	- X	
10.50	PU97			İ		1	H								
10,30	1071				-		H							-XX	
						11	E							- X	
:							且								
11.50	D					İ								<u> </u>	
	DUIG					12									
12.00	PU97				1		旧								
12.45	SPT	S22					E							- X	
	D					13					<u> </u>				-
	_				İ	13		Claystone.							
13.20	D	060					E								
13.50	SPT	C50+ 25 mm													
14.00	D					14	H	mile 1 1		بر منائب مامر			~	7X	-
14.00								Stiff dark grey	rissured ver	y snry cia;	7-			XX	1
14.50	ם						\ F							ZX	
						15	Æ							XX	
15.00	PU97						=							- X	
15.40	SPT	S34	ļ				-							ZX	
	D				İ									X	
					1	16								- X	
16.40	D								y fissured ver	y silty cla	y with p	artings :	and		1
16.50	U102			}				lenses of silt a	and sometime	s tine sand	1.			×	4
17.00	D					17	H							<u> </u>	4
17,000				1	Ì		1							<u> </u>	2
17.50	۵							<u> </u>						XX	4
	1	<u> </u>			10	/618	, -	-						- X	-
18.00	U102							}						8X	<u></u>
18.50	SPT	S34		ļ			{	<u>-</u>						X	5
13,30	D														4
	_		ļ			19	' [×	4
19.20	D				ļ			Stiff dark gre	y fissured ve	ry clayey	silt with	partings	s of	× -×	†
19.50	U102							fine sand.	-	-				\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	֡֝֟֝֟֝֟֝ ֚
Remar	ks	<u> </u>			L		Ш	J				······································			l
												Scale		1:50	
İ												Fig.		3 b	

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Appendix B

Hazard screening assessment

B1 Hazard screening assessment

B1.1 Introduction

To simplify the assessment of risks, UK statutory guidance allows the use of authoritative and scientifically based guideline values for the initial hazard screening assessment, provided that such guideline values are available and are appropriate to the site circumstances of the pollutant linkages in question. The hazard screening assessment is used to identify Contaminants of Concern (CoCs) that may pose a risk of harm to human health, or a risk of significant pollution of groundwater at the site.

B1.2 Soil Quality

B1.2.1 Hazard Screening Guideline Values

The following guidelines have been used for the assessment of soil contamination at the site:

- UK Contaminated Land Exposure Assessment (CLEA) soil guideline values (SGVs) for commercial/industrial land-use.
- Arup Generic Assessment Criteria (GAC) derived for soils using CLEA UK for a commercial/industrial land-use were used where no SGVs are available.
- UK ICRCL Guidance Note 64/85 for asbestos on contaminated sites.

B1.2.2 CLEA Statistical Analysis

As recommended by the Department for Environment, Food & Rural Affairs (DEFRA) and the EA, Arup has carried out statistical tests (mean and maximum value tests) to quantify uncertainties associated with variation of contaminant concentrations across the site, and the sampling and chemical analysis of soil samples (see Section 4, Appendix A of CLR 7).

Mean Value Test

The mean value test compares the relevant screening guideline values with the upper 95th percentile (95% confidence limit) of the mean measured concentration and has been applied to the data set of soil chemical test results for the site. Where the data set passes the mean value test, this indicates that no further action is warranted.

Maximum Value Test

Measured contaminant concentrations that exceed the selected screening guideline values require some further consideration even when the mean value test has been passed. In considering whether further sampling and analysis is required, the maximum value test has been carried out to determine whether the maximum value in a sample set classifies as a statistical 'outlier'. Outliers are data points that do not fall within the expected distribution of measurements for the sample population.

If the maximum value is assessed to be a statistical outlier this could indicate the presence of a localised and/or largely undiscovered area of contamination (hotspot), or be the result of a measurement or recording error. Further work would be required, including more detailed information review and/or site investigation, to delineate contaminant hotspot areas.

B1.2.3 Soil Quality Assessment

Results of soil chemical testing from the CTRL site investigations have been compared to hazard screening guideline values derived as detailed above. The results and the screening values for the sample locations beneath the GW&B footprint are summarised below, and the laboratory results are included in full in the following spreadsheet.

Determinand	Units	No of Samples	Range Measured	Screening Values	Number of Samples
		Tested			Exceeding
					Screening

					Value
Arsenic	(mg/kg)	61	1.6 – 414	500 ¹	0
Cadmium	(mg/kg)	61	0.5 – 13	1,400 ¹	0
Chromium	(mg/kg)	61	5 – 170	5,000 ¹	0
Hexavalent Chromium	(mg/kg)	25	2-6	_	_
Copper	(mg/kg)	61	16 – 1700	44,800 ²	0
Lead	(mg/kg)	61	3 – 7,800	750 ¹	18
Mercury	(mg/kg)	61	0.1 – 14	480 ¹	0
Nickel	(mg/kg)	60	4 – 150	5,000 ¹	0
Selenium	(mg/kg)	52	0.1 – 5	8,000 ¹	0
Zinc	(mg/kg)	61	38 – 2,600	337,000 ²	0
Total Cyanide	(mg/kg)	14	1 – 290	343 ³	0
Free Cyanide	(mg/kg)	17	1 – 10	140 ⁴	0
Thiocyanate	(mg/kg)	13	2 – 220	_	-
Total Phenol	(mg/kg)	40	0.3 – 2.7	21900 ¹	0
Gasoline Range Organics*	(mg/kg)	15	0.1 – 6.2	66.4 ²	0
Diesel Range Organics*	(mg/kg)	21	0.1 – 1,400	641 ²	2
Mineral Oils*	(mg/kg)	3	128 – 1539	641 ²	1
Aromatic Hydrocarbons*	(mg/kg)	28	5 – 6,600	641 ²	2
Benzene	(mg/kg)	5	<0.001 - 0.01	1.65 ²	0
Toluene	(mg/kg)	8	0.003 - 0.2	150 ¹	0
Ethylbenzene	(mg/kg)	8	<0.001 - 0.02	48,000 ¹	0
m,p-Xylenes	(mg/kg)	8	<0.001 – 0.2	344 ²	0
o-Xylene	(mg/kg)	8	<0.001 - 0.23	419 ²	0
Naphthalene	(mg/kg)	15	0.02 - <10	293 ²	0
Benzo(a)pyrene	(mg/kg)	14	1 – <10	29.6 ²	0
Fluorene	(mg/kg)	14	1 – <10	59,400 ²	0
Asbestos	%	17	<0.001	_	_
pH value	(pH units)	61	6.4 – 11.6	-	_

Key:

- 1. CLEA Soil Guideline Values (SGV) for commercial/industrial use (2002 to 2005), SOM 1% assumed.
- Arup generic assessment criteria (GAC) for commercial/industrial use using the CLEA UK software (2007), SOM 1%
 assumed

*PRO, DRO and Mineral Oil results have been screened against the lowest Arup GAC TPHCWG carbon band for SOM 1% which is present within the fraction analysed. PRO results have been screened against the Arup GAC for aliphatic TPHCWG carbon band C₈ to C₁₀ and mineral oil results have been screened against the Arup GAC for aromatic TPHCWG carbon band C₁₀ to C₁₂.

3. Arup GAC for complex cyanide (low free cyanide concentrations and therefore cyanide is mostly complexed) using

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information contained in TOX5

4. Arup GAC derived using acute toxicity information contained in TOX5

The hazard screening assessment indicates that the concentrations of four contaminants were above their screening criteria, in some of the samples, as follows:

- a. 18 samples from 11 locations contained elevated lead results;
- b. Two samples from neighbouring trial pits contained elevated DRO results;
- c. One sample recorded an elevated mineral oil result; and
- d. Two samples from two locations contained elevated aromatic hydrocarbons.

The significance of these exceedances is discussed in Section 4.3 of the report.

B1.3 Groundwater Quality

The EA set out advice to third parties with respect to pollution of controlled waters in a technical guide of the same name dated May 2005. Groundwater results have been screened initially against Environmental Quality Standards (EQS) for freshwater as referenced in the technical guidance. Where no EQS's are available for a compound UK drinking water standards (DWS) have been used.

Four groundwater samples were taken from the following standpipes:

- OT3745A with a response zone in the Alluvium beneath the Made Ground
- SA7328 with a response zone in the top of the London Clay beneath the Made Ground
- SA7381 with a response zone in the Made Ground/London Clay
- TP7424 with a response zone in the Alluvium beneath the Made Ground

Perched groundwater has been sampled within the four standpipes and analysed for a wide range of determinands including heavy metals, inorganics and a range of hydrocarbons.

The groundwater chemical test results are shown in full in Table 2 and are summarised below:

- Concentrations of all the metals analysed were below the relevant EQS, with the exception of copper, lead and zinc.
 - Copper was elevated above the screening criteria of 0.028mg/l in three samples with concentrations ranging between 0.05mg/l and 0.16mg/l.
 - Lead and zinc concentrations were elevated above the respective screening criteria of 0.28mg/l and 0.25mg/l in one groundwater sample taken from London Clay with a lead concentration of 0.88mg/l and a zinc concentration of 1mg/l.
- 2. Concentrations of ammonia were elevated above the screening criteria in all three samples tested, with concentrations ranging between 1.3mg/l and 4.5mg/l.
- 3. Hydrocarbons were identified in the diesel range (>C₁₀) ranging between 1mg/l and 3.3mg/l which all exceeded the DWS of 0.01mg/l.
- 4. One sample was tested for phenol and reported a concentration of 0.04mg/l which slightly exceeded the EQS of 0.03mg/l.
- 5. Two total sulphate results exceeded the EQS of 400mg/l with concentrations of 1400mg/l and 2370mg/l respectively.

The hazard screening assessment indicates that in general concentrations of heavy metals and inorganics are low and below the relevant screening criteria within the perched water. However, concentrations of TPH, copper, lead, zinc, sulphate, ammonia and sulphate are slightly elevated in relation to the screening criteria within certain standpipes. The significance of these exceedances is discussed in Section 4.3 of the report.

B1.4 Leachability

Five Made Ground samples were submitted for leachability analysis. The leachate was tested for metals only. The results provide a useful indication of general leachability. The metal leachability results have been screened against EQS. The results were all below the screening criteria suggesting a low metal leachability.

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⁴ Environment Agency (May 2005). Environment Agency Technical Advice to Third Parties on Pollution of Controlled Waters for Part IIA.



APPENDIX B

Highways Plans approved under the Southern Infrastructure Works submission





