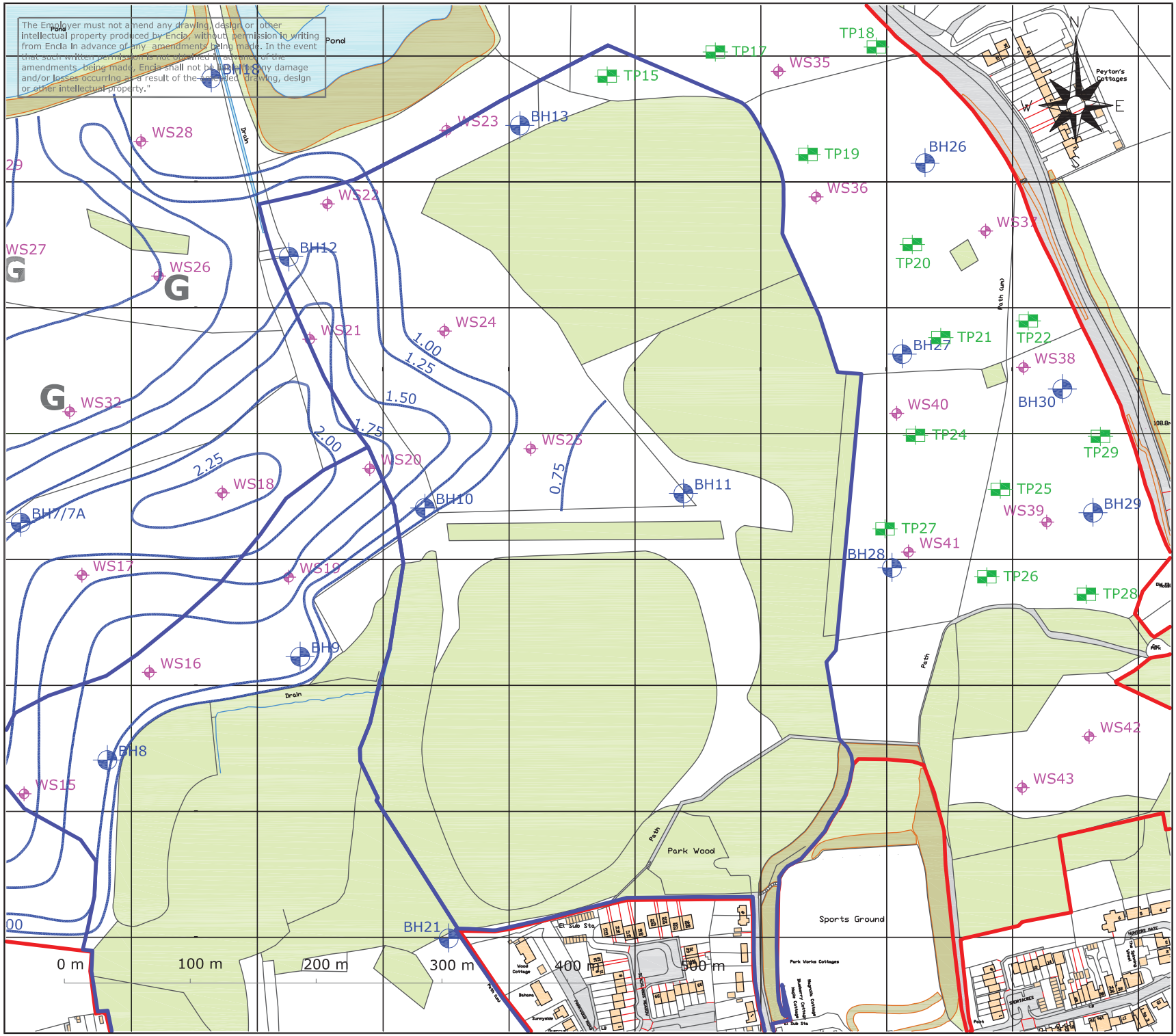
APPENDIX E2



KEY

- SITE BOUNDARY
- BEECHFIELD QUARRY AREA BOUNDARY
- TP1 — ENCIA TRIAL PIT (2011)
- BH1 — ENCIA BOREHOLE (2011)
- WS1 — ENCIA WINDOW SAMPLE (2011)
- 1.50 — APPROX THICKNESS OF MINERAL CAP/RESTORATION SOILS (m)
- G — 1mm GEOMEMBRANE IDENTIFIED

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CLIENT

EVONIK DEGUSSA UK HOLDINGS LTD

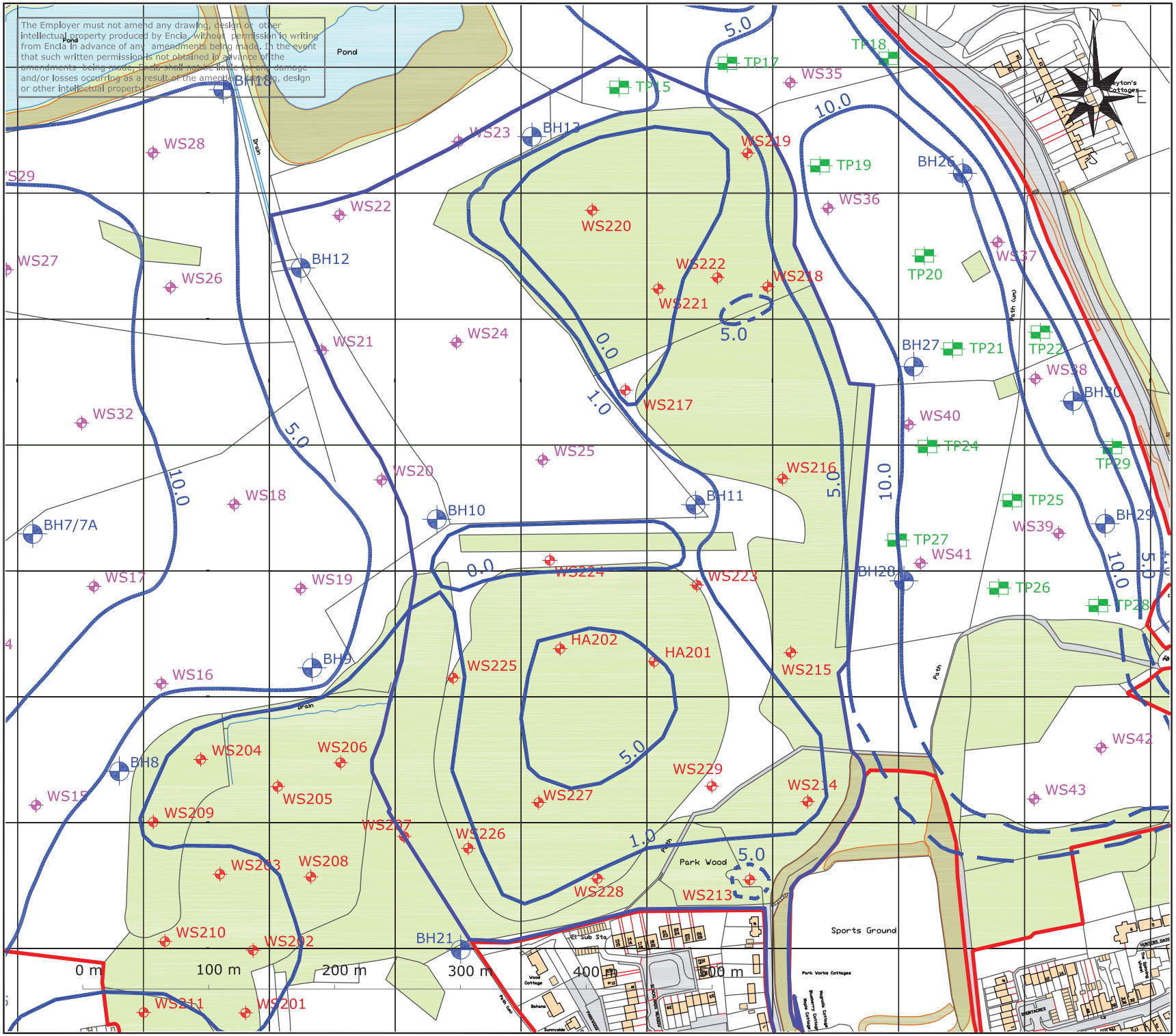
JOB TITLE

FORMER LANDFILLS/QUARRIES REDHILL, SURREY

DRAWING TITLE

APPROXIMATE MINERAL CAP/RESTORATION SOILS THICKNESS - BEECHFIELD QUARRY

STATUS	FINAL	
DRAWN BY: KL	SIGNATURE:	DATE: 22/05/2013
APPROVED: AJA	SIGNATURE:	DATE: 22/05/2013
SCALE: 1:3000@A3	DRG No.: 20096-E-9	



KEY

- SITE BOUNDARY
- BEECHFIELD QUARRY AREA BOUNDARY
- WS201 — ENCIA WINDOW SAMPLE (2012)
- TP1 — ENCIA TRIAL PIT (2011)
- BH1 — ENCIA BOREHOLE (2011)
- WS1 — ENCIA WINDOW SAMPLE (2011)
- 10.0 — APPROXIMATE DEPTH OF MADE GROUND (m)

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CLIENT

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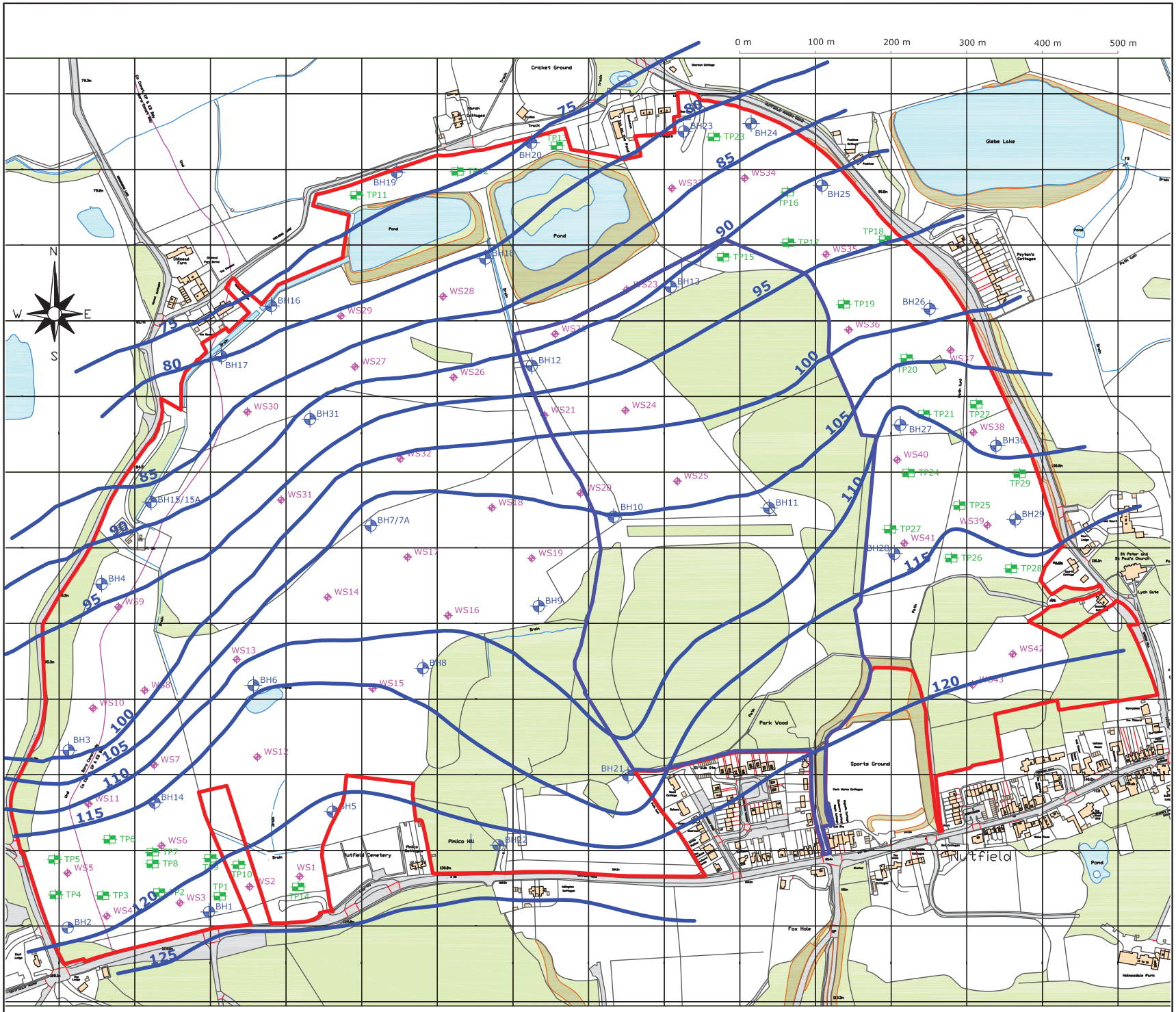
JOB TITLE

FORMER LANDFILLS/QUARRIES REDHILL, SURREY

DRAWING TITLE

APPROXIMATE DEPTH OF FILL MATERIALS - BEECHFIELD QUARRY

STATUS	FINAL	
DRAWN BY: KL	SIGNATURE:	DATE: 22/05/2013
APPROVED: AJA	SIGNATURE:	DATE: 22/05/2013
SCALE: 1:3000@A3	DRG No.: 20096-E-10	



KEY

SITE BOUNDARY

BEECHFIELD QUARRY AREA BOUNDARY

85 APPROXIMATE GROUNDWATER CONTOUR (mAOD) (11-12 December 2012)

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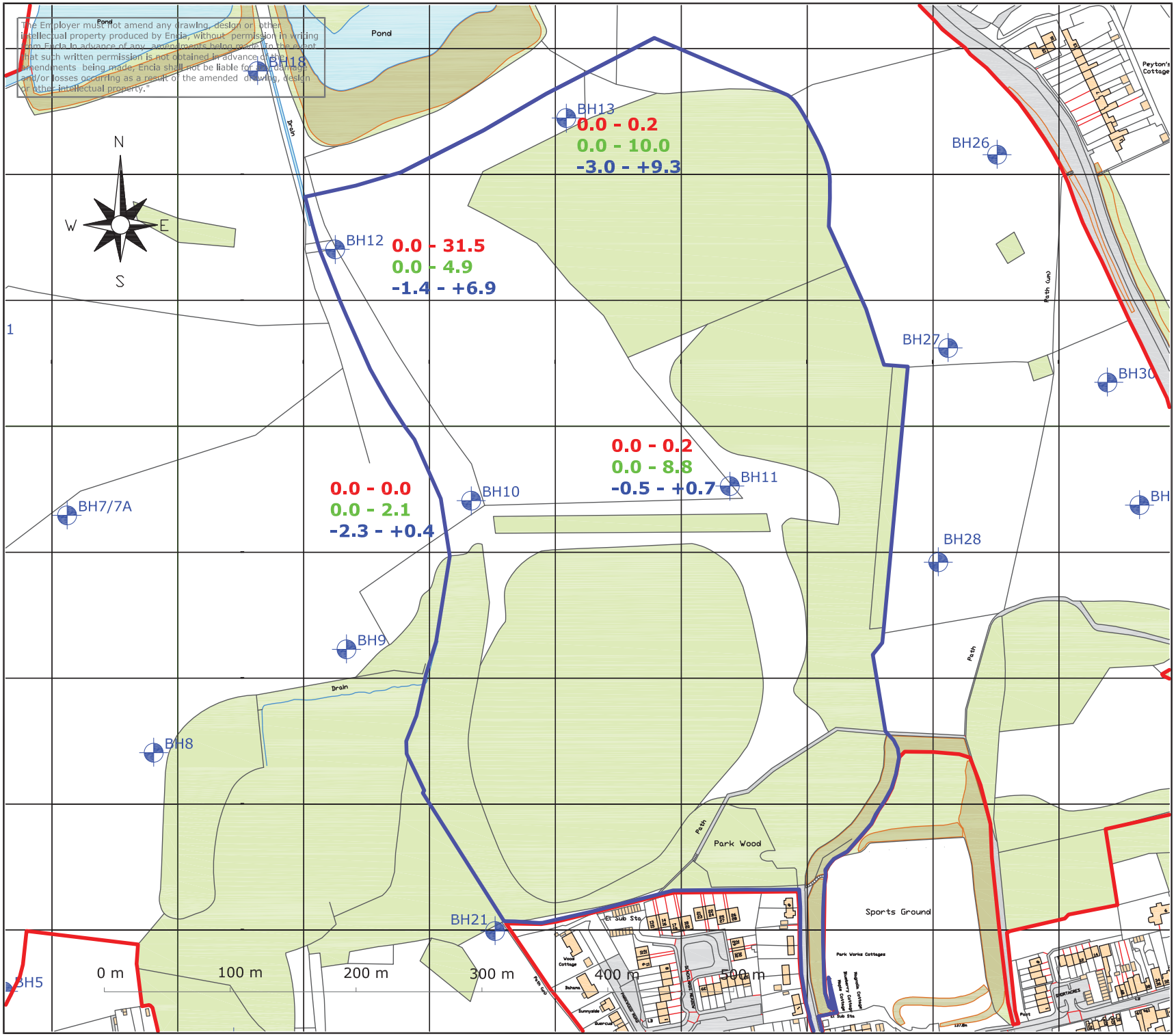
JOB TITLE

FORMER LANDFILLS/QUARRIES REDHILL, SURREY

DRAWING TITLE

APPROXIMATE GROUNDWATER CONTOURS (DECEMBER 2012)

STATUS	FINAL	
DRAWN BY: KL	SIGNATURE:	DATE: 22/05/2013
APPROVED: AJA	SIGNATURE:	DATE: 22/05/2013
SCALE: 1:5000@A3	DRG No.: 20096-E-11	



KEY

- SITE BOUNDARY
- BEECHFIELD QUARRY AREA BOUNDARY
- BH1 ENCIA BOREHOLE (2011)

CH4 (%v/v)
CO2 (%v/v)
Flow (l/hr)
October 2011-March 2013

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CLIENT
EVONIK DEGUSSA UK HOLDINGS LTD

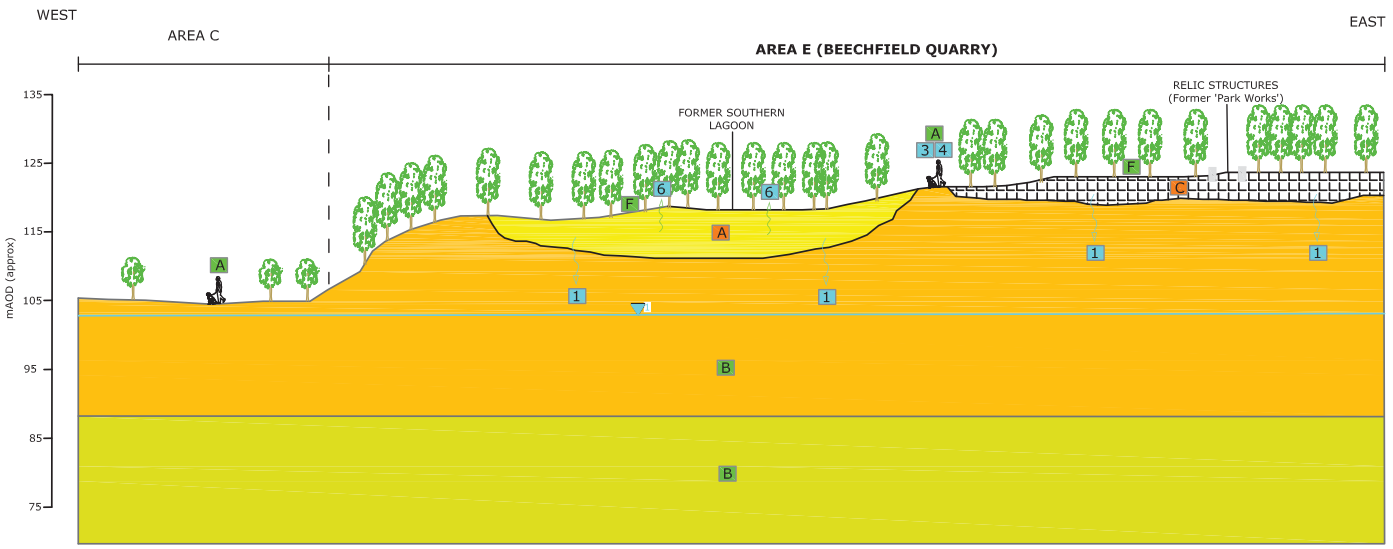
JOB TITLE
FORMER LANDFILLS/QUARRIES REDHILL, SURREY

DRAWING TITLE
LANDFILL GAS CONCENTRATIONS - BEECHFIELD QUARRY

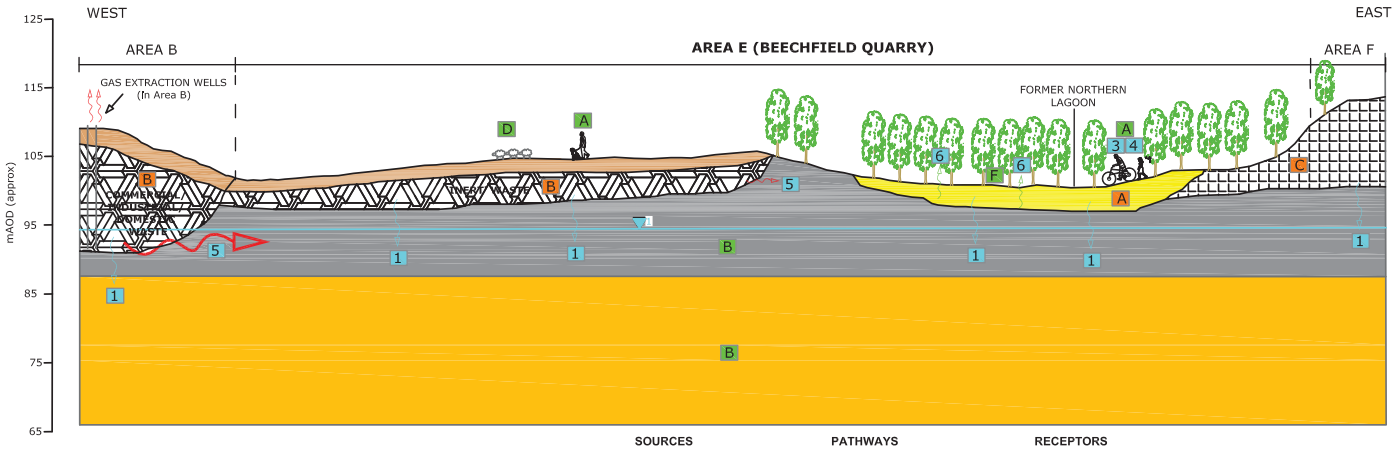
STATUS: FINAL

DRAWN BY: KL	SIGNATURE:	DATE: 22/05/2013
APPROVED: AJA	SIGNATURE:	DATE: 22/05/2013
SCALE: 1:3000@A3	DRG No.: 20096-E-12	

SOUTHERN SECTION



NORTHERN SECTION



SOURCES PATHWAYS RECEPTORS

KEY

- RESTORATION SOILS/CAP
- WASTE
- MADE GROUND (Reworked Natural)
- MADE GROUND (Yellow Lagoon Silt)
- FOLKESTONE BEDS
- SANDGATE BEDS
- HYTHE BEDS
- 1 GROUNDWATER
- 2 SURFACE WATER

- A LAGOON SILTS - Arsenic, SO4
- B WASTES
- C MADE GROUND: - Reworked natural strata (Arsenic, BaP)

- 1 LEACHING/MIGRATION TO GROUNDWATER
- 2 GROUNDWATER MIGRATION
- 3 INJESTION/DERMAL CONTACT
- 4 INHALATION
- 5 HAZARDOUS GAS MIGRATION
- 6 VEGETATION UPTAKE

- A SITE USERS (Walkers/cyclists)
- B CONTROLLED WATERS (Sandgate Beds Secondary 'A' and Folkestone/Hythe Beds Prindpal Aqulfers)
- C CONTROLLED WATERS (Surface Waters - Angling Ponds and Country Park)
- D LIVESTOCK
- E SITE USERS (Anglers)
- F AQUATIC/WOODLAND ECOSYSTEMS

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CLIENT

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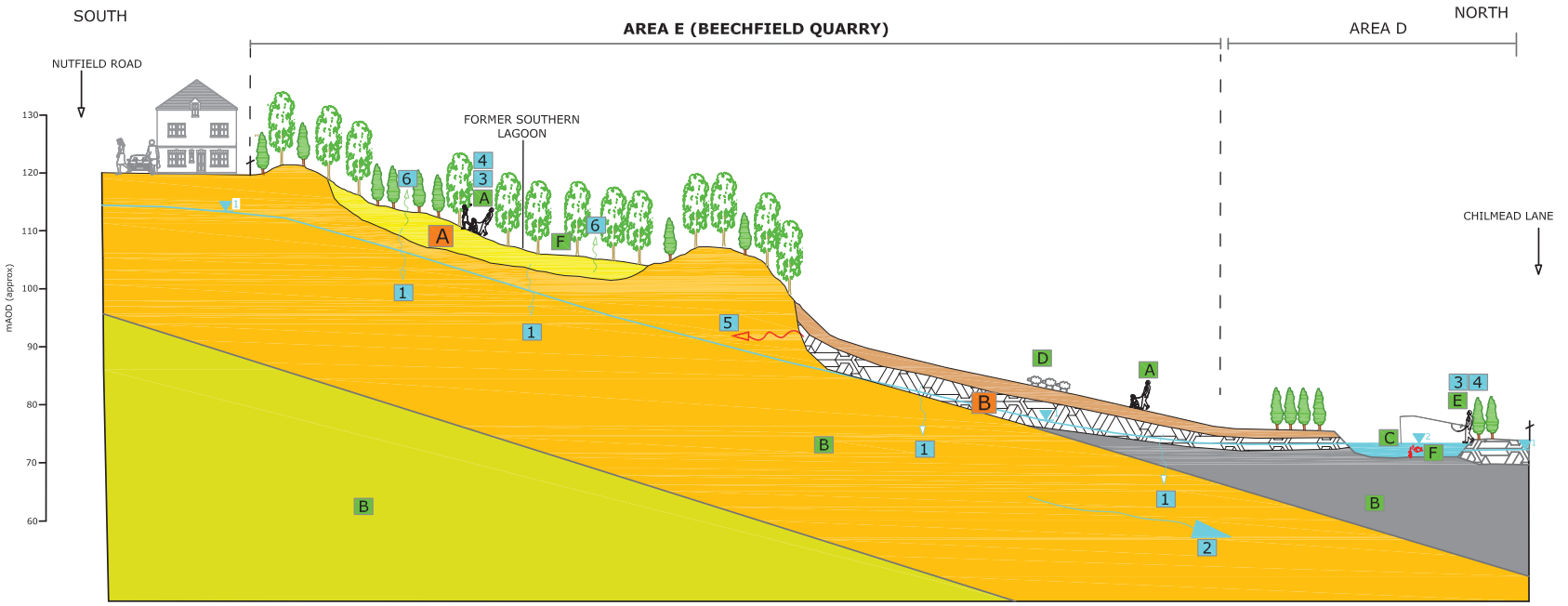
JOB TITLE

FORMER LANDFILL & QUARRIES, REDHILL, SURREY

DRAWING TITLE

CONCEPTUAL SITE MODEL - BEECHFIELD QUARRY (E-W SECTIONS)

STATUS		
FINAL		
DRAWN BY: AJA	SIGNATURE:	DATE: 29/05/2013
APPROVED: KL	SIGNATURE:	DATE: 29/05/2013
SCALE: NOT_TO_SCALE	DRG No.: 20096-E-13A	



KEY

SOURCES		PATHWAYS		RECEPTORS	
RESTORATION SOILS/CAP	A LAGOON SILTS - Arsenic, SO4	1 LEACHING/MIGRATION TO GROUNDWATER		A SITE USERS (Walkers/cyclists)	
WASTE	B WASTES	2 GROUNDWATER MIGRATION		B CONTROLLED WATERS (Sandgate Beds Secondary 'A' and Folkestone/Hythe Beds Principal Aqulfers)	
MADE GROUND (Reworked Natural)	C MADE GROUND: - Reworked natural strata (Arsenic, BaP)	3 INJESTION/DERMAL CONTACT		C CONTROLLED WATERS (Surface Waters - Angling Ponds and Country Park)	
MADE GROUND (Yellow Lagoon Silt)		4 INHALATION		D LIVESTOCK	
FOLKESTONE BEDS		5 HAZARDOUS GAS MIGRATION		E SITE USERS (Anglers)	
SANDGATE BEDS		6 VEGETATION UPTAKE		F AQUATIC/WOODLAND ECOSYSTEMS	
HYTHE BEDS					
1 GROUNDWATER					
2 SURFACE WATER					

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CLIENT

EVONIK DEGUSSA UK HOLDINGS LTD

JOB TITLE

FORMER LANDFILL & QUARRIES, REDHILL, SURREY

DRAWING TITLE

CONCEPTUAL SITE MODEL - BEECHFIELD QUARRY (N-S SECTION)

STATUS: FINAL

DRAWN BY	SIGNATURE	DATE
AJA		29/05/2013

APPROVED	SIGNATURE	DATE
KL		29/05/2013

SCALE	DRG No.
NOT_TO_SCALE	20096-E-13B

APPENDIX E2

APPENDIX B

Photographic Survey

APPENDIX B
PHOTOGRAPHIC SURVEY

Photograph E1 – View looking east along the southern edge of Beechfield Quarry

Photograph E2 – Relic pipework adjacent to footpath at south-western edge of Beechfield Quarry

Photograph E3 – Footpath through woodland in southeast of Beechfield Quarry area.

Photograph E4 – View looking northeast across the wooded depression in central parts of the Beechfield Quarry area

Photograph E5 – View looking northeast (from the North Cockley Landfill (Area B)) towards the open grassland areas surrounding the north and eastern edges of the Beechfield Quarry area in the distance.

APPENDIX C

Aerial Photographs (1945-2009)

APPENDIX C
AERIAL PHOTOGRAPHS

2009 Google Earth™ Aerial Image

2006 Google Earth™ Aerial Image

2003 Google Earth™ Aerial Image

2000/2001 Google Earth™ Aerial Image

1999 Google Earth™ Aerial Image

1945 Google Earth™ Aerial Image

APPENDIX D

Exploratory Hole Records (Beechfield Quarry)

Window Sample Boreholes WS20-WS22, WS24-WS25, WS213-WS229, HA201-HA202

WINDOW SAMPLE LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill

Start date 28/09/2011 Co-ords

End date 28/09/2011 Ground Level

WS20

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.20				MADE GROUND: Brown sandy gravelly topsoil with rootlets (MADE GROUND)	0.10			
					MADE GROUND: Very stiff (hard) dark brown sandy clay with much angular fine to medium gravel of chalk and flint. (MADE GROUND)	0.80			
					MADE GROUND: Light grey and reddish brown slightly sandy angular fine to coarse gravel and cobbles of brick and concrete. (MADE GROUND)	1.10			
					MADE GROUND: Firm light grey and brown mottled slightly sandy clay with rare angular fine to coarse gravel of brick and flint. (MADE GROUND)				
					End of borehole at 2.00 m	2.00			

Remarks

No groundwater encountered

Equipment/Methods

Dando Terrier 2000 rig. Borehole advanced using percussive methods using 120-90mm diameter sample tubes

Logged by	JOB	FIGURE
AJA	20096	

WINDOW SAMPLE LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill

Start date 28/09/2011 Co-ords

End date 28/09/2011 Ground Level

WS21

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
					MADE GROUND: Brown sandy topsoil with rootlets (MADE GROUND)	0.10			
001D	0.30				MADE GROUND: Very stiff (hard) brown and dark grey sandy clay with much angular to subrounded fine to medium gravel of chalk and flint. (MADE GROUND)				
					MADE GROUND: Firm dark grey slightly sandy clay with much angular fine to coarse gravel of brick, sandstone and flint. Locally becoming soft at 2.5-2.8m (MADE GROUND)	0.90			
002D	1.50								
					End of borehole at 3.00 m	3.00			

Remarks

No groundwater encountered

Equipment/Methods	Logged by	JOB	FIGURE
Dando Terrier 2000 rig. Borehole advanced using percussive methods using 120-90mm diameter sample tubes	AJA	20096	

WINDOW SAMPLE LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill

Start date 28/09/2011 Co-ords

End date 28/09/2011 Ground Level

WS22

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.20				MADE GROUND: Dark brown sandy clayey topsoil with rootlets. (MADE GROUND)				
					MADE GROUND: Stiff brown slightly sandy clay with rare subrounded fine to medium gravel. (MADE GROUND)	0.30			
					MADE GROUND: Dark grey clayey slightly sandy angular fine to coarse gravel of flint and chalk. (MADE GROUND)	0.60			
					MADE GROUND: Soft very dark grey sandy clay with rare fragments of brick. Slight organic odour. (WASTE) (MADE GROUND)	1.30			
					End of borehole at 2.00 m	2.00			

Remarks

No groundwater encountered

Equipment/Methods	Logged by	JOB	FIGURE
Dando Terrier 2000 rig. Borehole advanced using percussive methods using 120-90mm diameter sample tubes	AJA	20096	

WINDOW SAMPLE LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill

Start date 28/09/2011 Co-ords

End date 28/09/2011 Ground Level

WS24

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
					MADE GROUND: Dark brown sandy topsoil with rootlets. (MADE GROUND)				
001D	0.30				MADE GROUND: Very stiff brown, locally light brown, very sandy clay with much subangular to subrounded fine to medium gravel of chalk and flint and rare brick fragments. Between 0.5-0.55m - Brown fine to medium sand (MADE GROUND)	0.20			
					MADE GROUND: Dark grey and light grey clayey fine to medium sand. (Possible natural alluvial deposits) (MADE GROUND)	0.90			
002D	1.50				*End of borehole at 2.00 m*	2.00			

Remarks

No groundwater encountered

Equipment/Methods	Logged by	JOB	FIGURE
Dando Terrier 2000 rig. Borehole advanced using percussive methods using 120-90mm diameter sample tubes	AJA	20096	

WINDOW SAMPLE LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill

Start date 28/09/2011 Co-ords

End date 28/09/2011 Ground Level

WS25

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.40				MADE GROUND: Brown sandy topsoil with rootlets. (MADE GROUND)				
					MADE GROUND: Very stiff brown very sandy clay. (MADE GROUND)	0.20			
					MADE GROUND: Dark grey clayey sandy angular fine to coarse gravel of brick, mudstone, sandstone and rare fragments of plastic. (WASTE) (MADE GROUND)	0.80			
					End of borehole at 2.00 m	2.00			

Remarks

No groundwater encountered

Equipment/Methods

Dando Terrier 2000 rig. Borehole advanced using percussive methods using 120-90mm diameter sample tubes

Logged by	JOB	FIGURE
AJA	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	22/02/2012	Co-ords	530482.00 150655.00
End date	22/02/2012	Ground Level	124.20mAOD

WS213

Sheet 1 of 2

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
					MADE GROUND: Dark brown sandy clay with roots (MADE GROUND)	0.05	124.15		
001D	0.25				MADE GROUND: Pale grey mottled dark grey brown sandy clay with some fine to coarse subrounded subangular gravel of sandstone, brick and clinker with some cobbles of brick and flint and occasional pieces of hessian (MADE GROUND)				
002D	1.80								
					MADE GROUND: Grey brown mottled dark grey and brown sandy clay with some fine to coarse subangular gravel and cobbles of brick and sandstone and occasional piece of metal (MADE GROUND)	3.00	121.20		
					Continued on next sheet				

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	22/02/2012	Co-ords	530482.00 150655.00
End date	22/02/2012	Ground Level	124.20mAOD

WS213

Sheet 2 of 2

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
					MADE GROUND: Grey brown mottled dark grey and brown sandy clay with some fine to coarse subangular gravel and cobbles of brick and sandstone and occasional piece of metal (MADE GROUND)				
						4.50	119.70		
003D	4.70				Pale grey mottled brown silty CLAY with occasional gravel sized nodules of hard grey clay (CLAY)				
					End of borehole at 5.00 m	5.00	119.20		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530528.00 150717.00
End date	23/02/2012	Ground Level	123.20mAOD

WS214

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.10				MADE GROUND: Brown very sandy clay with some fine to coarse subrounded to subangular gravel and cobbles of sandstone (MADE GROUND)				
						0.40	122.80		
002D	0.50				MADE GROUND: Grey brown mottled white and orange brown sandy clay with much fine to coarse subangular gravel of flint and sandstone (MADE GROUND)				
						1.20	122.00		
003D	1.50				Dense pale brown mottled grey clayey SAND with some fine to coarse subrounded to subangular gravel of sandstone and flint (SANDS)				
					End of borehole at 2.00 m	2.00	121.20		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530514.00 150835.00
End date	23/02/2012	Ground Level	118.30mAOD

WS215

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.10				MADE GROUND: Greyish brown mottled orange brown sandy clay (MADE GROUND)	0.20	118.10		
002D	0.40				MADE GROUND: Soft yellow brown silty clay (MADE GROUND)				
					End of borehole at 2.00 m	2.00	116.30		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530508.00 150973.00
End date	23/02/2012	Ground Level	105.50mAOD

WS216

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.10				MADE GROUND: Brown sandy clay with occasional fine to coarse subangular gravel of sandstone (MADE GROUND)				
					MADE GROUND: Coarse angular gravel and cobbles of brick, breezeblock and sandstone (MADE GROUND) piece of hessian and large piece of wood at 1.0m	0.80	104.70		
					MADE GROUND: Soft yellowish orange brown laminated silty clay (MADE GROUND)	1.10	104.40		
					End of borehole at 2.00 m	2.00	103.50		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530383.00 150044.00
End date	23/02/2012	Ground Level	106.50mAOD

WS217

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.10				Brown mottled grey sandy clay with occasional fine to coarse subrounded to subangular gravel of sandstone (CLAY)				
					becoming greenish below 1.5m				
					End of borehole at 2.00 m	2.00	104.50		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530496.00 151126.00
End date	23/02/2012	Ground Level	108.25mAOD

WS218

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.10				MADE GROUND: Brown mottled grey sandy clay with occasional fine to coarse subrounded to subangular gravel of sandstone (MADE GROUND)				
						0.40	107.85		
002D	0.60				MADE GROUND: Black mottled grey silt with some fine to coarse subrounded to subangular gravel of brick and sandstone and occasional piece of plastic and wood (MADE GROUND)				
003D	2.50								
					End of borehole at 3.00 m	3.00	105.25		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530480.00 151232.00
End date	23/02/2012	Ground Level	105.70mAOD

WS219

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.10				MADE GROUND: Brown sandy clay with occasional fine to coarse subrounded to subangular gravel of sandstone (MADE GROUND)				
					MADE GROUND: Coarse sandy cobbles of brick and sandstone and a large piece of timber (MADE GROUND)	0.75	104.95		
					Brown mottled greenish grey brown sandy CLAY (CLAY)	0.90	104.80		
					End of borehole at 2.00 m	2.00	103.70		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530357.00 151186.00
End date	23/02/2012	Ground Level	101.00mAOD

WS220

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.10				Dark brown sandy clay with some fine to coarse subrounded to subangular gravel of sandstone and roots (TOPSOIL)				
						0.25	100.75		
002D	0.50				Orange brown mottled dark grey sandy CLAY with some fine to coarse subrounded to subangular gravel of sandstone (CLAY)				
					becoming orange brown below 0.75m				
					becoming grey brown below 0.95m				
					becoming very sandy with much grey sandstone gravel below 1.7m (possible weathered bedrock)				
					End of borehole at 2.00 m	2.00	99.00		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530409.00 151124.00
End date	23/02/2012	Ground Level	104.90mAOD

WS221

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
					Dark brown sandy clay with some fine to coarse subrounded to subangular gravel of sandstone and roots (TOPSOIL)	0.10	104.80		
					Brown sandy CLAY with some fine to coarse subrounded to subangular gravel of sandstone (CLAY)				
					End of borehole at 1.00 m	1.00	103.90		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530456.00 151133.00
End date	23/02/2012	Ground Level	105.90mAOD

WS222

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.10				MADE GROUND: Dark brown sandy clay with occasional fine to coarse subrounded to subangular gravel of sandstone (MADE GROUND)	0.20	105.70		
002D	0.40				MADE GROUND: Brown mottled grey and green sandy clay with occasional fine to coarse subrounded to subangular gravel of sandstone (MADE GROUND)	0.80	105.10		
003D	1.20				MADE GROUND: Black silt with some fine to coarse subrounded to subangular gravel of flint, brick and sandstone and occasional piece of cardbosrd, plastic and wood (MADE GROUND)	2.20	103.70		
004D	2.40				Pale grey mottled brown sandy CLAY with occasional fine to coarse subrounded to subangular gravel and cobbles of sandstone (CLAY)	3.00	102.90		
					End of borehole at 3.00 m				

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530440.00 150889.00
End date	23/02/2012	Ground Level	113.50mAOD

WS223

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.05				MADE GROUND: Brown sandy clay with occasional fine to coarse subangular gravel of flint (MADE GROUND)				
002D	0.80				cobble of breeze-block at 0.75m				
					Brown mottled grey sandy CLAY with occasional fine to coarse subrounded to subangular gravel of sandstone (CLAY)	0.95	112.55		
003D	1.50				*End of borehole at 2.00 m*	2.00	111.50		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530323.00 150908.00
End date	23/02/2012	Ground Level	110.00mAOD

WS224

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.10				Brown sandy CLAY with occasional fine to coarse subrounded to subangular gravel of sandstone and gravel sized nodules of hard grey clay (CLAY)				
					becoming grenish brown mottled black below 2.4m				
					End of borehole at 3.00 m	3.00	107.00		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530246.00 150815.00
End date	23/02/2012	Ground Level	109.90mAOD

WS225

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.10				Brown sandy CLAY with occasional fine to coarse subrounded to subangular gravel of sandstone and gravel sized nodules of hard grey clay (CLAY)				
002D	0.50				no hard grey nodules of clay below 0.9m				
					End of borehole at 3.00 m	3.00	106.90		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530258.00 150680.00
End date	23/02/2012	Ground Level	115.50mAOD

WS226

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.10				Brown sandy CLAY with occasional fine to coarse subrounded to subangular gravel of sandstone (CLAY)				
002D	0.50								
					End of borehole at 2.00 m	2.00	113.50		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530314.00 150716.00
End date	23/02/2012	Ground Level	114.50mAOD

WS227

Sheet 1 of 2

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.20				MADE GROUND: Soft yellowish orange occasionally laminated clay (MADE GROUND)				
					Continued on next sheet				

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill

WS227

Start date 23/02/2012 Co-ords 530314.00 150716.00

Sheet 2 of 2

End date 23/02/2012 Ground Level 114.50mAOD

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
					MADE GROUND: Soft yellowish orange occasionally laminated clay (MADE GROUND)				
						4.60	109.90		
002D	4.80				Pale greenish grey SAND with very much fine to coarse subangular gravel of sandstone (possible weathered bedrock) (SANDS)				
					End of borehole at 5.00 m	5.00	109.50		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530361.00 150656.00
End date	23/02/2012	Ground Level	119.00mAOD

WS228

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.10				Brown sandy CLAY with occasional fine to coarse subrounded to subangular gravel of sandstone (CLAY)				
002D	1.30								
					End of borehole at 2.00 m	2.00	117.00		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	23/02/2012	Co-ords	530452.00 150729.00
End date	23/02/2012	Ground Level	123.00mAOD

WS229

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.05				MADE GROUND: Brown mottled orange brown and black sandy clay with occasional fine to coarse subrounded to subangular gravel of sandstone (MADE GROUND)				
					MADE GROUND: Red brown fine to coarse subangular sandy gravel of ash and clinker (MADE GROUND)	0.80	122.20		
002D	1.10				MADE GROUND: Pale grey brown mottled orange brown and black sandy clay with some fine to coarse subangular gravel of ash and clinker (MADE GROUND)	1.80	121.20		
					End of borehole at 2.00 m	2.00	121.00		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Percussively drilled by a Terrier type Windowless Sample drilling rig.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	24/02/2012	Co-ords	530406.00 150828.00
End date	24/02/2012	Ground Level	112.60mAOD

HA201

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.15				MADE GROUND: Soft yellow silty clay (MADE GROUND)				
					End of borehole at 0.50 m	0.50	112.10		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Manually drilled with a hand held auger.	KL	20096	

WINDOW SAMPLE LOG

CLIENT	Evonik Degussa UK Holdings Limited		
SITE	Former Landfills, Nutfield Road, Redhill		
Start date	24/02/2012	Co-ords	530331.00 150838.00
End date	24/02/2012	Ground Level	109.00mAOD

HA202

Sheet 1 of 1

Scale 1:25

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.20				MADE GROUND: Soft yellow silty clay (MADE GROUND)				
					End of borehole at 0.50 m	0.50	108.50		

Remarks

1. No groundwater encountered.

Equipment/Methods	Logged by	JOB	FIGURE
Manually drilled with a hand held auger.	KL	20096	

APPENDIX E

Exploratory Hole Records (Beechfield Quarry)

Boreholes BH10 – BH13

BOREHOLE LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill

BH10

Start date 26/09/2011

Co-ords 530233 150941

Sheet 1 of 2

End date 26/09/2011

Ground Level 105.30mAOD

Scale 1:50

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
					MADE GROUND: Brown clayey sandy gravel with cobbles of brick. Gravel is fine to coarse, angular of brick and sandstone. (MADE GROUND)				
001D	1.00								
					MADE GROUND: Concrete. (MADE GROUND)	1.10	104.20		
					MADE GROUND: Firm grey gravelly clay with wire and timber fragments. (MADE GROUND)	1.40	103.90		
002D	2.00								
					Stiff brown gravelly silty CLAY. Gravel is fine to coarse, angular of sandstone. (NATURAL)	3.30	102.00		
003D	3.50								
					Brown silty fine to medium SAND with clay bands. (NATURAL) *Continued on next sheet*	7.50	97.80		

Remarks

No groundwater encountered.
Water added to assist boring

Equipment/Methods	Logged by	JOB	FIGURE
Cable tool percussion boring using 150mm diameter casings	AB	20096	

BOREHOLE LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill

BH10

Start date 26/09/2011

End date 26/09/2011

Co-ords 530233 150941

Ground Level 105.30mAOD

Sheet 2 of 2

Scale 1:50

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
004D	8.00				Brown silty fine to medium SAND with clay bands. (NATURAL)				
					Grey weathered medium SANDSTONE, moderelay weak (NATURAL)	9.30	96.00		
005D	10.00				*End of borehole at 10.50 m*	10.50	94.80		

Remarks

No groundwater encountered.
Water added to assist boring

Equipment/Methods	Logged by	JOB	FIGURE
Cable tool percussion boring using 150mm diameter casings	AB	20096	

BOREHOLE LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill

BH11

Start date 27/09/2011

End date 27/09/2011

Co-ords 530440 150953

Ground Level 110.70mAOD

Sheet 1 of 2

Scale 1:50

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.50				MADE GROUND: Grass onto brown clayey silty slightly gravelly sand. Gravel is fine to coarse, angular of sandstone and brick (Topsoil). (MADE GROUND)				
						1.00	109.70		
002	1.50				MADE GROUND: Soft brown mottled grey ashy slightly sandy gravelly clay. Gravel is fine to coarse, angular of brick, clinker, quartz and concrete. (MADE GROUND)				
						1.80	108.90		
			N=16		Medium dense brown slightly clayey silty fine to medium SAND (NATURAL)				
003D	2.50								
004D	3.50		N=19						
			N=25						
					Continued on next sheet				

Remarks

No groundwater encountered.
Water added to assist boring

Equipment/Methods	Logged by	JOB	FIGURE
Cable tool percussion boring using 150mm diameter casings	AB	20096	

BOREHOLE LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill

BH11

Start date 27/09/2011

End date 27/09/2011

Co-ords 530440 150953

Ground Level 110.70mAOD

Sheet 2 of 2

Scale 1:50

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
					Medium dense brown slightly clayey silty fine to medium SAND (NATURAL)				
005D	9.00				Grey weathered silty MUDSTONE (NATURAL)	8.80	101.90		
					End of borehole at 11.00 m	11.00	99.70		

Remarks

No groundwater encountered.
Water added to assist boring

Equipment/Methods	Logged by	JOB	FIGURE
Cable tool percussion boring using 150mm diameter casings	AB	20096	

BOREHOLE LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill

BH12

Start date 27/09/2011

End date 27/09/2011

Co-ords 530125 151141

Ground Level 91.55mAOD

Sheet 1 of 2

Scale 1:50

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
001D	0.50				MADE GROUND: Grass onto soft brown very gravelly silty sandy clay. Gravel is fine to coarse, angular of brick, concrete and mudstone. (MADE GROUND)				
						1.00	90.55		
					MADE GROUND: Soft grey gravelly clay with cobbles of concrete. Gravel is fine to coarse, angular of mudstone. (MADE GROUND)				
002D	2.00								
			N=22			3.90	87.65		
003D	4.50				Medium dense to dense greenish grey silty fine to medium SAND with bands of weakly cemented sandstone. (NATURAL)				
			N=33						
			N=29						
					Continued on next sheet				

Remarks

No groundwater encountered.
Water added to assist boring

Equipment/Methods	Logged by	JOB	FIGURE
Cable tool percussion boring using 150mm diameter casings	AB	20096	

BOREHOLE LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill

BH12

Start date 27/09/2011

Co-ords 530125 151141

Sheet 2 of 2

End date 27/09/2011

Ground Level 91.55mAOD

Scale 1:50

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
004D	8.00				Medium dense to dense greenish grey silty fine to medium SAND with bands of weakly cemented sandstone. (NATURAL)				
					Greenish grey weathered medium SANDSTONE, very weak (NATURAL)	9.00	82.55		
005D	11.00				Greenish grey weathered medium SANDSTONE, moderately strong (NATURAL)	11.10	80.45		
					End of borehole at 11.30 m	11.30	80.25		

Remarks

No groundwater encountered.
Water added to assist boring

Equipment/Methods	Logged by	JOB	FIGURE
Cable tool percussion boring using 150mm diameter casings	AB	20096	

BOREHOLE LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill

BH13

Start date 27/09/2011

End date 27/09/2011

Co-ords 530308 151243

Ground Level 94.20mAOD

Sheet 1 of 1

Scale 1:50

Sample no & type	Sample depth (m)	Casing depth (m)	U100 SPT & N value	Well / backfill details	Description	Depth (m)	Reduced level (m)	Ground-water	Legend
					MADE GROUND: Brown slightly gravelly silty fine to medium sand with rootlets. Gravel is fine to medium, angular of chalk and flint. (Topsoil) (MADE GROUND)	0.10	94.10		
001D	0.50								
					MADE GROUND: Grey angular (weak) fine to coarse gravel of mudstone. (MADE GROUND)	1.00	93.20		
002D	1.00								
					MADE GROUND: Grey gravelly silty fine to medium sand. Gravel is fine to coarse, angular of brick, chalk and flint. (MADE GROUND)	1.30	92.90		
003D	1.50								
					Brown gravelly slightly silty fine to medium SAND. Gravel is fine to coarse, angular of sandstone. (NATURAL)	1.90	92.30		
004D	2.00		N=14						
					Medium dense orange brown slightly silty fine to medium SAND. (NATURAL)				
005D	3.00								
			50/70mm			3.50	90.70		
					Orange brown weathered medium SANDSTONE, moderately weak (NATURAL)	3.60	90.60		
					End of borehole at 3.60 m				

Remarks

No groundwater encountered.
Water added to assist boring

Equipment/Methods	Logged by	JOB	FIGURE
Cable tool percussion boring using 150mm diameter casings	AB	20096	

APPENDIX F

Exploratory Hole Records (Beechfield Area)

Trial Pits TP15

TRIAL PIT LOG

CLIENT Evonik Degussa UK Holdings Limited

SITE Former Landfills, Nutfield Road, Redhill Co-ords

TP15

Sheet 1 of 1

DATE 06/10/2011 Ground Level

Scale 1:25

sample no & type	depth (m)	in-situ test	description	depth (m)	level (m)	ground water	legend
001D	0.20		MADE GROUND: Grass onto brown slightly silty sand with rootlets (TOPSOIL). (MADE GROUND)	0.30			
002D	0.50		MADE GROUND: Stiff grey sandy gravelly clay. Gravel is fine to coarse, angular of brick, sandstone and flint. (MADE GROUND)	0.80			
			MADE GROUND: Grey ashy gravelly fine to coarse sand with cobbles of reinforced concrete. Gravel is fine to coarse, angular of clinker and concrete. Rare plastic, timber, rubber and polythene fragments. encountered. (MADE GROUND)	0.90			
003D	1.50		Stiff greenish brown sandy gravelly CLAY (NATURAL)	1.80			
			Greenish grey clayey fine to medium SAND (NATURAL)	2.30			
			Orange brown silty fine to medium SAND (NATURAL)	2.60			
			End of trial pit at 2.60 m				

Remarks

Trial Pit Stable
No groundwater encountered

Equipment/Methods
Excavated using JCB 3CX backhoe excavator with 0.6m wide toothed bucket. No support used.

Logged by: AB

JOB: 20096

FIGURE

APPENDIX G

Summary of Groundwater Level Measurements

(October 2011 – March 2013)

Appendix G
Former Landfills, Nutfield Road, Redhill, Surrey
Summary of Groundwater Level Measurements

Borehole	BH Level mAOD	Date															min	max	mean
		03/10/2011	06/10/2011	24/10/2011	09/11/2011	21/11/2011	05/12/2011	21/02/2012	02/04/2012	02/05/2013	29/05/2012	02/07/2012	01/08/2012	10/09/2012	11/12/2012	12/03/2013			
BH1	126.4	5.23	5.30	5.50	5.10	5.22	5.20	4.70	5.00	2.90	4.90	4.95	4.58	4.96	3.15	4.90	2.90	5.50	4.77
BH2	125.35	Dry	Dry	Dry	Dry	Dry	Dry	Dry	DRY	DRY	Dry	Dry	Dry	Dry	Dry	Dry			
BH3	108.95	9.22	9.34	9.30	9.30	9.22	9.24	9.50	9.27	9.20	9.20	9.18	9.07	9.22	9.95	9.50	9.07	9.95	9.31
BH4	95.85	4.91	5.10	4.30	4.70	5.25	5.28	3.60	3.17	3.00	2.95	3.05	2.00	2.48	1.76	1.45	1.45	5.28	3.53
BH5	123.75	Dry	Dry	Dry	Dry	Dry	Dry	6.00	DRY	5.95	Dry	Dry	Dry	Dry	Dry	DRY	5.95	6.00	5.98
BH6	118.75	7.97	8.11	7.70	7.25	7.45	7.45	7.40	6.90	6.90	6.70	7.10	5.12	5.35	4.60	5.05	4.60	8.11	6.74
BH7A	114.95	7.48	7.48	7.50	7.60	7.62	7.57	7.80	7.60	7.80	7.70	7.50	7.20	7.42	6.70	6.50	6.50	7.80	7.43
BH8	117.45	Dry	Dry	Dry	Dry	Dry	Dry	Dry	3.60	3.50	3.55	Dry	Dry	Dry	3.75	3.8	3.50	3.80	3.64
BH9	110.3	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	5.05	4.98	4.98	5.05	5.02
BH10	105.3	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	2.35	Dry	Dry	Dry	NR	Dry	NR	2.35	2.35	2.35
BH11	110.7	5.04	5.07	5.20	5.25	5.25	5.26	2.85	2.60	2.20	2.20	2.35	2.03	NR	1.98	NR	1.98	5.26	3.64
BH12	91.55	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	NR	0.61	NR	0.61	0.61	0.61
BH13	94.2	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	NR	Dry	NR			
BH14	118.2	3.65	3.66	3.70	3.75	3.76	3.80	3.40	3.30	3.30	3.40	3.50	3.35	3.62	3.70	3.60	3.30	3.80	3.57
BH15A	88.3	2.86	2.88	2.90	2.36	2.90	2.85	2.10	2.40	1.80	2.45	2.80	2.38	2.95	2.15	2.35	1.80	2.95	2.54
BH16D	84.15	11.79	12.18	12.50	12.45	12.50	12.50	12.70	DRY	12.70	12.10	12.70	11.53	11.05	10.92	6.25	6.25	12.70	11.71
BH16S	84.15	5.27	5.36	5.50	5.50	5.54	5.60	5.33	5.10	5.00	4.70	4.90	3.95	6.50	6.50	3.55	3.55	6.50	5.22
BH17D	85.05	7.54	8.40	6.30	7.30	8.30	8.25	7.20	7.40	6.45	5.90	7.65	5.36	5.36	5.01	5.10	5.01	8.40	6.77
BH17S	85.08	4.97	Dry	5.00	Dry	4.95	4.85	Dry	Dry	Dry	Dry	4.35	Dry	Dry	4.43	5.10	4.35	5.10	4.81
BH18	85.55	Dry	Dry	Dry	Dry	Dry	Dry	Dry	4.90	4.80	4.80	Dry	4.60	4.85	4.63	4.80	4.60	4.90	4.77
BH19	82.6	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	5.18	5.95	5.85	4.70	4.70	5.95	5.42
BH20	84.2	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry			
BH21	113.4	Dry	Dry	Dry	Dry	Dry	Dry	1.50	2.80	0.70	2.90	Dry	2.81	Dry	1.23	1.50	0.70	2.90	1.92
BH22	122.3	Dry	Dry	Dry	Dry	Dry	Dry	Dry	DRY	6.50	Dry	Dry	6.47	Dry	6.80	6.70	6.47	6.80	6.62
BH23	88.2	Dry	Dry	Dry	Dry	Dry	Dry	Dry	DRY	DRY	Dry	Dry	Dry	Dry	Dry	6.00	6.00	6.00	6.00
BH24	88.15	5.69	5.70	5.90	5.90	5.91	5.80	6.30	6.30	6.45	6.05	5.90	5.50	5.60	4.97	4.18	4.18	6.45	5.74
BH25	92.95	Dry	Dry	5.50	Dry	5.57	5.60	5.50	Dry	Dry	Dry	5.6	Dry	NR	Dry	NR	5.50	5.60	5.55
BH26	102.2	3.66	3.66	3.20	2.70	3.36	3.40	3.20	3.10	3.30	3.35	3.30	3.08	NR	3.22	NR	2.70	3.66	3.27
BH27	117.8	NR	NR	6.90	6.95	Dry	Dry	6.70	6.60	6.40	6.30	6.90	6.13	NR	6.10	NR	6.10	6.95	6.55
BH28	121.3	Dry	Dry	Dry	Dry	Dry	Dry	9.50	9.50	9.20	9.20	9.25	9.20	NR	9.55	NR	9.20	9.55	9.34
BH29	118.85	Dry	Dry	Dry	Dry	Dry	Dry	Dry	DRY	7.15	6.10	Dry	5.75	NR	5.52	6.52	5.52	7.15	6.21
BH30	112.9	5.00	Dry	4.80	4.75	4.75	4.65	3.40	3.70	3.30	3.65	3.45	3.63	3.95	3.05	3.15	3.05	5.00	3.95
BH31	96.05	5.29	5.4	5.30	5.40	5.32	5.30	5.05	5.00	5.15	5.00	5.20	4.49	4.65	4.45	3.90	3.90	5.40	4.99

Measurements equate to depth to standing groundwater level (mbg)
NR = Not recorded

APPENDIX H

Statistical Analysis of Soil Chemical Test Results
Beechfield Quarry

Encia Job No.	20096/6E
Site Name	Beechfield Quarry (AREA E)
Engineer	KL

Analytical Data			Mean Value Test			Outlier Test	
Material Type	Data (mg/kg)	Log Data	n	t	t value	T_{crit} 10%	T_{crit} V
MG: Sandy Clay (Woodland)	11.00	1.0414	2	6.3138			
	13.00	1.1139	3	2.9200			
	42.00	1.6232	4	2.3534		1.425	
	16.00	1.2041	5	2.1318		1.602	
	51.00	1.7076	6	2.0150		1.729	
	21.00	1.3222	7	1.9432		1.828	
	16.00	1.2041	8	1.8946		1.909	
	12.00	1.0792	9	1.8595		1.977	
	20.00	1.3010	10	1.8331		2.036	
	42.00	1.6232	11	1.8125		2.088	
	24.00	1.3802	12	1.7959	1.796	2.134	2.134
	40.00	1.6021	13	1.7823		2.176	
			14	1.7709		2.213	
			15	1.7613		2.248	
			16	1.7531		2.279	
			17	1.7459		2.309	
			18	1.7396		2.336	
			19	1.7341		2.361	
			20	1.7291		2.385	
			21	1.7247		2.408	
			22	1.7207		2.429	
			23	1.7171		2.449	
			24	1.7139		2.468	
			25	1.7109		2.486	
			26	1.7081		2.503	
			27	1.7056		2.520	
			28	1.7033		2.536	
			29	1.7011		2.551	
			30	1.6991		2.565	
			31	1.6973		2.579	
			32	1.6955		2.592	
			33	1.6939		2.605	
			34	1.6924		2.618	
			35	1.6909		2.630	
			36	1.6896		2.641	
			37	1.6883		2.652	
			38	1.6871		2.663	
			39	1.6860		2.674	
			40	1.6849		2.684	
			41	1.6839		2.694	
			42	1.6829		2.704	
			43	1.6820		2.713	
			44	1.6811		2.722	
			45	1.6802		2.731	
			46	1.6794		2.739	
			47	1.6787		2.748	
			48	1.6779		2.756	
			49	1.6772		2.764	
			50	1.6766		2.772	

Determinand:	Arsenic in MG:Sandy Clay (Woodland)

No. of samples:	12
SGV:	32.0

t value:	1.796
mean (x):	25.67
st.dev (s):	14.10
95% ile:	**32.98**

Is the Mean Value Test Higher or Lower than the SGV?	
Higher or Lower	Higher

Y max:	1.708
Y mean:	1.350
Y st.dev.:	0.236
T value	1.516
Comparator	2.134

Maximum Value Test Result:	
Outlier Test?	Maximum is within a Normal Distribution

Outlier Values	Sample Number

Encia Job No.	20096/6E
Site Name	Beechfield Quarry (AREA E)
Engineer	KL

Analytical Data			Mean Value Test			Outlier Test	
Material Type	Data (mg/kg)	Log Data	n	t	t value	T_{crit} 10%	T_{crit} V
MG: Yellow Clay (Woodland)	18.00	1.2553	2	6.3138			
	35.00	1.5441	3	2.9200			
	43.00	1.6335	4	2.3534	2.353	1.425	1.425
	44.00	1.6435	5	2.1318		1.602	
			6	2.0150		1.729	
			7	1.9432		1.828	
			8	1.8946		1.909	
			9	1.8595		1.977	
			10	1.8331		2.036	
			11	1.8125		2.088	
			12	1.7959		2.134	
			13	1.7823		2.176	
			14	1.7709		2.213	
			15	1.7613		2.248	
			16	1.7531		2.279	
			17	1.7459		2.309	
			18	1.7396		2.336	
			19	1.7341		2.361	
			20	1.7291		2.385	
			21	1.7247		2.408	
			22	1.7207		2.429	
			23	1.7171		2.449	
			24	1.7139		2.468	
			25	1.7109		2.486	
			26	1.7081		2.503	
			27	1.7056		2.520	
			28	1.7033		2.536	
			29	1.7011		2.551	
			30	1.6991		2.565	
			31	1.6973		2.579	
			32	1.6955		2.592	
			33	1.6939		2.605	
			34	1.6924		2.618	
			35	1.6909		2.630	
			36	1.6896		2.641	
			37	1.6883		2.652	
			38	1.6871		2.663	
			39	1.6860		2.674	
			40	1.6849		2.684	
			41	1.6839		2.694	
			42	1.6829		2.704	
			43	1.6820		2.713	
			44	1.6811		2.722	
			45	1.6802		2.731	
			46	1.6794		2.739	
			47	1.6787		2.748	
			48	1.6779		2.756	
			49	1.6772		2.764	
			50	1.6766		2.772	

Determinand:	Arsenic in MG: Yellow Clay (Woodland)
No. of samples:	4
SGV:	32.0
t value:	2.353
mean (x):	35.00
st.dev (s):	12.03
95% ile:	49.15

Is the Mean Value Test Higher or Lower than the SGV?	
Higher or Lower	Higher
Y max:	1.643
Y mean:	1.519
Y st.dev.:	0.181
T value	0.686
Comparator	1.425

Maximum Value Test Result:	
Outlier Test?	Maximum is within a Normal Distribution

Outlier Values	Sample Number

Encia Job No.	20096/6E
Site Name	Beechfield Quarry (AREA E)
Engineer	KL

Analytical Data			Mean Value Test			Outlier Test	
Material Type	Data (mg/kg)	Log Data	n	t	t value	T_{crit} 10%	T_{crit} V
MG: Sandy Clay (Woodland)	98.00	1.9912	2	6.3138			
	610.00	2.7853	3	2.9200			
	100.00	2.0000	4	2.3534		1.425	
	130.00	2.1139	5	2.1318		1.602	
	62.00	1.7924	6	2.0150		1.729	
	60.00	1.7782	7	1.9432		1.828	
	32.00	1.5051	8	1.8946		1.909	
	22.00	1.3424	9	1.8595		1.977	
	30.00	1.4771	10	1.8331		2.036	
	98.00	1.9912	11	1.8125	1.812	2.088	2.088
	150.00	2.1761	12	1.7959		2.134	
	81.00	1.9085	13	1.7823		2.176	
			14	1.7709		2.213	
			15	1.7613		2.248	
			16	1.7531		2.279	
			17	1.7459		2.309	
			18	1.7396		2.336	
			19	1.7341		2.361	
			20	1.7291		2.385	
			21	1.7247		2.408	
			22	1.7207		2.429	
			23	1.7171		2.449	
			24	1.7139		2.468	
			25	1.7109		2.486	
			26	1.7081		2.503	
			27	1.7056		2.520	
			28	1.7033		2.536	
			29	1.7011		2.551	
			30	1.6991		2.565	
			31	1.6973		2.579	
			32	1.6955		2.592	
			33	1.6939		2.605	
			34	1.6924		2.618	
			35	1.6909		2.630	
			36	1.6896		2.641	
			37	1.6883		2.652	
			38	1.6871		2.663	
			39	1.6860		2.674	
			40	1.6849		2.684	
			41	1.6839		2.694	
			42	1.6829		2.704	
			43	1.6820		2.713	
			44	1.6811		2.722	
			45	1.6802		2.731	
			46	1.6794		2.739	
			47	1.6787		2.748	
			48	1.6779		2.756	
			49	1.6772		2.764	
			50	1.6766		2.772	

Determinand:	Zinc in MG:Sandy Clay (Woodland)
No. of samples:	11
SGV:	450.0
t value:	1.812
mean (x):	122.75
st.dev (s):	158.49
95% ile:	209.36

Is the Mean Value Test Higher or Lower than the SGV?	
Higher or Lower	Lower
Y max:	2.785
Y mean:	1.905
Y st.dev.:	0.382
T value	2.305
Comparator	2.088

Maximum Value Test Result:	
Outlier Test?	Maximum is an Outlier

Outlier Values	Sample Number

Encia Job No.	20096/6E
Site Name	Beechfield Quarry (AREA E)
Engineer	KL

Analytical Data			Mean Value Test			Outlier Test	
Material Type	Data (mg/kg)	Log Data	n	t	t value	T_{crit} 10%	T_{crit} V
MG: Sandy Clay (Woodland)	98.00	1.9912	2	6.3138			
			3	2.9200			
	100.00	2.0000	4	2.3534		1.425	
	130.00	2.1139	5	2.1318		1.602	
	62.00	1.7924	6	2.0150		1.729	
	60.00	1.7782	7	1.9432		1.828	
	32.00	1.5051	8	1.8946		1.909	
	22.00	1.3424	9	1.8595		1.977	
	30.00	1.4771	10	1.8331		2.036	
	98.00	1.9912	11	1.8125	1.812	2.088	2.088
	150.00	2.1761	12	1.7959		2.134	
	81.00	1.9085	13	1.7823		2.176	
			14	1.7709		2.213	
			15	1.7613		2.248	
			16	1.7531		2.279	
			17	1.7459		2.309	
			18	1.7396		2.336	
			19	1.7341		2.361	
			20	1.7291		2.385	
			21	1.7247		2.408	
			22	1.7207		2.429	
			23	1.7171		2.449	
			24	1.7139		2.468	
			25	1.7109		2.486	
			26	1.7081		2.503	
			27	1.7056		2.520	
			28	1.7033		2.536	
			29	1.7011		2.551	
			30	1.6991		2.565	
			31	1.6973		2.579	
			32	1.6955		2.592	
			33	1.6939		2.605	
			34	1.6924		2.618	
			35	1.6909		2.630	
			36	1.6896		2.641	
			37	1.6883		2.652	
			38	1.6871		2.663	
			39	1.6860		2.674	
			40	1.6849		2.684	
			41	1.6839		2.694	
			42	1.6829		2.704	
			43	1.6820		2.713	
			44	1.6811		2.722	
			45	1.6802		2.731	
			46	1.6794		2.739	
			47	1.6787		2.748	
			48	1.6779		2.756	
			49	1.6772		2.764	
			50	1.6766		2.772	

Determinand:	Zinc in MG:Sandy Clay (Woodland)
No. of samples:	11
SGV:	450.0
t value:	1.812
mean (x):	78.45
st.dev (s):	41.61
95% ile:	101.19

Is the Mean Value Test Higher or Lower than the SGV?	
Higher or Lower	Lower
Y max:	2.176
Y mean:	1.825
Y st.dev.:	0.276
T value	1.274
Comparator	2.088

Maximum Value Test Result:	
Outlier Test?	Maximum is within a Normal Distribution

Outlier Values	Sample Number
610mg/kg	WS213 - 1.8m

Encia Job No.	20096/6E
Site Name	Beechfield Quarry (AREA E)
Engineer	KL

Analytical Data			Mean Value Test			Outlier Test	
Material Type	Data (mg/kg)	Log Data	n	t	t value	T_{crit} 10%	T_{crit} V
Natural Strata	15.0000	1.1761	2	6.3138			
	84.0000	1.9243	3	2.9200			
	44.0000	1.6435	4	2.3534		1.425	
	29.0000	1.4624	5	2.1318		1.602	
	32.0000	1.5051	6	2.0150		1.729	
	20.0000	1.3010	7	1.9432		1.828	
	94.0000	1.9731	8	1.8946		1.909	
	13.0000	1.1139	9	1.8595		1.977	
	43.0000	1.6335	10	1.8331		2.036	
	33.0000	1.5185	11	1.8125		2.088	
	39.0000	1.5911	12	1.7959		2.134	
	38.0000	1.5798	13	1.7823		2.176	
	20.0000	1.3010	14	1.7709		2.213	
	41.0000	1.6128	15	1.7613		2.248	
	60.0000	1.7782	16	1.7531		2.279	
	52.0000	1.7160	17	1.7459		2.309	
	20.0000	1.3010	18	1.7396	1.740	2.336	2.336
	40.0000	1.6021	19	1.7341		2.361	
			20	1.7291		2.385	
			21	1.7247		2.408	
			22	1.7207		2.429	
			23	1.7171		2.449	
			24	1.7139		2.468	
			25	1.7109		2.486	
			26	1.7081		2.503	
			27	1.7056		2.520	
			28	1.7033		2.536	
			29	1.7011		2.551	
			30	1.6991		2.565	
			31	1.6973		2.579	
			32	1.6955		2.592	
			33	1.6939		2.605	
			34	1.6924		2.618	
			35	1.6909		2.630	
			36	1.6896		2.641	
			37	1.6883		2.652	
			38	1.6871		2.663	
			39	1.6860		2.674	
			40	1.6849		2.684	
			41	1.6839		2.694	
			42	1.6829		2.704	
			43	1.6820		2.713	
			44	1.6811		2.722	
			45	1.6802		2.731	
			46	1.6794		2.739	
			47	1.6787		2.748	
			48	1.6779		2.756	
			49	1.6772		2.764	
			50	1.6766		2.772	

Determinand:	**Arsenic in Natural Strata**
No. of samples:	18
SGV:	32.0
t value:	1.740
mean (x):	39.83
st.dev (s):	21.98
95% ile:	**48.85**

Is the Mean Value Test Higher or Lower than the SGV?	
Higher or Lower	**Higher**
Y max:	1.973
Y mean:	1.541
Y st.dev.:	0.236
T value	1.830
Comparator	2.336

Maximum Value Test Result:	
Outlier Test?	**Maximum is within a Normal Distribution**

Outlier Values	Sample Number

Encia Job No.	20096/6E
Site Name	Beechfield Quarry (AREA E)
Engineer	KL

Analytical Data			Mean Value Test			Outlier Test	
Material Type	Data (mg/kg)	Log Data	n	t	t value	T_{crit} 10%	T_{crit} V
MG: Sandy Clay (Woodland)	18.0000	1.2553	2	6.3138			
	2.0000	0.3010	3	2.9200			
	0.3400	-0.4685	4	2.3534		1.425	
	2.7000	0.4314	5	2.1318		1.602	
	0.0058	-2.2366	6	2.0150		1.729	
	0.0400	-1.3979	7	1.9432		1.828	
	0.0250	-1.6021	8	1.8946		1.909	
	0.0730	-1.1367	9	1.8595		1.977	
	0.0250	-1.6021	10	1.8331		2.036	
	0.0640	-1.1938	11	1.8125		2.088	
	1.5000	0.1761	12	1.7959	1.796	2.134	2.134
	0.0470	-1.3279	13	1.7823		2.176	
			14	1.7709		2.213	
			15	1.7613		2.248	
			16	1.7531		2.279	
			17	1.7459		2.309	
			18	1.7396		2.336	
			19	1.7341		2.361	
			20	1.7291		2.385	
			21	1.7247		2.408	
			22	1.7207		2.429	
			23	1.7171		2.449	
			24	1.7139		2.468	
			25	1.7109		2.486	
			26	1.7081		2.503	
			27	1.7056		2.520	
			28	1.7033		2.536	
			29	1.7011		2.551	
			30	1.6991		2.565	
			31	1.6973		2.579	
			32	1.6955		2.592	
			33	1.6939		2.605	
			34	1.6924		2.618	
			35	1.6909		2.630	
			36	1.6896		2.641	
			37	1.6883		2.652	
			38	1.6871		2.663	
			39	1.6860		2.674	
			40	1.6849		2.684	
			41	1.6839		2.694	
			42	1.6829		2.704	
			43	1.6820		2.713	
			44	1.6811		2.722	
			45	1.6802		2.731	
			46	1.6794		2.739	
			47	1.6787		2.748	
			48	1.6779		2.756	
			49	1.6772		2.764	
			50	1.6766		2.772	

Determinand:	BaP in MG:Sandy Clay
No. of samples:	12
SGV:	1.6
t value:	1.796
mean (x):	2.07
st.dev (s):	5.10
95% ile:	4.71

Is the Mean Value Test Higher or Lower than the SGV?	
Higher or Lower	Higher

Y max:	1.255
Y mean:	-0.733
Y st.dev.:	1.054
T value	1.887
Comparator	2.134

Maximum Value Test Result:	
Outlier Test?	Maximum is within a Normal Distribution

Outlier Values	Sample Number

Encia Job No.	20096/6E
Site Name	Beechfield Quarry (AREA E)
Engineer	KL

Analytical Data			Mean Value Test			Outlier Test	
Material Type	Data (mg/kg)	Log Data	n	t	t value	T_{crit} 10%	T_{crit} V
Near Surface Restoration Soils Cap	1.1000	0.0414	2	6.3138			
	0.5600	-0.2518	3	2.9200			
	0.0110	-1.9586	4	2.3534		1.425	
	0.0100	-2.0000	5	2.1318		1.602	
	1.8000	0.2553	6	2.0150		1.729	
	0.1400	-0.8539	7	1.9432		1.828	
	1.7000	0.2304	8	1.8946		1.909	
	1.9000	0.2788	9	1.8595		1.977	
	0.7000	-0.1549	10	1.8331		2.036	
	1.8000	0.2553	11	1.8125	1.812	2.088	2.088
	0.0120	-1.9208	12	1.7959		2.134	
			13	1.7823		2.176	
			14	1.7709		2.213	
			15	1.7613		2.248	
			16	1.7531		2.279	
			17	1.7459		2.309	
			18	1.7396		2.336	
			19	1.7341		2.361	
			20	1.7291		2.385	
			21	1.7247		2.408	
			22	1.7207		2.429	
			23	1.7171		2.449	
			24	1.7139		2.468	
			25	1.7109		2.486	
			26	1.7081		2.503	
			27	1.7056		2.520	
			28	1.7033		2.536	
			29	1.7011		2.551	
			30	1.6991		2.565	
			31	1.6973		2.579	
			32	1.6955		2.592	
			33	1.6939		2.605	
			34	1.6924		2.618	
			35	1.6909		2.630	
			36	1.6896		2.641	
			37	1.6883		2.652	
			38	1.6871		2.663	
			39	1.6860		2.674	
			40	1.6849		2.684	
			41	1.6839		2.694	
			42	1.6829		2.704	
			43	1.6820		2.713	
			44	1.6811		2.722	
			45	1.6802		2.731	
			46	1.6794		2.739	
			47	1.6787		2.748	
			48	1.6779		2.756	
			49	1.6772		2.764	
			50	1.6766		2.772	

Determinand:	BaP in Restoration Soils/Cap
No. of samples:	11
SGV:	1.6
t value:	1.812
mean (x):	0.88
st.dev (s):	0.80
95% ile:	1.32

Is the Mean Value Test Higher or Lower than the SGV?	
Higher or Lower	Lower
Y max:	0.279
Y mean:	-0.553
Y st.dev.:	0.962
T value	0.865
Comparator	2.088

Maximum Value Test Result:	
Outlier Test?	Maximum is within a Normal Distribution

Outlier Values	Sample Number

APPENDIX I

Water Monitoring Report

(Ref: 20096/056 dated 31st January 2013)

Encia Regeneration Limited

20096/056

31st January 2013

Mr Dietrich Mehrhoff
Landplus GmBH
Hedwigstrasse 62
D-45131
Essen
Germany

By Email Only

Dear Dietrich

Evonik Degussa UK Holdings Ltd
Former Landfills, Nutfield Road, Redhill, Surrey

Groundwater Monitoring Report (October 2011 – December 2012)

Further to our proposal ref: 20096/P5/aja/001, dated 30th August 2012, we are pleased to provide our report on the supplementary groundwater monitoring performed at the above site.

Background

An exploratory ground investigation was undertaken by Landplus/Encia at the above site in late 2011. The findings of the exploratory investigation are presented in the following report:

- *"Exploratory Geoenvironmental Appraisal of Former Par, North Cockley and Beechfield Landfills, Nutfield Road, Redhill, Surrey".* Report No. 20096/1, January 2012

The study site can be divided into 6 areas, based on historical land use, as shown on **Drawing No. 20096/2 in Appendix A**, and as summarised below:

- Area A – Former Park Quarry Landfill
- Area B – Former North Cockley Landfill
- Area C – Gore Meadow
- Area D – Former Sand Pit
- Area E – Former Beechfield Quarry Landfill
- Area F – Former Church Hill Quarry Landfill

The above investigation entailed the establishment of 33 No. gas/groundwater monitoring wells across the site supplementary by additional exploratory holes, the locations of which are shown on **Drawing No. 20096/9-REVA in Appendix A**.

The investigation identified predominantly putrescible/degradable wastes within Areas A and B. 'Inert' wastes were indentified across Areas C, D, E and F to generally shallower depths, although in Area F the inert wastes (mainly quarry overburden materials) were observed to greater depths. Across all areas investigated, the putrescible/degradable and inert wastes appeared to be present directly above sand and sandstone strata and possess no 'basal line'r, although all restored landfill areas possess a good covering of clayey restoration soil cover and a geomembrane cap would appear to be present across much of Area B.

Groundwater and surface water sampling/testing was initially carried out on 2 occasions on 2nd-6th October 2011 and 9th-10th November 2011.

Given the environmental setting of the former landfills, combined with the inherent variability of environmental monitoring data which can be obtained from such sites, it has been recommended that the groundwater and surface water be monitored at the site for an extended period of time.

This letter and associated attachments represents our report on the additional groundwater and surface water sampling exercises carried out to date.

Groundwater and Surface Water Sampling

Samples of groundwater and surface water samples were obtained from site during sampling exercises on the following dates:

- 2nd and 6th October 2011 - Monitoring '**Round 1'**
- 9th and 10th November 2011 - Monitoring '**Round 2'**
- 21st and 22nd February 2012 - Monitoring '**Round 3'**
- 30th and 31st May 2012 - Monitoring '**Round 4'**
- 10/11th September 2012 - Monitoring **'Round 5'** – reduced testing suite
- 11/12th December 2012 - Monitoring **'Round 6'**

The borehole and surface water sampling locations are shown on **Drawing No. 20096/9-REVA in Appendix A.**

Groundwater Samples

Groundwater samples have been obtained from the groundwater monitoring wells, where sufficient water volume has allowed.

Samples were obtained my means of dedicated water bailers following the purging of three times the well volume of water from each borehole.

Surface Water Samples

Surface water samples were obtained on each sampling occasion from the following nearby surface water features (see **Drawing No. 20096/9-REVA**):

- 'Landfill Pond' (ref: SW1) – located in the centre of Area B (North Cockley Landfill).
- 'Glebe Lake' (ref: SW2) – located off site to the east/northeast of the study site.
- 'Inn on the Pond' (Ref: SW3) – located off site immediately to the north of Area D.
- 'Mercer Lake' (Ref: SW4) – located in Mercers County Park ca 300m to the north of the study site.
- 'Angling Pond' (Ref: SW5) – disused water filled quarry workings within Area D in the north of the site which is used by a local angling club.
- 'East Angling Pond (Ref: SW6) - disused water filled quarry workings within Area D. This pond has typically been dry, but contained water in December 2012.

Chemical Testing Analysis

The collected samples were scheduled for the following suite of tests and despatched to an MCerts/UKAS accredited chemical testing laboratory (Severn Trent Analytical Services, Coventry):

- pH and metals
- Conductivity, sulphate, ammoniacal nitrogen, BOD (5 day), COD, chloride, nitrate, nitrite
- Speciated TPH and BTEX
- Speciated VOCs
- Speciated SVOCs
- Speciated PCBs
- Speciated organo-chloride and organo-phosphorus Pesticides and Herbicides

The chemical testing performed in September 2012 comprised a reduced suite of tests and samples of 'up and down gradient' boreholes and nearby surface water features were tested for the following: pH, conductivity, sulphate, ammoniacal nitrogen, BOD (5 day), COD and chloride

The results of the chemical tests are summarised in the following tables which are presented in **Appendix B**.

- Table 1 - inorganic determinands
- Table 2 - organic determinands.

Groundwater Levels and Flow Pattern

Late 2011

The previous (late 2011) ground investigation identified a relatively regular pattern of groundwater flow across the site. **Drawing No. 20096/13A in Appendix A** presents approximate groundwater contours (in mAOD) as observed in November 2011.

Groundwater levels were in the order of 120-122mAOD in the south of the site and which decreased in a northerly direction to ca. 75mAOD in the vicinity of Chlimead Lane in the north. The approximate hydraulic gradient across the site was observed to be relatively steep and was calculated to be approximately 0.053m/m.

The groundwater levels closely correlate with the level of surface water bodies located on and near to the site, which indicates that these flooded former mineral extraction features are considered to be substantially groundwater fed, although local surface water ditches, runoff from roads and agricultural land also feed into these surface water features.

The groundwater monitoring has shown that a natural water table is present within the natural Sandgate and Folkestone Bed strata but this same groundwater body would appear to intersect the waste mass within Areas A and B and partially within Area F. No 'perched' leachate within the waste mass is discernable across the site and such waters within the waste would appear to represent a continuation of the 'natural' piezometric surface, although a perched groundwater body within the wastes would appear to be present in the north of the site (in BH16 and BH17). A slight 'deflection' of the groundwater contours is, however, noted within the areas noted to possess a significant thickness of waste deposits.

Late 2012

The original groundwater monitoring performed during the main ground investigation in late 2011 was carried out towards the end of an extended period of below average rainfall in Southern England. As such, the groundwater contours shown on Drawing No. 20096/13A could be regarded as representing 'minimum' groundwater levels.

From April 2012 onwards, Southern England, as well as the UK as a whole, has seen the second wettest year on record. Groundwater level monitoring carried out over the period May

to December 2012 has seen a steady recharge in groundwater, reflected in a subtle rise in groundwater levels, particularly in the southern-most parts of the site.

Drawing No. 20096/13B in Appendix A presents the approximate groundwater contours observed in December 2012. Groundwater levels in the south of the site have been observed to be close to 125mAOD with a deflection in groundwater contours within the central southern part of the site. Groundwater levels within the waste mass (in Areas A and B) have also risen marginally, although the overall hydraulic gradient across the majority of the site has remained relatively unchanged.

The eastern fishing pond in the north of the site in Area D has been observed to be dry between October 2011 and September 2012. However, in December 2012 considerable water was observed in this pond, possibly reflecting the overall recent rise in groundwater levels. Although it should also be noted that small but steady flows of water were also observed (for the first time) in the drainage ditches which feed this pond from the south.

Groundwater and 'Leachate' Quality

Water samples obtained from the borehole monitoring installations can be classified as follows:

- *Groundwater* – where the monitoring installation response zone is located within natural strata.
- *'Leachate'* - where the monitoring installation response zone is located within waste or other made ground materials.

Tables 1 and 2 in Appendix B indicate which samples can be classified as 'groundwater' (ref. 'GW') and 'leachate' (Ref. 'L').

Inorganic Determinands

A summary of the detected concentrations of inorganic determinands within groundwater/leachate is presented in **Table 1 in Appendix B**.

The groundwater and leachate at the site has been shown to routinely possess concentrations of inorganic determinands in excess of Freshwater Environmental Quality Standards (EQS) concentrations.

The groundwater and leachate at the study site is generally characterised by elevated concentrations of arsenic, chromium, lead, selenium, copper, nickel and zinc and ammoniacal nitrogen from Areas A and B, as would be expected in landfill areas possessing putrescible wastes.

Groundwaters obtained from parts of the site underlain by 'inert' wastes (e.g. Areas C, D, E and F) are of better quality with regard to inorganic determinands, although slightly elevated metals and sulphates have also been detected. It should be noted that many boreholes located in Area F locally encountered discrete horizons of yellow clayey silt reworked Fullers Earth deposit which is characterised by high 'total' sulphate concentrations.

Elevated electrical conductivity, BOD, COD and ammoniacal nitrogen concentrations have also been detected during each sampling round, and are particularly elevated within the putrescible waste areas (Areas A and B), and have remained consistently elevated during the monitoring period. Groundwater samples obtained from natural strata underlying putrescible wastes in 'BH16 (Deep)' and 'BH17 (Deep)' located down hydraulic gradient of the landfill areas in the north of Area B have also recorded elevated concentrations of these determinands.

Concentrations of mercury, cadmium, copper, cyanide, nitrate and nitrite have generally been detected below their laboratory limits of detection and/or their respective Freshwater EQS/UK

Drinking Water Standards in groundwaters/leachates, although elevated cadmium concentrations were noted in a number of boreholes in May 2012.

It is noteworthy that elevated concentrations of inorganic determinands have also noted in the samples of groundwater obtained from boreholes located 'up hydraulic gradient' of the site (i.e. BH1, BH21).

Organic Determinands

A summary of the detected concentrations of organic determinands within groundwater/leachate is presented in **Table 2 in Appendix B**

BTEX Compounds:

These compounds have generally not been detected in excess of their respective freshwater EQS in the groundwater/leachate. However, xylenes have been detected in excess of the freshwater EQS value of 30ug/l in the leachate samples obtained from BH6 and BH15 drilled within putrescible wastes (Area B) in all monitoring rounds up to a maximum concentration of 106ug/l (BH15, Round 3 – February 2012).

Total Petroleum Hydrocarbons (TPH):

Gasoline, Diesel and Lubricating Oil Range Organic Petroleum Hydrocarbons (GRO C_6-C_{10}, DRO C_{10}-C_{20} and LRO C_{20}-C_{40}) have been detected in excess of UK Drinking Water Standards in the majority of groundwater/leachate samples from within Area B as well as locally within Areas A and F. The highest recorded concentrations of total petroleum hydrocarbons have been detected in BH31 drilled within putrescible wastes within Area B (1457ug/l TPH C_6-C_{40} in Round 2).

Concentrations of TPH have, however, seen a significant decrease in all monitoring wells over the monitoring period and, in Area F (BHs 24-30), TPH compounds have not been detected in excess of laboratory limits of detection in monitoring Rounds 3, 4 and 6 (February – December 2012).

No TPH compounds have been detected in excess of laboratory limits of detection in Areas C, D and E in all samples tested.

Polycyclic Aromatic Hydrocarbons (PAH):

PAH compounds have generally been detected at concentrations in excess of Freshwater EQS from boreholes located across Area B and locally within Area F and have not been detected in excess of laboratory limits of detection in other parts of the site.

Naphthalene has been detected in excess of the Freshwater EQS value of 10ug/l within the centre of Area B (i.e. BH6, BH7, BH15, BH31), although the concentrations of naphthalene have been observed to decrease in the down gradient boreholes BH16 and BH17. Other PAH compounds have also been detected in boreholes located across Area A but at generally lower concentrations than naphthalene.

Significantly elevated naphthalene concentrations (max. 621ug/l) have also been observed in BH26 in Area F during monitoring Rounds 1 and 2 (Oct-Nov 2011), but have not been detected in this borehole, or any other boreholes located in Area F in the more recent monitoring. The source for this contamination initially noted in BH26 is considered to be the deposits of ash and clinker materials that are locally present within the fill materials in this part of the site.

Benzo(a)pyrene has not been detected in excess of the laboratory limit of detection in any samples tested to date.

Volatile Organic Compounds (VOCs):

VOCs have been detected in groundwater/leachate substantially across Area A and Area B at relatively low/trace concentrations (typically <10ug/l for each compound, were detected).

1,2,4-Trimethylbenzene was the most common contaminant and made up most of the VOC concentrations detected in the October 2011 (Round 1) samples. The November 2011 (Round 2) samples possessed more elevated concentrations of VOCs, particularly in BH6, BH15 and BH31 in Area A, and these contaminants predominantly comprised 1,2,4-trimethylbenzene as well as chloroethane, vinyl chloride, chlorobenzene and iso-propylbenzene.

The samples obtained in Round 3 (February 2012) recorded the presence of the following VOCs at trace concentrations, particularly within leachate from BH15 and within groundwater from BH17 (Deep).

- Chlorobenzene
- Chloroethane
- 1,4-Dichlorobenzene
- 1,2,4-trimethylbenzene
- 1,1-dichloroethane

The samples obtained during Round 4 (May 2012) again recorded VOCs in boreholes located in Area B, in particular BH6, BH15 and BH17. Chlorobenzene and 1,2,4-trimethylbenzene were the most commonly detected VOCs making up most of the 'total' VOC concentrations detected, although 1,3,5-trimeththylbenzene, p-isopropyltoluene, 1,4-dichlorobenzene and iso-propylbenzene were detected in BH15 at individual concentrations of <5ug/l.

The most recent monitoring results (Round 6 – December 2012) shows a similar pattern of VOC contamination, with these compounds being detected at in Areas A and B and mainly in BH6 and BH15. Chlorobenzene and 1,2,4-trimethylbenzene were again the most commonly detected VOCs making up most of the 'total' VOC concentrations detected, although p- and iso-propylbenzene, 1,2- and 1,4-dichlorobenzene were also locally detected at trace concentrations.

VOCs have not been detected at significant concentrations or in excess of limits of laboratory detection within boreholes located within Area A, C, E and F during any of the monitoring rounds.

Semi-Volatile Organic Compounds (SVOCs):

With regard to SVOCs, 3,4-Methylphenol and Dibenzofuran were the most commonly detected contaminants and were detected at trace concentrations in boreholes located across Areas A and B during monitoring Round 1 and 2.

The SVOCs dibenzofuran and 2-methylnaphthalene were detected at lower concentrations in a fewer number of boreholes in Area A and B during monitoring Round 3.

No SVOC compounds were detected in any borehole during the monitoring Round 4 carried out in late May 2012.

The only SVOC compound detected during the most recent monitoring Round 6 (December 2012 was diethylphthalate in upgradient BH1 (5.3ug/l)

Pesticides and Herbicides:

Organo-chlorine and organo-phosphorus pesticides/herbicides have been detected at trace concentrations (generally <0.05ug/l) from those boreholes drilled through putrescible waste materials within the centre of Area A (BH14) and across Area B (BH6, BH7, BH15, BH16, BH17

and BH31). The pesticides/herbicides detected have been 'dichlobenil' and 1,2,4 trichlorobenzene but these have not generally detected in excess of UK drinking water quality standard concentrations.

Polychlorinated biphenyls (PCBs):

PCBs have only been detected in excess of laboratory detection limits in the samples of leachate obtained from BH4 and BH14 (Area A) in the earliest 2 monitoring rounds (max. concentration 0.02ug/l – BH4, Round 1). No PCBs have been detected in any other borehole during any other monitoring round.

Surface Water Quality

Inorganic Determinands

A summary of the detected concentrations of inorganic determinands within surface waters is presented in **Table 1 in Appendix B**.

For the most part, the concentrations of metals have not been detected in excess of limits of laboratory detection or in excess of Freshwater Environmental Quality Standards (EQS). The exceptions to this were as follows:

- Zinc – detected marginally in excess of the most stringent EQS value of 8ug/l in the following samples:
  - SW1 and SW3 in Round 1
  - SW1-SW4 in Round 2,
  - SW5 in Round 3
  - SW2 and SW3 in Round 4.
- Lead - detected in excess of the most stringent EQS value of 4ug/l the following samples:
  - SW1 in Round 1
  - SW2 and SW3 in Round 4.
  - SW3 in Round 6

Ammoniacal nitrogen, BOD, COD and nitrite have been detected during different monitoring rounds in SW1 and SW3. The samples SW1 have been obtained from a surface water feature existing as a shallow pond on the surface of the former landfill area that is frequented by numerous seagulls and other birds and the presence of such contaminants would be expected. Samples SW3 are obtained from the pond near to the 'Inn on the Pond' public house and can only be obtained from the densely vegetated pond margins where significant organic detritus frequently enters the samples.

Organic Determinands

A summary of the detected concentrations of organic determinands within surface waters is presented in **Table 2 in Appendix B**.

No significant concentrations of inorganic determinands have been detected in the surface water samples obtained to date.

Trace concentrations of pesticides were noted in the Mercer's Lake (SW4) to the north of the site in monitoring Round 1 (0.01ug/l). The presence of trace concentrations of pesticides in this water body could be derived from adjacent agricultural land and was not detected in the subsequent (Round 2-6) samples.

A trace concentration of an SVOC compound (3,4-methylphenol) was detected in the 'Inn on

the Pond' surface water feature (SW3) in Round 2 (3.2ug/l). The compound is widely used as a disinfectant and insecticide but can also be naturally produced by bacteria and other small organisms in the breakdown of organic matter.

Petroleum hydrocarbons C_{20}-C_{40} have periodically been detected in SW1 (40ug/l - Round 2) and SW2 (80ug/l - Round 3). These detected concentrations are considered to be due to the presence of organic sediments which inadvertently entered the samples during sampling.

Summary and Conclusions

The study site comprises a series of contiguous former mineral extraction quarries which have subsequently been landfilled with controlled wastes. The waste materials possess no basal liner containment system or leachate collection systems and directly overlie permeable sand and sandstone strata. The landfills have therefore been designed on the 'dilute and disperse' principle.

The wastes within Area A and B have been observed to be putrescible in nature, whereas across the remainder of the site the wastes are more typically 'inert' in nature and visually possess less 'contamination potential' and are generally shallower in nature, although in Area F the inert wastes have been placed to ca 10-15m thickness.

The wastes across the whole site possess a good covering (ca 1.5-2.0m thick) of clayey restoration soil cover and in Area B, a geomembrane has been observed across parts of this part of the site. The presence of these restoration soils and cap, combined with the northerly sloping topography would ultimately be seek to reduce the amount of infiltration into the waste mass and thereby reduce leachate generation, and the site possesses a series of surface water collection ditches and drains.

However, groundwater level monitoring has shown that the natural groundwater table is within in situ natural strata at relatively shallow depth in the south of the site and the groundwater table would appear to intersect the lower waste deposits across Areas A and B, and also Area F. The shallower waste materials within Area C, D and E would appear to largely be present above the water table and are unsaturated.

The steep hydraulic gradient observed across the site, combined by the relatively high permeability of both the waste and underlying natural sand/sandstone strata would suggest that groundwater movement beneath the site and through the saturated waste mass would be relatively rapid. Given the age of most of the wastes (deposited in the 1960s-1980s), 'flushing' of contaminants from the wastes by a high groundwater flux over 50-25 years is likely to have taken place.

The quality of the leachate within Areas A and B and, to a lesser extent Area F, possesses contamination by some metals and is also characterised by elevated ammoniacal nitrogen, electrical conductivity, BOD and COD concentrations. However, the leachate is considered to be relatively 'dilute' when compared to leachates from modern contained landfill sites and this is considered to reflect the diluting and 'flushing' potential of the groundwater which flows through the waste mass. Furthermore, although the leachate possesses concentrations of VOC and TPH components, these are also at relatively low concentrations and the more volatile and soluble TPH and VOC fractions (e.g. BTEX compounds) are generally absent from the test data.

Groundwater beneath the landfilled areas is also locally characterised by elevated inorganic and organic contamination, although organic contaminants were generally absent from areas of inert wastes (e.g. Area C, D, E and F) in the later monitoring rounds.

The quality of the surface waters has been determined to be below freshwater Environmental Quality Standards with no evidence for landfill leachate being detected within them. Slightly elevated concentrations of zinc and lead has been detected in some surface water features but this has been detected in ponds located to the east and some distance to the north of the site

as well as in the nearby Angling Pond, and this could be a reflection of the natural local groundwater geochemistry or derived from other non-landfill sources. Similarly, trace concentrations of SVOC, pesticide and TPH compounds have periodically been detected in some surface water bodies, but this has been interpreted as being as a result of non-landfill sources or of natural origin.

The next scheduled groundwater monitoring exercise is proposed to be carried out in March 2013 for the reduced suite of inorganic determinands

We trust that you find the above and enclosed information to be of interest.

Yours sincerely

[redacted]

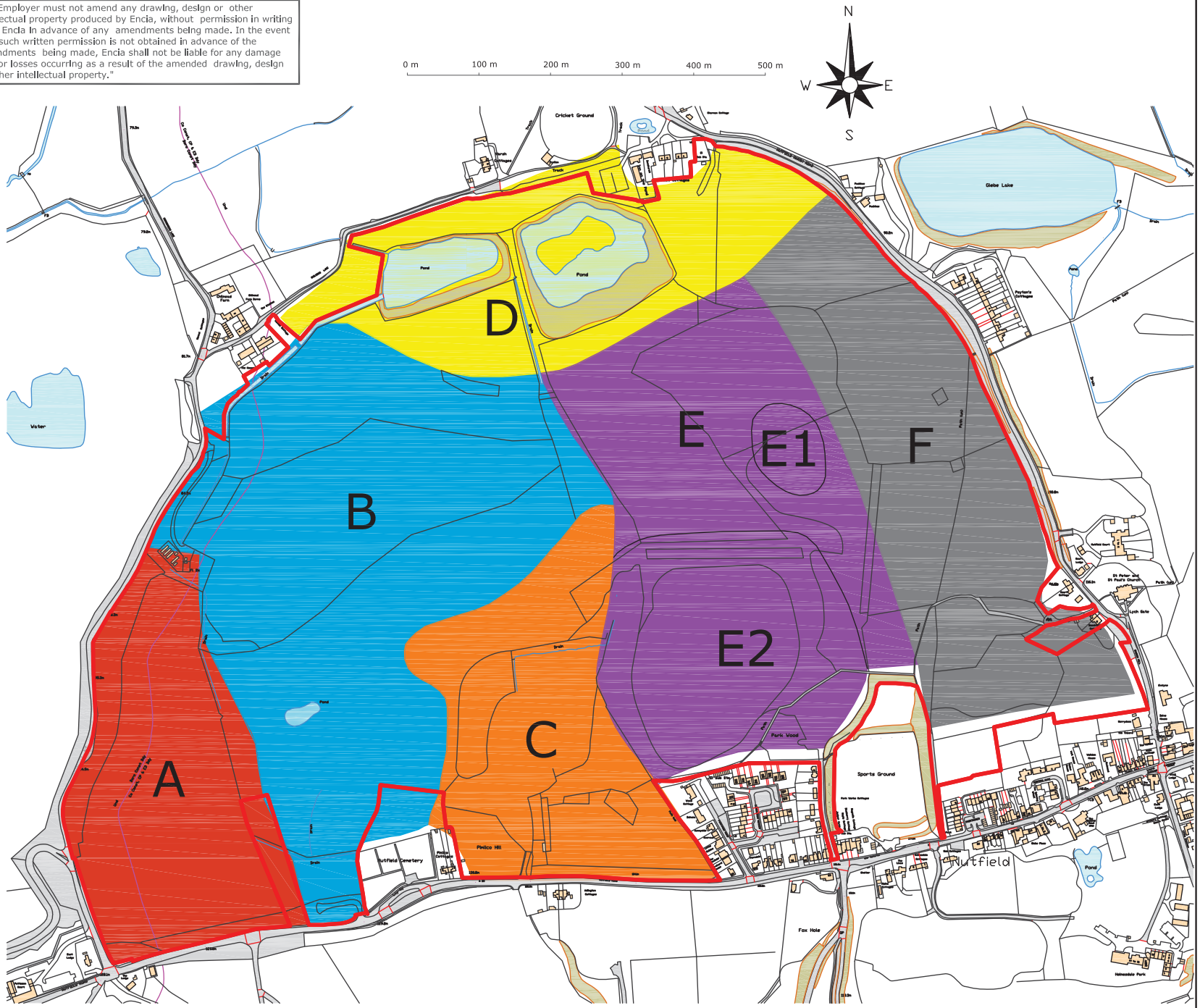
[redacted] BSc, MSc, FRGS, MCIWEM, C.WEM
for and on behalf of
ENCIA REGENERATION LIMITED

Encs – Appendix A - Drawings:
20096/2 – Site Areas Plan
20096/9-REVA – Exploratory Hole Location Plan
20096/13A – Approximate Groundwater Contours November 2011
20096/13B – Approximate Groundwater Contours December 2012

Appendix B – Groundwater/Surface Water Summary Tables
Table 1 – Inorganic Determinands
Table 2 – Organic Determinands

APPENDIX A

Drawings



KEY

A	PARK QUARRY
B	NORTH COCKLEY
C	GORE MEADOW
D	SAND PIT
E	BEECHFIELD QUARRY
F	CHURCH HILL

ENCIA
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Company No 6721047

CLIENT

EVONIK DEGUSSA UK HOLDINGS LTD

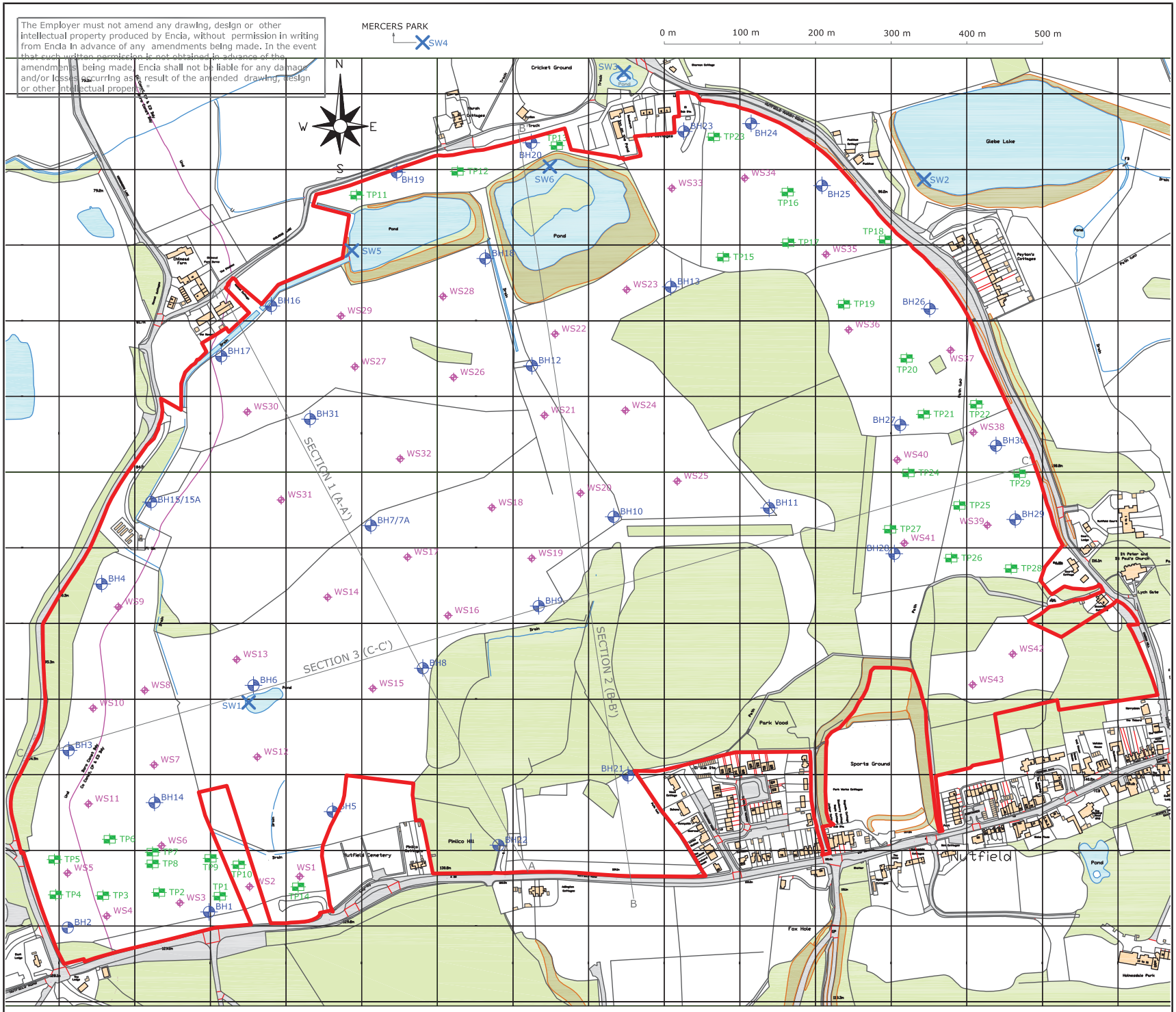
JOB TITLE

FORMER LANDFILL & QUARRIES REDHILL, SURREY

DRAWING TITLE

SITE AREAS PLAN

STATUS	FINAL	
DRAWN BY: KL	SIGNATURE	DATE: 04/11/2011
APPROVED: AJA	SIGNATURE	DATE: 04/11/2011
SCALE: 1:5000@A3	DRG No.: 20096-2	



KEY

- SITE BOUNDARY
- TP1 — ENCIA TRIAL PIT (2011)
- BH1 — ENCIA BOREHOLE (2011)
- WS1 — ENCIA WINDOW SAMPLE (2011)
- SW1 — SURFACE WATER SAMPLE POINT

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CLIENT

EVONIK DEGUSSA UK HOLDINGS LTD

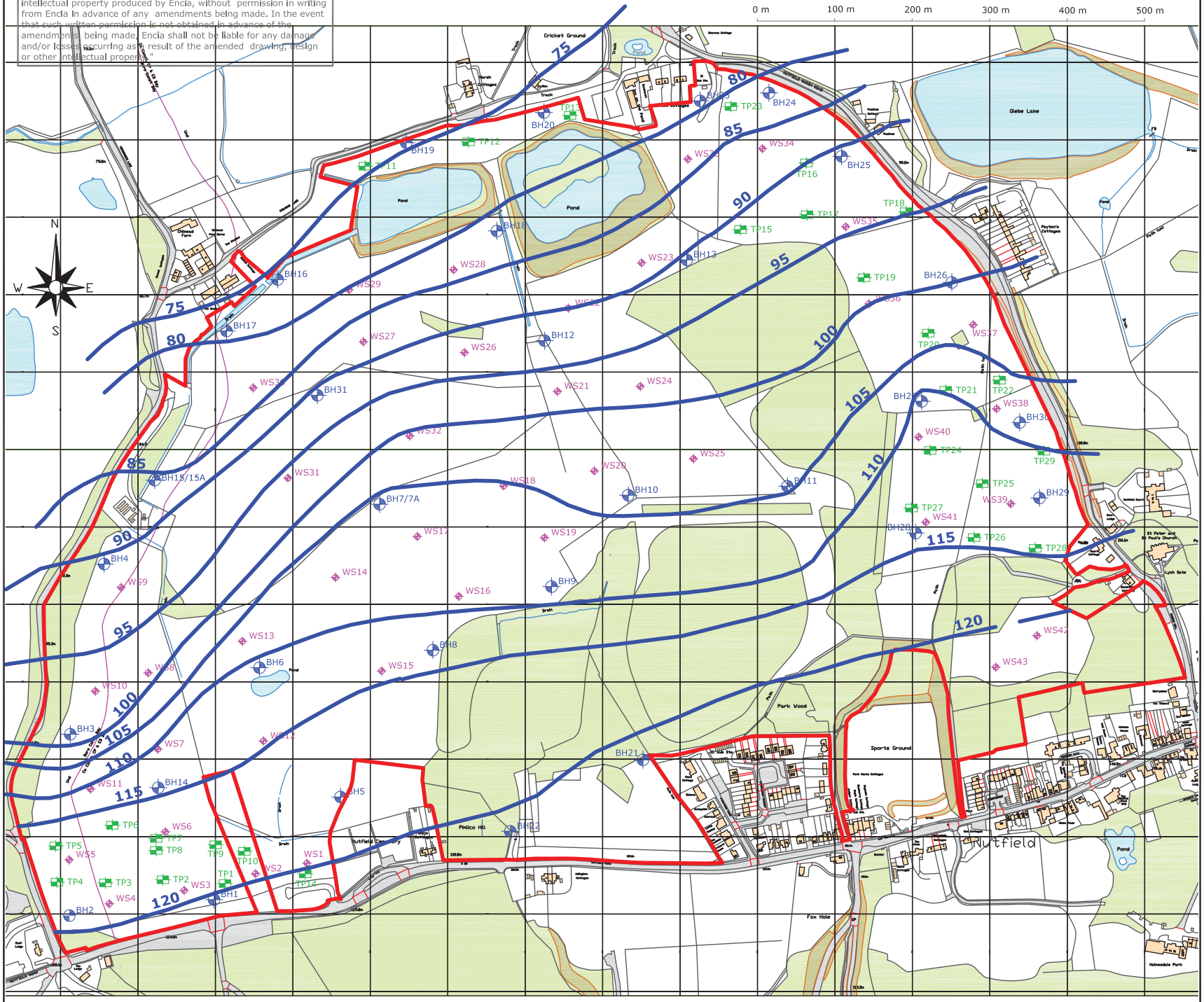
JOB TITLE

FORMER LANDFILLS/QUARRIES REDHILL, SURREY

DRAWING TITLE

EXPLORATORY HOLE LOCATION PLAN

STATUS	FINAL	
DRAWN BY: KL	SIGNATURE:	DATE: 13/12/2012
APPROVED: AJA	SIGNATURE:	DATE: 13/12/2012
SCALE: 1:2500@A1	DRG No.: 20096-9-REVA	



KEY

SITE BOUNDARY

85 APPROXIMATE GROUNDWATER CONTOUR (mAOD) (9-10 November 2011)

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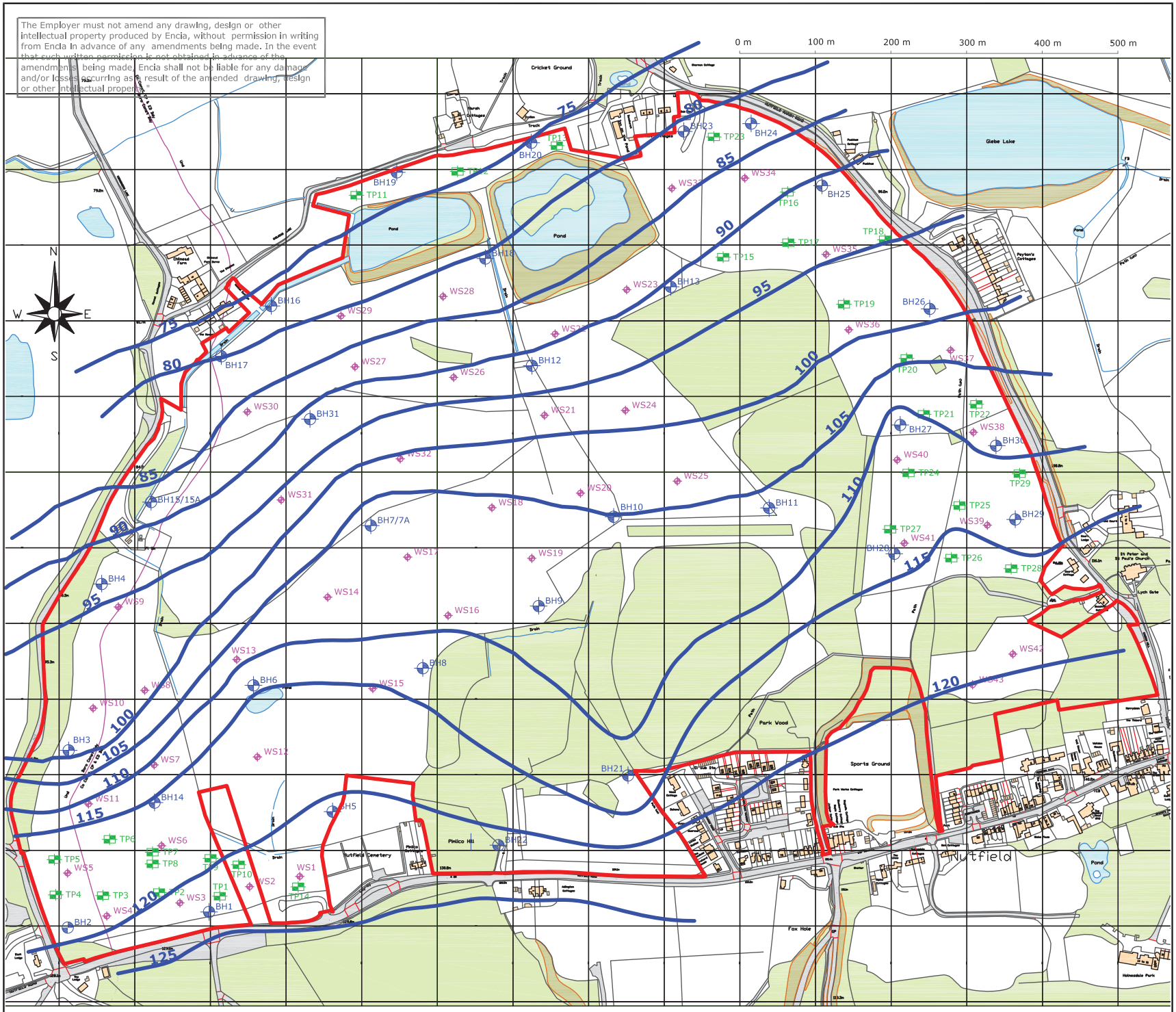
JOB TITLE

FORMER LANDFILLS/QUARRIES REDHILL, SURREY

DRAWING TITLE

APPROXIMATE GROUNDWATER CONTOURS (NOVEMBER 2011)

STATUS	FINAL	
DRAWN BY: KL	SIGNATURE:	DATE: 15/11/2011
APPROVED: AJA	SIGNATURE:	DATE: 15/11/2011
SCALE: 1:5000@A3	DRG No.: 20096-13A	



KEY

SITE BOUNDARY

85 APPROXIMATE GROUNDWATER CONTOUR (mAOD) (11-12 December 2012)

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EVONIK DEGUSSA UK HOLDINGS LTD

JOB TITLE

FORMER LANDFILLS/QUARRIES REDHILL, SURREY

DRAWING TITLE

APPROXIMATE GROUNDWATER CONTOURS (DECEMBER 2012)

STATUS	FINAL	
DRAWN BY: KL	SIGNATURE:	DATE: 13/12/2012
APPROVED: AJA	SIGNATURE:	DATE: 13/12/2012
SCALE: 1:5000@A3	DRG No.: 20096-13B	

APPENDIX B

Summary Tables

Former Landfills, Nutfield Road, Redhill Surrey

Table 1 Summary of Inorganic Contamination in Groundwater and Surface Water (October 2011- December 2012)

All results e pressed as mg/l unless otherwise stated

ROUND 1 OCTOBER 2011

Determinand	Trigger Level	SITE AREA A				B							E	F	
		BH1	BH3	BH4	BH14	BH6	BH7	BH15	BH16 (D)	BH16 (S)	BH17(D)	BH31	BH11	BH24	BH26
		GW	L	GW	L	L	L	L	GW	L	GW	L	GW	GW	GW
pH		6.9	6.9	7	7	7.1	7.3	7	6.9	6.9	7.1	7.2	6.8	7.1	6.7
As	(0.05)*	0.0631	0.0651	0.0217	0.0574	0.0426	0.0495	0.0294	0.1096	0.0164	0.0776	0.0485	0.0553	0.0442	0.0434
Cd	(0.005)*	0.0138	0.0534	0.0052	0.0355	0.0134	0.0156	0.0221	0.0178	0.003	0.0194	0.0045	0.0029	0.0034	0.0089
Cr	(0.005)*	0.1656	0.2524	0.0587	0.1797	0.2012	0.5223	0.1613	0.5428	0.027	0.2991	0.1129	0.0357	0.2673	0.1571
Pb	(0.004)*	0.499	1.46	0.269	2.15	1.13	2.47	1.06	1.6	0.206	1.63	0.599	0.097	0.47	3.38
Hg	(0.001)*	0.0001	0.0004	0.0004	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001	0.0001	0.0002	0.0001
Se	(0.01)$	0.0914	0.0698	0.0381	0.0104	0.0469	0.0204	0.0129	0.059	0.0053	0.0194	0.0114	0.0115	0.0809	0.0105
B	(2)*	0.2	0.64	0.26	0.23	2.57	4	2.01	1.22	0.68	1.62	3.09	0.2	0.36	0.42
Cu	(0.028)*	0.572	1.29	0.082	0.43	0.364	0.716	0.424	0.987	0.113	0.47	0.022	0.033	0.348	0.412
Ni	(0.05)*	0.523	0.542	0.13	0.233	0.188	0.276	0.242	0.47	0.025	0.135	0.082	0.074	0.319	0.235
Zn	(0.008)*	1.16	2.86	0.468	4.15	3.56	3.69	1.78	3.95	0.266	2.31	0.909	0.214	0.915	6.46
CN	(0.05)$	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.011	0.066
SO_4	(400)*	64.8	79.4	47.9	14.2	17.9	5.00	5.00	20	15.1	52.9	8.82	327	99.7	349
Conductivity	(1500)$ uS/cm	1430	2620	625	1760	6200	8540	5740	3090	3000	4010	7670	1830	1250	1470
NH_3-N	(0.015)*	0.61	6.95	0.87	29.9	388	590	347	143	123	230	558	10.5	0.19	2.59
BOD 5day	4	19	27	8	49	153	87	48	76	21	34	78	8	24	30
COD	250	1430	1900	161	981	1660	3050	1370	1500	554	1820	1870	244	525	770
Nitrate	(50)$	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29
Nitrite	0.1($)	0.045	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.03	0.006	0.006

Determinand	Surface Water SW1	SW2	SW3	SW4	SW5
	Landfill pond	Glebe Lake	Inn on the Pond	Mercer Lake	Angling Pond
pH	7.7	8.1	7.5	8	8.1
As	0.0037	0.0014	0.0014	0.0053	0.0019
Cd	0.0006	0.0006	0.0006	0.0006	0.0006
Cr	0.0007	0.0007	0.0007	0.0007	0.0007
Pb	0.005	0.005	0.005	0.005	0.005
Hg	0.0001	0.0001	0.0001	0.0001	0.0001
Se	0.0016	0.0016	0.0016	0.0016	0.0016
B	0.12	0.12	0.12	0.14	0.12
Cu	0.001	0.005	0.003	0.003	0.003
Ni	0.002	0.004	0.003	0.007	0.003
Zn	0.003	0.021	0.007	0.033	0.006
CN	0.009	0.02	0.021	0.015	0.015
SO_4	1.2	47.9	1.3	128	28.4
Conductivity	309	259	454	585	315
NH_3-N	0.64	0.19	0.19	0.19	0.19
BOD 5day	2	1	3	1	1
COD	72	11	37	14	20
Nitrate	0.29	0.29	0.29	0.29	0.29
Nitrite	0.006	0.006	0.029	0.006	0.006

ROUND 2 NOVEMBER 2011

Determinand	Trigger Level	SITE AREA A				B							E	F	
		BH1	BH3	BH4	BH14	BH6	BH7	BH15	BH16 (D)	BH16 (S)	BH17(D)	BH31	BH11	BH26	BH27
		GW	L	L	L	L	L	L	GW	L	GW	L	GW	GW	GW
pH		6.9	6.8	7.2	7.1	7.1	7.4	7	7.1	6.9	7.2	7.5	6.8	6.7	8.1
As	(0.05)*	0.1329	0.04	0.007	0.0414	0.017	0.0421	0.0205	0.0344	0.0217	0.1885	0.0501	0.0392	0.0196	0.0352
Cd	(0.005)*	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006
Cr	(0.005)*	0.0009	0.002	0.0007	0.0009	0.0051	0.0393	0.0066	0.0031	0.0035	0.0036	0.0231	0.0008	0.0007	0.0007
Pb	(0.004)*	0.005	0.005	0.005	0.007	0.005	0.017	0.006	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Hg	(0.001)*	0.0002	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0016
Se	(0.01)$	0.0029	0.0068	0.0031	0.0048	0.0047	0.0061	0.0035	0.0062	0.0036	0.0025	0.0045	0.0016	0.0078	0.003
B	(2)*	0.32	0.39	0.23	0.46	2.11	3.69	1.79	1.29	1.23	1.62	2.99	0.26	0.34	0.31
Cu	(0.028)*	0.003	0.004	0.003	0.003	0.003	0.011	0.003	0.003	0.003	0.005	0.001	0.003	0.003	0.003
Ni	(0.05)*	0.017	0.084	0.004	0.007	0.021	0.056	0.046	0.028	0.012	0.021	0.073	0.014	0.012	0.004
Zn	(0.008)*	0.082	0.055	0.008	1.08	0.015	0.028	0.581	0.009	0.196	0.244	0.381	0.05	0.047	0.018
CN	(0.05)$	0.009	0.036	0.009	0.145	0.011	0.019	0.011	0.009	0.012	0.009	0.028	0.009	0.289	0.009
SO_4	(400)*	107	10	29.5	8.2	55.1	2.7	1.0	72.1	270	14.6	2.8	291	305	2740
Conductivity	(1500)$ uS/cm	1580	2850	600	1770	4240	8740	5970	3450	3320	4500	8740	1220	1330	3310
NH_3-N	(0.015)*	0.19	9.93	0.55	25.8	241	589	363	174	143	49	642	8.18	0.91	0.48
BOD 5day	4	1	11	4	23	28	58	38	17	17	90	102	2	16	3
COD	250	167	646	80	612	577	1990	243	890	528	2290	1740	88	550	280
Nitrate	(50)$	1.4	0.29	0.47	0.29	0.29	0.31	0.34	0.35	0.35	0.3	0.34	0.29	0.29	0.29
Nitrite	0.1($)	0.006	0.006	0.072	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.044	0.006	0.02

Determinand	Surface Water SW1	SW2	SW3	SW4	SW5
	Landfill pond	Glebe Lake	Inn on the Pond	Mercer Lake	Angling Pond
pH	7.9	8.5	7.3	8	7.8
As	0.0034	0.0014	0.0014	0.0081	0.0015
Cd	0.0006	0.0006	0.0006	0.0006	0.0006
Cr	0.0008	0.0007	0.0007	0.0007	0.0007
Pb	0.006	0.005	0.005	0.005	0.005
Hg	0.0001	0.0001	0.0001	0.0001	0.0001
Se	0.0016	0.0016	0.0016	0.0016	0.0016
B	0.23	0.21	0.35	0.28	0.24
Cu	0.002	0.002	0.002	0.003	0.003
Ni	0.002	0.002	0.002	0.002	0.002
Zn	0.017	0.016	0.019	0.017	0.006
CN	0.009	0.009	0.009	0.009	0.009
SO_4	3.1	49.6	1.0	130	71.2
Conductivity	359	257	403	583	359
NH_3-N	0.19	0.19	0.19	0.19	0.19
BOD 5day	3	15	17	1	1
COD	73	157	44	21	111
Nitrate	1.3	0.36	0.39	0.52	0.49
Nitrite	0.031	0.006	0.007	0.034	0.006

ROUND 3 FEBRUARY 2012

Determinand	Trigger Level	SITE AREA A			B						C	E	F			
		BH1	BH4	BH14	BH6	BH7	BH15	BH16 (S)	BH17(D)	BH31	BH21	BH11	BH24	BH26	BH27	BH30
		GW	L	L	L	L	L	L	GW	L	GW	GW	GW	GW	GW	GW
pH		6.7	7	7	7	7.3	6.7	7	7.1	7.1	6.8	6.8	7.1	6.5	7.1	7.1
As	(0.05)*	0.1451	0.0103	0.0729	0.0536	0.0377	0.0245	0.0211	0.3255	0.0338	0.0336	0.1356	0.0659	0.047	0.073	0.0753
Cd	(0.005)*	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006	0.0012	0.0013	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006
Cr	(0.005)*	0.0020	0.002	0.0020	0.009	0.0392	0.003	0.003	0.006	0.0125	0.002	0.0020	0.0020	0.0020	0.0020	0.0020
Pb	(0.004)*	0.006	0.006	0.016	0.019	0.133	0.009	0.006	0.037	0.043	0.006	0.006	0.006	0.006	0.006	0.006
Hg	(0.001)*	0.0002	0.0001	0.0001	0.0001	0.0001	0.0003	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0001	0.0001
Se	(0.01)$	0.0082	0.0136	0.0116	0.015	0.0073	0.0054	0.0029	0.0048	0.0026	0.011	0.0126	0.0699	0.0124	0.0173	0.0199
B	(2)*	0.38	0.4	0.63	2.08	3.01	0.58	1.14	1.32	2.76	0.29	0.33	0.25	0.27	0.23	0.23
Cu	(0.028)*	0.009	0.009	0.009	0.009	0.035	0.009	0.009	0.043	0.227	0.009	0.009	0.009	0.009	0.009	0.009
Ni	(0.05)*	0.014	0.005	0.007	0.031	0.051	0.009	0.006	0.025	0.175	0.005	0.035	0.005	0.013	0.006	0.004
Zn	(0.008)*	0.02	0.018	0.04	0.09	0.174	0.04	0.04	0.131	0.359	0.018	0.018	0.018	0.02	0.018	0.018
CN	(0.05)$	0.009	0.009	0.009	0.029	0.01	0.009	0.01	0.009	0.015	0.009	0.009	0.009	0.065	0.009	0.009
SO_4	(400)*	96.8	24.5	35	48	220	280	101	344	1730	25.3	395	17.3	227	1390	1420
Conductivity	(1500)$ uS/cm	1940	556	2000	4330	7240	2160	3030	3740	8130	339	1450	410	1230	2040	2080
NH_3-N	(0.015)*	0.27	0.27	17.3	245	438	72	132	196	439	0.27	0.27	0.27	0.58	0.27	0.27
BOD 5day	4	2	1	40	51	71	16	14	122	72	1	9	7	4	1	3
COD	250	328	82	844	778	1820	371	288	2700	1080	275	413	-	177	135	139
Nitrate	(50)$	1	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.8	0.4	0.7	0.7
Nitrite	0.1($)	0.046	0.058	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.213	0.025	0.059	0.025	0.025

Determinand	Surface Water SW1	SW2	SW3	SW4	SW5
	Landfill pond	Glebe Lake	Inn on the Pond	Mercer Lake	Angling Pond
pH	7.6	8.7	7.4	8.2	7.9
As	0.0028	0.0014	0.0014	0.0059	0.0014
Cd	0.0006	0.0006	0.0006	0.0006	0.0006
Cr	0.0020	0.0020	0.0020	0.0020	0.0020
Pb	0.006	0.006	0.006	0.006	0.006
Hg	0.0001	0.0001	0.0001	0.0001	0.0001
Se	0.0016	0.0016	0.0016	0.0016	0.0016
B	0.23	0.23	0.23	0.26	0.23
Cu	0.009	0.009	0.009	0.009	0.009
Ni	0.003	0.003	0.003	0.003	0.003
Zn	0.018	0.018	0.018	0.018	0.02
CN	0.009	0.009	0.009	0.009	0.009
SO_4	44.7	51.4	22.4	126	56
Conductivity	499	288	499	601	463
NH_3-N	1.28	0.27	0.27	0.27	0.27
BOD 5day	8	1	2	1	1
COD	55	12	45	21	29
Nitrate	0.4	0.4	0.4	0.4	0.4
Nitrite	0.025	0.025	0.025	0.025	0.025

ROUND 4 MAY 2012

Determinand	Trigger Level	SITE AREA A			B						C	E	F			
		BH1	BH4	BH14	BH6	BH7	BH15	BH16 (S)	BH17 (S)	BH31	BH21	BH11	BH24	BH26	BH27	BH30
		GW	L	L	L	L	L	L	L	L	GW	GW	GW	GW	GW	GW
pH		7	7.1	7.1	7	7.4	7	7	7.1	7.4	DR	6.8	DR	7.1	7.6	7.1
As	(0.05)*	0.1082	0.0138	0.0659	0.0354	0.0253	0.0478	0.2766	0.192	0.1187		0.0404		0.142	0.227	0.0874
Cd	(0.005)*	0.0011	0.0006	0.0393	0.0032	0.0039	0.0033	0.0067	0.0082	0.0042		0.0006		0.0111	0.0198	0.0099
Cr	(0.005)*	0.0141	0.008	0.257	0.0267	0.0615	0.0449	0.0412	0.0739	0.0436		0.0111		0.1342	0.1428	0.1085
Pb	(0.004)*	0.056	0.021	3.33	0.095	0.309	0.318	0.125	0.245	0.442		0.028		0.509	4.18	0.422
Hg	(0.001)*	0.0003	0.0001	0.0001	0.0001	0.0003	0.0004	0.0001	0.0001	0.0001		0.0001		0.0002	0.0015	0.0001
Se	(0.01)$	0.0064	0.0212	0.0144	0.0071	0.0037	0.0077	0.0052	0.0035	0.0047		0.0026		0.0328	0.0495	0.0245
B	(2)*	0.23	0.23	0.65	0.55	3.25	0.74	0.74	0.95	2.13		0.23		0.37	0.63	0.39
Cu	(0.028)*	0.059	0.02	0.621	0.044	0.078	0.121	0.089	0.101	0.66		0.012		0.145	0.387	0.119
Ni	(0.05)*	0.036	0.023	0.393	0.024	0.055	0.054	0.018	0.045	0.088		0.065		0.542	0.567	0.449
Zn	(0.008)*	0.273	0.164	5.32	0.567	0.28	0.537	0.194	0.351	1.64		0.08		2.27	3.93	1.85
CN	(0.05)$	0.01	0.01	0.01	0.01	0.01	0.01	-	0.01	0.011		0.01		0.01	0.01	0.01
SO_4	(400)*	-	-	-	-	-	-	-	-	-		-		-	-	-
Conductivity	(1500)$ uS/cm	1970	559	1660	3360	6340	4020	3200	3940	7030		1490		2090	2420	2090
NH_3-N	(0.015)*	0.27	0.27	16	178	375	224	130	220	480		0.44		0.27	0.27	0.27
BOD 5day	4	2	1	42	38	59	42	33	69	88		9		3	5	3
COD	250	444	99	1600	779	1260	1240	655	1840	1420		134		435	306	248
Nitrate	(50)$	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4		1.3		0.4	0.4	0.4
Nitrite	0.1($)	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025		0.025		0.025	0.025	0.025

Determinand	Surface Water SW1	SW2	SW3	SW4	SW5
	Landfill pond	Glebe Lake	Inn on the Pond	Mercer Lake	Angling Pond
pH	7.9	7.1	7.4	8.2	8.4
As	0.0067	0.0116	0.003	0.0054	0.0016
Cd	0.0006	0.0006	0.0006	0.0006	0.0006
Cr	0.002	0.004	0.002	0.002	0.002
Pb	0.006	0.015	0.008	0.006	0.006
Hg	0.0001	0.0001	0.0001	0.0001	0.0001
Se	0.0016	0.0016	0.0016	0.0016	0.0016
B	0.23	0.23	0.23	0.23	0.23
Cu	0.009	0.009	0.009	0.009	0.009
Ni	0.006	0.013	0.005	0.005	0.003
Zn	0.018	0.07	0.05	0.018	0.018
CN	0.01	0.01	0.01	0.01	0.01
SO_4	-	-	-	-	-
Conductivity	435	265	376	581	472
NH_3-N	0.27	0.27	0.27	0.27	0.27
BOD 5day	3	9	7	1	1
COD	47	609	159	18	44
Nitrate	0.4	0.4	0.4	0.4	0.4
Nitrite	0.291	0.026	0.226	0.025	0.025

ROUND 5 SEPTEMBER 2012 (Reduced 'Quarterly' Suite)

Determinand	Trigger Level	SITE AREA A			B						C	E	F			
		BH1	BH4	BH14	BH6	BH7	BH15	BH16 (S)	BH17 (S)	BH31	BH21	BH11	BH24	BH26	BH27	BH30
		GW	L	L	L	L	L	L	L	L	GW	GW	GW	GW	GW	GW
pH		7.3	7.6	-	-	-	7.0	7.3	7.4	-	-	-	8.1	-	-	7.5
As	(0.05)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cd	(0.005)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cr	(0.005)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pb	(0.004)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hg	(0.001)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Se	(0.01)$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B	(2)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cu	(0.028)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ni	(0.05)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zn	(0.008)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CN	(0.05)$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SO_4	(400)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity	(1500)$ uS/cm	1760	555	-	-	-	3990	7100	6730	-	-	-	575	-	-	2090
NH_3-N	(0.015)*	0.27	0.27	-	-	-	221	474	435	-	-	-	0.28	-	-	0.27
BOD 5day	4	2	1	-	-	-	13	106	24	-	-	-	2	-	-	4
COD	250	39	19	-	-	-	392	1080	873	-	-	-	33	-	-	71
Chloride	250 *	317	7.33	-	-	-	463	1000	937	-	-	-	63.4	-	-	8.72
Nitrate	(50)$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrite	0.1($)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Determinand	Surface Water SW1	SW2	SW3 ■	SW4	SW5
	Landfill pond	Glebe Lake	Inn on the Pond	Mercer Lake	Angling Pond
pH	8.3	8.1	7.1	8.1	8.3
As	-	-	-	-	-
Cd	-	-	-	-	-
Cr	-	-	-	-	-
Pb	-	-	-	-	-
Hg	-	-	-	-	-
Se	-	-	-	-	-
B	-	-	-	-	-
Cu	-	-	-	-	-
Ni	-	-	-	-	-
Zn	-	-	-	-	-
CN	-	-	-	-	-
SO_4	-	-	-	-	-
Conductivity	265	242	381	567	309
NH_3-N	0.27	0.27	0.83	0.27	0.27
BOD 5day	2	1	100	1	2
COD	52	23	3020	49	35
Chloride	16.8	10.3	49.1	61.7	10.8
Nitrate	-	-	-	-	-
Nitrite	-	-	-	-	-

ROUND 6 DECEMBER 2012

Determinand	Trigger Level	SITE AREA A				B							C	D	E		F				
		BH1	BH3	BH4	BH14	BH6	BH7	BH15	BH16 (S)	BH16 (D)	BH17 (D)	BH31	BH21	BH18	BH11	BH12	BH24	BH26	BH27	BH29	BH30
		GW	L	L	L	L	L	L	L	GW	GW	L	GW	L	GW	GW	GW	GW	GW	GW	GW
pH		7.10	6.70	7.10	7.10	7.10	7.40	7.00	7.10	6.90	7.00	7.10	6.80	7.00	7.00	7.40	6.80	6.90	7.50	7.60	7.00
As	(0.05)*	0.0077	0.0685	0.0046	0.0092	0.0048	0.0253	0.0106	0.0082	0.0151	0.0132	0.0174	0.0055	0.0451	0.0137	0.0238	0.0212	0.0350	0.0273	0.0128	0.0032
Cd	(0.005)*	0.0006	0.003	0.0006	0.001	0.0006	0.0007	0.0006	0.0006	0.0006	0.0009	0.0006	0.0006	0.0012	0.0006	0.0006	0.0012	0.0006	0.0012	0.0006	0.0006
Cr	(0.005)*	0.007	0.0257	0.003	0.006	0.005	0.0637	0.009	0.003	0.011	0.009	0.0106	0.005	0.1263	0.002	0.007	0.0201	0.0020	0.006	0.004	0.0020
Pb	(0.004)*	0.02	0.138	0.006	0.063	0.019	0.012	0.061	0.011	0.031	0.034	0.024	0.007	0.328	0.008	0.05	0.014	0.007	0.162	0.021	0.006
Hg	(0.001)*	0.0001	0.0001	0.0001	0.0003	0.0001	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0001	0.0023	0.0001	0.0001	0.0002	0.0001	0.0001
Se	(0.01)$	0.0026	0.0076	0.0034	0.0016	0.0016	0.0031	0.0022	0.0016	0.0024	0.0017	0.0022	0.0016	0.022	0.0016	0.0024	0.011	0.0016	0.0054	0.0058	0.0016
B	(2)*	0.23	0.56	0.23	0.28	0.84	2.85	0.85	0.83	0.7	1.07	1.22	0.23	1.75	0.23	0.23	0.46	0.23	0.46	0.23	0.23
Cu	(0.028)*	0.023	0.158	0.009	0.012	0.01	0.012	0.035	0.009	0.017	0.023	0.011	0.009	0.175	0.009	0.016	0.018	0.009	0.018	0.012	0.009
Ni	(0.05)*	0.014	0.054	0.009	0.01	0.015	0.032	0.02	0.014	0.016	0.026	0.028	0.008	0.124	0.047	0.016	0.008	0.011	0.027	0.009	0.011
Zn	(0.008)*	0.225	0.402	0.03	0.157	0.07	0.143	0.09	0.06	0.05	0.164	0.06	0.08	0.514	0.03	0.09	0.04	0.03	0.213	0.09	0.03
CN	(0.05)$	0.009	0.009	0.009	0.013	0.009	0.009	0.009	0.009	0.009	0.009	0.01	0.009	0.009	0.009	0.009	0.009	0.011	0.009	0.009	0.009
SO_4	(400)*	86.5	3.9	23.8	1.7	40.7	39.4	31.7	168	156	45.3	114	19.8	99.7	592	64.2	16.1	194	725	2140	544
Conductivity	(1500)$ uS/cm	1410	2910	571	1320	2420	6340	3150	2890	2810	3370	4430	371	906	1590	835	244	1070	1330	2630	1080
NH_3-N	(0.015)*	0.27	43.4	0.27	11.4	117	355	168	107	106	155	217	0.27	0.74	1.58	0.27	0.27	0.27	0.27	0.27	0.27
BOD 5day	4	1	36	1	19	9	36	25	16	29	23	32	6	65	5	19	4	6	8	7	1
COD	250	232	965	-	440	213	910	335	209	335	340	519	264	2460	-	630	-	238	85	132	72
Nitrate	(50)$	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1	0.6	0.4	0.4	0.4
Nitrite	0.1($)	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.057	0.025	0.025	0.025	0.025	0.025
Chloride	250*	235	709	5.61	124	139	1000	330	193	179	298	474	22.6	16.4	12.7	7.13	5.97	24.1	8.84	9.57	5.56

Determinand	Surface Water SW1	SW2	SW3 ■	SW4	SW5	SW6
	Landfill pond	Glebe Lake	Inn on the Pond	Mercer Lake	Angling Pond	East Angling Pond
pH	8.20	7.70	7.30	7.70	7.90	7.80
As	0.0020	0.0014	0.0039	0.0014	0.0014	0.0043
Cd	0.0006	0.0006	0.0006	0.0006	0.0006	0.0006
Cr	0.0020	0.0020	0.003	0.0020	0.0020	0.0020
Pb	0.006	0.006	0.016	0.006	0.006	0.006
Hg	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Se	0.0016	0.0016	0.0016	0.0016	0.0016	0.0016
B	0.23	0.23	0.23	0.23	0.23	0.23
Cu	0.009	0.009	0.025	0.009	0.009	0.009
Ni	0.003	0.003	0.008	0.003	0.003	0.003
Zn	0.018	0.018	0.125	0.02	0.018	0.08
CN	0.009	0.009	0.009	0.009	0.009	0.009
SO_4	19.8	45.5	38.2	45.5	47	57
Conductivity	405	261	545	262	431	572
NH_3-N	0.27	0.27	0.45	0.27	0.27	0.27
BOD 5day	2	1	15	1	3	4
COD	52	20	318	15	33	95
Nitrate	0.4	0.4	0.4	0.4	0.4	0.4
Nitrite	0.025	0.025	0.025	0.025	0.025	0.025
Chloride	11.6	11.4	82.7	11	11.4	22.2

Key		Source of Guidance Trigger Level	
(yellow)	Highlighted cells - value e eecds Tier 1 Screening Concentration		Freshwater Environmental uality Standard
-	Parameter not tested for due to sample interference		Water Supply (Water uality) Regulations 1989, as amended (UK Drinking Water Standard)
ND	None Detected		

GW	Groundwater
L	Leachate

■ Dense vegetation and resticted access permitted sample to only be obtained from pond margin. Sample noted to be contaminated by organic and ano ic pond sediments

L N S

2 S O

G S W O 2011 D 2012

All results e pressed as ug/l unless otherwise stated

O ND 1 O O E 2011

D	L	A										E		
		BH1	BH3	BH4	BH14	BH6	BH7	BH15	BH16 (D)	BH16 (S)	BH17 (D)	BH31	BH11	BH24	BH26
		GW	L	L	L	L	L	L	GW	L	GW	L	GW	GW	GW
	0	0.41	0.89	0.12	0.93	2.21	1.24	4.43	2.72	2.23	1.95	3.05	0.10	0.10	10.5
	0	0.34	0.36	0.10	0.24	3.21	1.38	0.67	0.42	0.34	0.27	0.71	0.10	0.10	9.1
E	00 *	0.21	0.19	0.10	0.51	24.1	19.6	7.22	1.32	1.17	0.17	6.8	0.10	0.10	3.56
	0	0.20	0.46	0.20	1.15	44.8	13	41.3	1.92	1.44	2.75	12.2	0.20	0.20	23.4
P	0	1.0	8.8	1.0	2.0	10.0	14.9	10.0	2.0	1.0	2.0	10.0	1.0	1	43.1
PAH N	10	1.0	1.0	1.0	8.7	10	13.9	11.6	6.2	8.6	10.3	29.1	1.0	1.0	521
P	0 01	1.0	1.0	1.0	2.0	10.0	10.0	10.0	2.0	1.0	2.0	10.0	1.0	1.0	1.0
GO 10	10	13	10	10	158	119	121	24	14	40	136	10	72	71	
PH DO 10 20	10	10	10	28	62	59	65	47	49	196	902	10	10	1437	
LO 20 4	10	21	10	14	52	21	59	65	47	20	20	59	10	10	100
O		2.1	ND	ND	2.7	21.6	16.5	27.7	11.3	5.8	14.9	29.1	ND	1.8	13.2
SO		3.0	3.9	ND	11.5	47.7	17.3	10.8	2.3	4.3	3.2	103	ND	ND	ND
P	0	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P H	0 1	ND	ND	ND	0.023	0.064	0.23	0.067	0.02	0.039	0.009	0.06	ND	0.01	ND

S W				
SW1	SW2	SW3	SW4	SW5
Landfill pond	Glebe Lake	Inn on the Pond	Mercer Lake	Angling Pond
0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10
0.20	0.20	0.20	0.20	0.20
1.0	1.0	1.0	1.0	1.0
1.0	1.0	1.0	1.0	1.0
1.0	1.0	1.0	1.0	1.0
10	10	10	10	10
10	10	10	10	10
10	10	10	10	10
ND	ND	ND	ND	ND
ND	ND	ND	ND	ND
ND	ND	ND	0.01	ND

O ND 2 NO EM E 2011

D	L	A										E		
		BH1	BH3	BH4	BH14	BH6	BH7	BH15	BH16 (D)	BH16 (S)	BH17 (D)	BH31	BH11	BH26	BH27
		GW	L	L	L	L	L	L	GW	L	GW	L	GW	GW	GW
	0	0.25	0.87	0.10	0.76	2.18	1.32	4.15	0.71	2.64	1.19	2.64	0.10	1.21	0.10
	0	0.24	0.15	0.10	0.31	5.7	1.28	1.55	0.12	0.58	0.10	0.71	0.10	1.54	0.10
E	00 *	0.27	0.29	0.10	0.5	21.9	19	18.5	0.10	0.93	0.10	7.83	0.10	0.8	0.10
	0	0.2	0.79	0.2	1.04	51.28	11.99	72.2	0.63	2.0	0.4	14.57	0.2	4.34	0.2
P	0	1.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	10.0	1.0	10.0	1.0	1.0	1.0
PAH N	10	1.0	1.0	1.0	5.6	15.6	18	10.5	1.0	7.9	4.0	242	2.0	345	1.0
P	0 01	1.0	1.0	1.0	4.0	4.0	2.0	2.0	1.0	10.0	1.0	10.0	1.0	1.0	1.0
GO 10	10	10	10	10	228	166	296	14	13	32	156	10	10	10	
PH DO 10 20	10	10	10	56	187	167	67		181	63	1053	10	594	12	
LO 20 4	10	27	10	10	40	167	101		47	63	248	10	10	10	
O		4.0	1.8	ND	1.7	204.5	34.8	55.8	4.5	24.6	ND	62.3	ND	2.7	ND
SO		ND	1.1	ND	ND	36.9	11.4	9.9	2.2	ND	ND	72.3	ND	ND	ND
P	0	ND	ND	ND	0.003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P H	0 1	ND	ND	ND	0.012	0.016	0.015	0.094	0.03	0.029	0.127	0.05	ND	ND	ND

S W				
SW1	SW2	SW3	SW4	SW5
Landfill pond	Glebe Lake	Inn on the Pond	Mercer Lake	Angling Pond
0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.21	0.10	0.10
0.10	0.10	0.10	0.10	0.10
0.2	0.2	0.2	0.2	0.2
1.0	1.0	1.4	1.0	1.0
1.0	1.0	2.0	1.0	1.0
1.0	1.0	1.0	1.0	1.0
10	30	10	10	10
10	10	10	40	10
40	10	10	40	10
ND	ND	ND	ND	ND
ND	ND	3.2	ND	ND
ND	ND	ND	ND	ND
ND	ND	ND	ND	ND

O ND E A 2012

D	L	A									E				
		BH1	BH4	BH14	BH6	BH7	BH15	BH16 (S)	BH17 (D)	BH31	BH21	BH11	BH24	BH26	BH27
		GW	L	L	L	L	L	L	GW	L	GW	GW	GW	GW	GW
	0	0.46	0.10	0.83	2.1	0.93	1.62	1.84	1.08	1.2	0.10	0.10	0.10	0.10	0.10
	0	0.41	0.10	0.17	4.76	0.6	1.83	0.27	0.21	0.42	0.10	0.10	0.10	0.12	0.10
E	00 *	0.10	0.10	0.31	4.82	16.7	35	0.39	0.13	3.23	0.10	0.10	0.10	0.10	0.10
	0	0.20	0.20	0.26	12.2	3.49	106	0.94	0.76	5.01	0.20	0.20	0.20	0.16	0.20
P	0	1.0	4.0	1.0	4.0	7.0	4.0	4.0	4.0	1.4	200	1.0	1.0	1.0	1.0
PAH N	10	1.0	1.0	4.0	11.2	10.8	4.0	6.3	4.1	76.3	1.0	1.0	1.0	1.0	1.0
P	0 01	1.0	4.0	1.0	4.0	7.0	4.0	4.0	4.0	1.0	200	1.0	1.0	1.0	1.0
GO 10	10	10	10	10	97	112	206	31	26	231	10	10	10	10	10
PH DO 10 20	10	200	10	36	40	95	40	98	40	379	200	10	40	10	20
LO 20 4	10	200	10	20	40	40	40	40	137	40	200	10	40	10	20
O		3.5	ND	ND	ND	ND	29.9	ND	7.8	8.4	ND	ND	ND	ND	ND
SO		ND	ND	2.5	5.9	8.2	ND	ND	ND	8.0	ND	ND	ND	ND	ND
P	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P H	0 1	ND	ND	0.008	0.024	0.121	0.016	0.028	ND	0.047	ND	ND	ND	ND	ND

S W				
SW1	SW2	SW3	SW4	SW5
Landfill pond	Glebe Lake	Inn on the Pond	Mercer Lake	Angling Pond
0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10
0.20	0.20	0.20	0.20	0.20
1.0	1.0	1.0	2.0	2.0
1.0	1.0	1.0	2.0	2.0
10	10	10	10	10
10	40	10	10	40
ND	ND	ND	ND	ND
ND	ND	ND	ND	ND
ND	ND	ND	ND	ND
ND	ND	ND	0.006	ND

O ND MA 2012

D	L	A									E				
		BH1	BH4	BH14	BH6	BH7	BH15	BH16 (S)	BH17 (S)	BH31	BH21	BH11	BH24	NH26	BH27
		GW	L	L	L	L	L	L	L	L	GW	GW	GW	GW	GW
	0	0.47	0.10	0.31	2.05	0.65	3.38	1.55	1.79	1.73	DR	0.10	DR	0.10	0.10
	0	0.39	0.10	0.16	0.84	0.47	2.79	0.25	0.27	0.51		0.10		0.10	0.10
E	00 *	0.11	0.10	0.2	2.73	7.53	34.8	0.76	0.2	3.82		0.10		0.10	0.10
	0	0.20	0.20	0.20	13.1	1.41	103	0.72	1.58	4.75		0.10		0.20	0.20
P	0	4.0	1.0	10.0	20.0	20.0	10.0	10.0	10.0	1.0		1.0		1.0	1.0
PAH N	10	0.02	0.04	0.04	1.79	0.04	0.091	6.3	7.2	62.6		0.01		0.04	0.04
P	0 01	4.0	1.0	10.0	20.0	20.0	10.0	10.0	10.0	1.0		1.0		1.0	1.0
GO 10	10	10	10	10	125	138	287	18	80	136		10		10	10
PH DO 10 20	10	20	10	42	40	40	40	40	40		13		40	20	10
LO 20 4	10	20	10	40	40	40	20	65	40		13		40	20	10
O		ND	ND	ND	37.2	ND	79.4	4.1	20.4	10		ND		ND	ND
SO		ND	ND	ND	ND	ND	ND	ND	ND	ND		ND		ND	ND
P	0	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND		ND	ND
P H	0 1	ND	ND	ND	ND	ND	0.031	ND	ND	ND		ND		ND	ND

S W				
SW1	SW2	SW3	SW4	SW5
Landfill pond	Glebe Lake	Inn on the Pond	Mercer Lake	Angling Pond
0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10
0.10	0.10	0.10	0.10	0.10
0.20	0.20	0.20	0.20	0.20
2.0	1.0	1.0	1.0	1.0
1.0	0.04	0.01	0.01	0.02
2.0	1.0	1.0	1.0	1.0
10	10	10	10	10
10	10	10	10	10
10	10	10	20	10
ND	ND	ND	ND	ND
ND	ND	ND	ND	ND
ND	ND	ND	ND	ND

O ND SEP EM E 2012 N O A

O ND DE EM E 2012

D	L	A											D	E				
		BH1	BH3	BH4	BH14	BH6	BH7	BH15	BH16 (S)	BH16 (D)	BH17 (D)	BH31	BH21	BH18	BH11	BH12	BH24	BH26
		GW	L	L	L	L	L	L	L	GW	GW	L	GW	L	GW	GW	GW	GW
	0	0.14	1.73	0.10	6.56	2.24	0.99	4.3	1.14	1.5	2.13	2.19	0.10	0.10	0.10	0.10	0.10	0.10
	0	0.10	0.39	0.10	0.50	0.7	1.16	1.7	0.19	0.14	0.36	2.35	0.10	0.10	0.10	0.10	0.10	0.10
E	00 *	0.10	0.7	0.10	0.50	1.0	2.58	35	0.23	0.10	0.50	5.32	0.10	0.10	0.10	0.14	0.10	0.10
	0	0.20	1.1	0.20	1.00	6.9	1.00	97.9	0.40	0.20	1.00	15.2	0.20	0.20	0.20	0.20	0.20	0.20
P	0	1.0	10.0	1.0	2.0	20.0	20.0	2.0	20.0	10.0	10.0	11.7	1.0	2.0	1.0	1.0	1.0	1.0
PAH N	10	1.0	3.8	1.0	3	12.6	4.0	4.7	4.0	1.0	5.3	4.0	1.0	1.0	1.0	1.6	1.0	1.0
P	0 01	1.0	10.0	1.0	2.0	20.0	20.0	2.0	20.0	10.0	10.0	10.0	1.0	2.0	1.0	1.0	1.0	1.0
GO 10	10	13	10	10	57	60	211	10	10	10	98	111	10	10	10	10	10	10
PH DO 10 20	10	10	101	10	20	55	50	30	50	47	30	43	10	20	10	20	10	10
LO 20 4	10	10	20	10	20	50	50	219	50	20	20	20	10	20	10	20	10	10
O		ND	14.9	ND	ND	36.3	4.8	53.8	4.3	7.6	12.9	16.6	ND	ND	ND	ND	ND	ND
SO		5.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P	0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
P H	0 1	ND	ND	ND	0.025	0.035	0.065	0.072	0.019	0.026	0.025	0.157	ND	ND	ND	ND	ND	ND

S W						
SW1	SW2	SW3 ■	SW4	SW5	SW6	
Landfill pond	Glebe Lake	Inn on the Pond	Mercer Lake	Angling Pond	East Angling Pond	
0.10	0.10	0.10	0.10	0.10	0.10	
0.10	0.10	0.10	0.10	0.10	0.10	
0.10	0.10	0.10	0.10	0.10	0.10	
0.20	0.20	0.20	0.20	0.20	0.20	
1.0	1.0	1.0	1.0	1.0	1.0	
1.0	1.0	1.0	1.0	1.0	1.0	
1.0	1.0	1.0	1.0	1.0	1.0	
10	10	10	10	10	10	
10	10	20	10	10	10	
10	10	20	10	10	10	
ND	ND	ND	ND	ND	ND	
ND	ND	ND	ND	ND	ND	
ND	ND	ND	ND	ND	ND	
ND	ND	ND	ND	ND	ND	

	S G L
Highlighted cells - value e eeds Tier 1 Screening Concentration	Freshwater Environmental uality Standard
Blank cells - parameter not tested for	Water Supply (Water uality) Regulations 1989, as amended (UK Drinking Water Standard)
ND None Detected	♣ WHO Guidelines for Drinking Water uality
	US Drinking Water Standard

GW	Groundwater
L	Leachate

■ Dense vegetation and restricted access permitted sample to only be obtained from pond margin. Sample noted to be contaminated by organic and ano ic pond sediments