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QTS Environmental Report No: 15-30141

Site Reference: Lawrence Landfill

Project / Job Ref: None Supplied

Order No: None Supplied

Sample Receipt Date: 23/03/2015

Sample Scheduled Date: 27/03/2015

Report Issue Number: 1

Reporting Date: 02/04/2015

Authorised by:

Russell Jarvis
Director

On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director

On behalf of QTS Environmental Ltd



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Water Analysis Certificate						
QTS Environmental Report No: 15-30141	Date Sampled	19/03/15				
Track Environmental Consultancy Ltd	Time Sampled	None Supplied				
Site Reference: Lawrence Landfill	TP / BH No	Water Discharge				
Project / Job Ref: None Supplied	Additional Refs	None Supplied				
Order No: None Supplied	Depth (m)	None Supplied				
Reporting Date: 02/04/2015	QTSE Sample No	142566				

Determinand	Unit	RL	Accreditation				
pH	pH Units	N/a	ISO17025	7.7			
Total Cyanide	ug/l	< 5	NONE	< 5			
Sulphate as SO ₄	mg/l	< 1	ISO17025	45			
Sulphide	mg/l	< 0.1	NONE	< 0.1			
Total Organic Carbon (TOC)	mg/l	< 0.1	NONE	8.9			
Arsenic (dissolved)	ug/l	< 5	ISO17025	< 5			
Boron (dissolved)	ug/l	< 5	ISO17025	11			
Cadmium (dissolved)	ug/l	< 0.4	ISO17025	< 0.4			
Chromium (dissolved)	ug/l	< 5	ISO17025	5			
Copper (dissolved)	ug/l	< 5	ISO17025	< 5			
Lead (dissolved)	ug/l	< 5	ISO17025	< 5			
Mercury (dissolved)	ug/l	< 0.05	ISO17025	< 0.05			
Nickel (dissolved)	ug/l	< 5	ISO17025	< 5			
Selenium (dissolved)	ug/l	< 5	ISO17025	< 5			
Zinc (dissolved)	ug/l	< 2	ISO17025	< 2			
Total Phenols (monohydric)	ug/l	< 0.5	NONE	< 0.5			
EPH (C10 - C40)	ug/l	< 10	NONE	< 10			

Subcontracted analysis ^(S)
Insufficient sample ^{I/S}
Unsuitable Sample ^{U/S}



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Water Analysis Certificate - Speciated PAH						
QTS Environmental Report No: 15-30141	Date Sampled	19/03/15				
Track Environmental Consultancy Ltd	Time Sampled	None Supplied				
Site Reference: Lawrence Landfill	TP / BH No	Water Discharge				
Project / Job Ref: None Supplied	Additional Refs	None Supplied				
Order No: None Supplied	Depth (m)	None Supplied				
Reporting Date: 02/04/2015	QTSE Sample No	142566				

Determinand	Unit	RL	Accreditation				
Naphthalene	ug/l	< 0.01	NONE	< 0.01			
Acenaphthylene	ug/l	< 0.01	NONE	< 0.01			
Acenaphthene	ug/l	< 0.01	NONE	< 0.01			
Fluorene	ug/l	< 0.01	NONE	< 0.01			
Phenanthrene	ug/l	< 0.01	NONE	< 0.01			
Anthracene	ug/l	< 0.01	NONE	< 0.01			
Fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Pyrene	ug/l	< 0.01	NONE	< 0.01			
Benzo(a)anthracene	ug/l	< 0.01	NONE	< 0.01			
Chrysene	ug/l	< 0.01	NONE	< 0.01			
Benzo(b)fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Benzo(k)fluoranthene	ug/l	< 0.01	NONE	< 0.01			
Benzo(a)pyrene	ug/l	< 0.01	NONE	< 0.01			
Indeno(1,2,3-cd)pyrene	ug/l	< 0.01	NONE	< 0.01			
Dibenz(a,h)anthracene	ug/l	< 0.01	NONE	< 0.01			
Benzo(ghi)perylene	ug/l	< 0.01	NONE	< 0.01			
Total EPA-16 PAHs	ug/l	< 0.01	NONE	< 0.01			



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Water Analysis Certificate - TPH CWG Banded						
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Track Environmental Consultancy Ltd	Time Sampled	None Supplied				
Site Reference: Lawrence Landfill	TP / BH No	Water Discharge				
Project / Job Ref: None Supplied	Additional Refs	None Supplied				
Order No: None Supplied	Depth (m)	None Supplied				
Reporting Date: 02/04/2015	QTSE Sample No	142566				

Determinand	Unit	RL	Accreditation				
Aliphatic >C5 - C6	ug/l	< 10	NONE	< 10			
Aliphatic >C6 - C8	ug/l	< 10	NONE	< 10			
Aliphatic >C8 - C10	ug/l	< 10	NONE	< 10			
Aliphatic >C10 - C12	ug/l	< 10	NONE	< 10			
Aliphatic >C12 - C16	ug/l	< 10	NONE	< 10			
Aliphatic >C16 - C21	ug/l	< 10	NONE	< 10			
Aliphatic >C21 - C34	ug/l	< 10	NONE	< 10			
Aliphatic (C5 - C34)	ug/l	< 70	NONE	< 70			
Aromatic >C5 - C7	ug/l	< 10	NONE	< 10			
Aromatic >C7 - C8	ug/l	< 10	NONE	< 10			
Aromatic >C8 - C10	ug/l	< 10	NONE	< 10			
Aromatic >C10 - C12	ug/l	< 10	NONE	< 10			
Aromatic >C12 - C16	ug/l	< 10	NONE	< 10			
Aromatic >C16 - C21	ug/l	< 10	NONE	< 10			
Aromatic >C21 - C35	ug/l	< 10	NONE	< 10			
Aromatic (C5 - C35)	ug/l	< 70	NONE	< 70			
Total >C5 - C35	ug/l	< 140	NONE	< 140			



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Water Analysis Certificate - BTEX / MTBE						
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Site Reference: Lawrence Landfill	TP / BH No	Water Discharge				
Project / Job Ref: None Supplied	Additional Refs	None Supplied				
Order No: None Supplied	Depth (m)	None Supplied				
Reporting Date: 02/04/2015	QTSE Sample No	142566				

Determinand	Unit	RL	Accreditation				
Benzene	ug/l	< 1	ISO17025	< 1			
Toluene	ug/l	< 5	ISO17025	< 5			
Ethylbenzene	ug/l	< 5	ISO17025	< 5			
p & m-xylene	ug/l	< 10	ISO17025	< 10			
o-xylene	ug/l	< 5	ISO17025	< 5			
MTBE	ug/l	< 10	ISO17025	< 10			



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Soil Analysis Certificate - Methodology & Miscellaneous Information	
QTS Environmental Report No: 15-30141	
Track Environmental Consultancy Ltd	
Site Reference: Lawrence Landfill	
Project / Job Ref: None Supplied	
Order No: None Supplied	
Reporting Date: 02/04/2015	

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Water	UF	Alkalinity	Determination of alkalinity by titration against hydrochloric acid using bromocresol green as the end point	E103
Water	UF	BTEX	Determination of BTEX by headspace GC-MS	E101
Water	F	Cations	Determination of cations by filtration followed by ICP-MS	E102
Water	UF	Chemical Oxygen Demand (COD)	Determination using a COD reactor followed by colorimetry	E112
Water	F	Chloride	Determination of chloride by filtration & analysed by ion chromatography	E109
Water	F	Chromium - Hexavalent	Determination of hexavalent chromium by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E116
Water	UF	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E115
Water	UF	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E115
Water	UF	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through liquid:liquid extraction with cyclohexane	E111
Water	F	Diesel Range Organics (C10 - C24)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	Dissolved Organic Content (DOC)	Determination of DOC by filtration followed by low heat with persulphate addition followed by IR detection	E110
Water	UF	Electrical Conductivity	Determination of electrical conductivity by electrometric measurement	E123
Water	F	EPH (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID	E104
Water	F	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of liquid:liquid extraction with hexane followed by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E104
Water	F	Fluoride	Determination of Fluoride by filtration & analysed by ion chromatography	E109
Water	F	Hardness	Determination of Ca and Mg by ICP-MS followed by calculation	E102
Leachate	F	Leachate Preparation - NRA	Based on National Rivers Authority leaching test 1994	E301
Leachate	F	Leachate Preparation - WAC	Based on BS EN 12457 Pt1, 2, 3	E302
Water	F	Metals	Determination of metals by filtration followed by ICP-MS	E102
Water	F	Mineral Oil (C10 - C40)	Determination of liquid:liquid extraction with hexane followed by GI-FID	E104
Water	F	Nitrate	Determination of nitrate by filtration & analysed by ion chromatography	E109
Water	UF	Monohydric Phenol	Determination of phenols by distillation followed by colorimetry	E121
Water	F	PAH - Speciated (EPA 16)	Determination of PAH compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E105
Water	F	PCB - 7 Congeners	Determination of PCB compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E108
Water	UF	Petroleum Ether Extract (PEE)	Gravimetrically determined through liquid:liquid extraction with petroleum ether	E111
Water	UF	pH	Determination of pH by electrometric measurement	E107
Water	F	Phosphate	Determination of phosphate by filtration & analysed by ion chromatography	E109
Water	UF	Redox Potential	Determination of redox potential by electrometric measurement	E113
Water	F	Sulphate (as SO4)	Determination of sulphate by filtration & analysed by ion chromatography	E109
Water	UF	Sulphide	Determination of sulphide by distillation followed by colorimetry	E118
Water	F	SVOC	Determination of semi-volatile organic compounds by concentration through SPE cartridge, collection in dichloromethane followed by GC-MS	E106
Water	UF	Toluene Extractable Matter (TEM)	Gravimetrically determined through liquid:liquid extraction with toluene	E111
Water	UF	Total Organic Carbon (TOC)	Low heat with persulphate addition followed by IR detection	E110
Water	F	TPH CWG (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C35. C5 to C8 by headspace GC-MS	E104
Water	F	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of liquid:liquid extraction with hexane, fractionating with SPE followed by GC-FID for C8 to C44. C5 to C8 by headspace GC-MS	E104
Water	UF	VOCs	Determination of volatile organic compounds by headspace GC-MS	E101
Water	UF	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E101

Key

F Filtered
UF Unfiltered