# Attachment 4.8.2 – Baseline Report

Organisation Name: *	Knockharley Landfill Limited
Application I.D.: *	LA004307



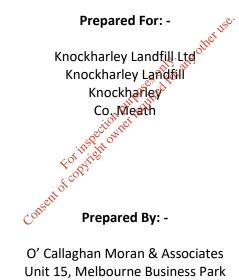
Unit 15 Melbourne Business Park Model Farm Road Cork T12 WR898



T: 021 434 5366 E: admin@ocallaghanmoran.com www.ocallaghanmoran.com

### **BASELINE ASSESSMENT REPORT**

# KNOCKHARLEY LANDFILL



Unit 15, Melbourne Business Park Model Farm Road Cork

September 2019

Project	Baseline Assessment Report Knockharley Landfill											
Client	Knockharley L	Knockharley Landfill Ltd										
Report No	Date	Status	Prepared By	Reviewed By								
	10/07/2019	Draft	Billy Hamilton	Jim O'Callaghan								
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	10/08/2019											
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#### 1. INTRODUCTION

Knockharley Landfill Ltd (KLL) operates under an Industrial Emissions Licence (IE) (Reg No. W0146-02) issued by the Environmental Protection Agency (the Agency). The licence authorises the acceptance of 200,000 tonnes of non-hazardous waste annually for disposal and recovery.

It is proposed to increase the annual waste acceptance rate to 435,000 tonnes, which will comprise up to 150,000 tonnes of incinerator bottom ash (IBA), as well as municipal solid wastes, including organic fines, non-hazardous contaminated soils, construction and demolition (C&D) wastes and baled recyclables.

5,000 tonnes per annum of stable non-reactive hazardous waste will also be accepted for co-disposal with the non-hazardous wastes. The IBA will be pre-treated and temporarily stored in dedicated landfill cells. The residual organic fines will be treated in a new on-site biological treatment plant, with the treated solid outputs used as daily cover. A leachate treatment plant will be installed to pre-treat leachate from the non-hazardous waste cells, the IBA cells and the biological treatment plant.

The proposed change requires a revision of the IE licence. An review application for an activity that involves the use, production or release of relevant hazardous substances (as defined in Section 3 of the EPA Act 1992 as amended), may require the preparation of a Baseline Report' under Article 22(2) of Directive 2010/75/EU on industrial emissions 2014/C 136/03, the objective of which is to establish pour purposited for the status of the soil and groundwater conditions.

### 1.1 Methodology

OCM's assessment was based on information in the Environmental Impact Assessment Report (EIAR) prepared in support of the licence review application and an assessment of the quality of the leachate generated in the landfill and followed the guidance in Part 5 of the European Commission Guidance Con concerning baseline reports.

## 2. STAGE 1 & 2 HAZARDOUS SUBSTANCES

## 2.1 Stage 1: Hazardous Substances Currently Used, Produced and Released

Current operations involve the use of diesel fuelled mobile plant and equipment. Lubricating and hydraulic oils are used in plant maintenance. Diesel and lubricating oils are recognised hazardous substances. Leachate is generated in the landfill cells due to the infiltration of rain through the waste mass and it contains a wide range of organic and inorganic substances that are classified as hazardous. It is proposed to accept 5,000 tonnes of non-reactive hazardous waste that may contain hazardous substances.

# 2.2 Stage 2: Relevant Hazardous Substances

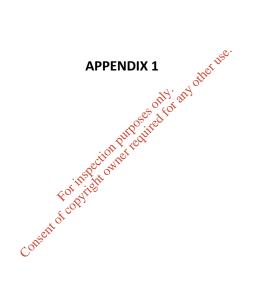
The diesel is stored in a 6,000 litre tank provided with a containment bund. The bund design meets the specification in Condition 3.11 (W0146-1). The lubricating oils (ca 400 litres) are stored in a bunded pallet inside the plant maintenance shed.

KLL implements an operational procedure (EMS-OP-05 Fuel Storage and Distribution (Rev 004) to minimise the risk of accidental spills associated with diesel/oil handling and storage and to ensure that where such releases occur they are contained and cleaned up. This, in conjunction with the relatively small amounts onsite at any one time, means that diesel/oil are not relevant hazardous substances.

The stable non-reactive hazardous wastes, by their nature, will have the same leaching characteristic as the non-hazardous waste and therefore are not considered to be relevant hazardous substances.

Currently the leachate produced in each Cell is collected and pumped to a holding lagoon pending removal off site in road tankers for treatment in municipal wastewater treatment plants. The leachate is classed as non-hazardous.

In 2018 KLL undertook an assessment of the quality of the leachate arising at the installation to confirm it was suitable for treatment at an Irish Water municipal wastewater treatment plant. The assessment was based on the results of the routine analysis conducted in accordance with the licence requirements and additional parameters requested by Irish Water to identify and quantify 'priority substances'. The report on the assessment is in Appendix 1. While hazardous substances were detected, the levels were so low they do not present any significant environmental risk and therefore leachate is not considered to be a relevant hazardous substance.



Unit 15 Melbourne Business Park Model Farm Road Cork



# T: 021 434 5366

E:info@ocallaghanmoran.com www.ocallaghanmoran.com

# LEACHATE ASSESSMENT

# KNOCKHARLEY LANDFILL



O' Callaghan Moran & Associates, Unit 15 Melbourne Business Park, Model Farm Road, Cork.

11 May 2018

Project	Knockharley	Knockharley Landfill Leachate Suitability Assessment											
Client	Knockharley	Knockharley Landfill Ltd											
	W0146-02												
Report No.	Date	Status	Prepared By	Reviewed By									
2110401	04/05/2018	Draft	Neil Sandes PGeo	Jim O'Callaghan MSc									
	11/05/2018	Final	ther										
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# **APPENDIX 1**

**APPENDIX 2** 

Routine Leachate Monitoring Results Laboratory Report: Priority Substances Consent of copyright owner require

# **1 1 INTRODUCTION**

Knockharley Landfill Limited (KLL) appointed O'Callaghan Moran & Associates (OCM) to undertake an assessment of the quality of the leachate arising at the Knockharley Landfill in the context of the proposal to consign the leachate to an Irish Water municipal wastewater treatment plant for treatment.

# 1.1 1.1 Methodology

The assessment was based on the results of the laboratory analysis of representative samples of the leachate carried out in compliance with the EPA licence requirements additional analysis conducted in response to a request by Irish Water to identify and quantify 'priority substances'. The assessment took into consideration the following publications:

- EPA Research Report No. 214 'Suitability of Municipal Wastewater Treatment Plants for the Treatment of Landfill Leachate' and S
- EPA 'Guidance on the Screening for Priority Substances for Waste Water Discharge Licences'
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#### 2 LEACHATE ANALYSIS

#### 2.1 Landfill Development

Knockharley Landfill is a non-hazardous residual landfill that opened in 2004 and has been developed in a series of phases comprising engineered landfill cells. Once the final levels have been reached in the cells in each phase they are covered with a low permeability capping layer to minimise leachate generation. The capping sequence is as follows:

Phase 1: 2009 Phase 2: 2012 Phase 3: 2012 to 2013 Phase 4: 2016 Phase 5: 2017.

#### 2.2 Leachate Management System

outh, any other rise. Leachate produced within each landfill cell is conjected in a sump from where it is pumped to a lined and covered holding lagoon. The lagoon acts as an equalising tank, where leachate from all of the different landfill cells are mixed. Consent of copyright

#### 2.3 Leachate Quality

The IE Licence requires regular monitoring of the leachate for the parameters specified in Table D5.1. The results of the monitoring carried out on the leachate from the landfill cells and the lagoon between Q1 2017 and Q2 2018 are in Appendix 1. The results indicate that the leachate in the lagoon falls into the Young Classification.<sup>1</sup>

#### 2.4 **Priority Substances**

The monitoring carried out in accordance with the licence requirements does not include all of the substances listed in the EPA document 'Guidance on the Screening for Priority Substances for Waste Water Discharge Licences.' Therefore further analysis was carried out for the parameters listed in Table 2.1.

<sup>&</sup>lt;sup>1</sup> EPA Research Report No. 214 'Suitability of Municipal Wastewater Treatment Plants for the Treatment of Landfill Leachate'

# Table 2.1 Parameters to be screened for Wastewater Discharges<sup>2</sup>

Parameter Required	Group	Parameter Required	Group
Benzene		Linuron	
Carbon tetrachloride		Dichlobenil	Pesticides
1,2-Dichloroethane		2,6-Dichlorobenzamide	
Dichloromethane		PCBs	PCBs
Tetrachloroethylene		Phenols (as Total C)	Phenols
Trichloroethylene	VOCs	Lead	
Trichlorobenzenes		Arsenic	
Trichloromethane		Copper	
Xylenes (all isomers):		Zinc	
Ethyl Benzene		Cadmium	
Toluene		Mercury	
Naphthlene		Chromium	
Fluoranthene		Selenium	Metals
Benzo[k]fluoranthene		Antimony	Wetais
Benzo[ghi]perylene	PAHs	Molybdenum	
Indeno[1,2,3-c,d]pyrene		Tin	
Benzo[b]fluoranthene		Barium Borony, and other Cobalto	
Benzo[a]pyrene		Borony	
Di(2-ethylhexyl)phthalate (DEHP)	Plasticiser	Cobalto	
Isodrin		Naradium	
Dieldrin	tion	Nickel	
Diuron	inspectown	Fluoride	
Isoproturon	FOLITION	Chloride	
Atrazine	For inspection for inspection spectrom for inspection for inspecti	ТОС	
Simazine si	Pesticides	Cyanide	General
Glycophosate		Conductivity	
Mecoprop		Hardness	
2,4-D		рН	
МСРА			

The laboratory report is in Appendix 2 and results are presented in Table 2.2.

# 2.5 Discussion

The general leachate quality parameters indicate the leachate is in the Young Classification and therefore should be suitable for co-treatment at a municipal wastewater treatment plant, as per the recommendations of the EPA Research Report No. 214.

An assessment of the significance of the presence and concentration of priority substances in the leachate is dependent of the total loading of these substances on the wastewater treatment plant where the leachate will be treated and the assimilative capacity of the water course into which the treated effluent is discharged.

 $<sup>^2\,\,{\</sup>rm EPA}$  'Guidance on the Screening for Priority Substances for Waste Water Discharge Licences'

# Table 2.2 Priority Substances

Parameter	Group	Units	Result	Parameter	Group	Units	EQS
Benzene		μg/l	3.9	Linuron		μg/l	NE
Carbon tetrachloride		μg/l	<2	Dichlobenil	Pesticides	μg/l	NE
1,2-Dichloroethane		μg/l	<2	2,6-Dichlorobenzamide		μg/l	NE
Dichloromethane		μg/l	<5	PCBs	PCBs	μg/l	NE
Tetrachloroethylene		μg/l	<3	Phenols (as Total C)	Phenols	μg/l	8
Trichloroethylene	VOCs	μg/l	<3	Lead		μg/l	1.2
Trichlorobenzenes		μg/l	<3	Arsenic		μg/l	20
Trichloromethane		μg/l	<2	Copper		μg/l	5
Xylenes (all isomers):		μg/l	27	Zinc		μg/l	8
Ethyl Benzene		μg/l	11	Cadmium	(1) <sup>50.</sup>	μg/l	0.2
Toluene		μg/l	47	Cadmium Mercury off Chromium off Selenium off Antimonyour office		μg/l	NE
Naphthlene		μg/l	<10	Chromium of the arr		μg/l	4.7
Fluoranthene		μg/l	<5	Selenium oses die	Metals	μg/l	NE
Benzo[k]fluoranthene		μg/l	<10	Antimony	IVIELAIS	μg/l	NE
Benzo[ghi]perylene	PAHs	μg/l	<5	Molybdenum		μg/l	NE
Indeno[1,2,3-c,d]pyrene		μg/l	<10	Tinnstatt		μg/l	NE
Benzo[b]fluoranthene		μg/l	<10	BaRium		μg/l	NE
Benzo[a]pyrene		μg/l	<10	Boron		μg/l	NE
Di(2-ethylhexyl)phthalate (DEHP)	Plasticiser	μg/l	<50 onse	Cobalt		μg/l	NE
Isodrin		μg/l	<0.02	Vanadium		μg/l	NE
Dieldrin		μg/l	<0.02	Nickel		μg/l	4
Diuron		μg/l	0.11	Fluoride		mg/l	0.5
Isoproturon		μg/l		Chloride		mg/l	NE
Atrazine	Destisides	μg/l	<0.02	тос		mg/l	NE
Simazine	Pesticides	μg/l	<0.04	Cyanide	General	mg/l	0.01
Glycphosate		μg/l	120	Conductivity		μS/cm	
Mecoprop		μg/l	<0.1	Hardness		mg/l	
2,4-D		μg/l	<0.1	рН		units	
МСРА		μg/l	<0.1				

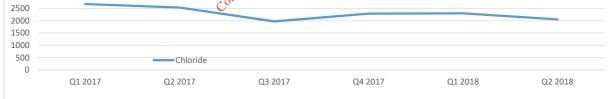
# **APPENDIX 1**

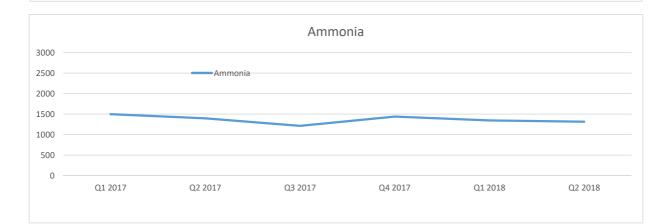
Leachate Results Q1 2019 to Q2 2018

	Units	Q1 2017	Q2 2017	Q3 2017	Q4 2017	Q1 2018	Q2 2018	Averages
рН	units	7.81	7.85	8.02	6,95	7.92	7.76	7.72
EC	μS/cm	18191	20424	19421 💉	20501	21188	18980	19784
Chloride	mg/l	2681	2535	1973 ered	2292	2300	2058	2306
Ammonia	mg/l	1498	1398	1213	1441	1348	1316	1369
BOD	mg/l	556	510	115 Per 112	480	276	512	408
COD	mg/l	4360	2904 🔮	3750 Street and Street	6600	3320	3800	4122
COD/BOD	ratio	0.13	0.18 m	0.03	0.07	0.08	0.13	0.10
TON	mg/l	<0.2	<0.2	<4	<1	<0.2	<0.5	











# **APPENDIX 2**

Laboratory Report

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Unit 3 Deeside Point

Zone 3

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	Deeside Industrial Park Deeside CH5 2UA
O'Callaghan Moran & Associates Unit 15 Melbourne Business Park Model Farm Cork Ireland	Tel: +44 (0) 1244 833780 Fax: +44 (0) 1244 833781
Attention :	Neil Sandes
Date :	20th April, 2018
Your reference :	18-211-04
Our reference :	Test Report 18/4994 Batch 1
Location :	Knockharley Landfill Leachate
Date samples received :	5th April, 2018
Status :	Final report
Issue :	I est Report 18/4994 Batch 1    Knockharley Landfill Leachate    5th April, 2018    Final report    1

One sample was received for analysis on 5th April, 2018 of which one was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections is reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied. All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

**Compiled By:** 

6 June

Bruce Leslie **Project Co-ordinator** 

Exova Jones Enviro													
Client Name:	O'Callagh		& Associat	es			Report :	Liquid					
Reference:	18-211-04		l ocot -t										
Location:	Knockharl		Leachate										
Contact:	Neil Sand	es								-	e, P=plastic	bottle	
JE Job No.:	18/4994				-		H=H <sub>2</sub> SO <sub>4</sub> , .	Z=ZnAc, N=	NaOH, HN=	HN0 <sub>3</sub>	L.		
J E Sample No.	1-10												
Sample ID	Lagoon												
Depth											Please se	e attached n	otes for all
COC No / misc												ations and a	
Containers													
Sample Date	04/04/2018												
Sample Type	Leachate												
Batch Number	1												Mathad
Date of Receipt	05/04/0040										LOD/LOR	Units	Method No.
Dissolved Antimony	53 <sub>AA</sub>										<2	ug/l	TM30/PM14
Dissolved Arsenic	188.0 <sub>AA</sub>										<2.5	ug/l	TM30/PM14
Dissolved Barium	600 <sub>AA</sub>										<3	ug/l	TM30/PM14
Dissolved Boron Dissolved Cadmium	9398 <sub>AA</sub>										<12	ug/l	TM30/PM14 TM30/PM14
Dissolved Cadmium Total Dissolved Chromium	<1.0 <sub>AA</sub>										<0.5	ug/l	TM30/PM14 TM30/PM14
Dissolved Cobalt	440.9 <sub>AA</sub> 32 <sub>AA</sub>			tonsent of							<1.5 <2	ug/l ug/l	TM30/PM14 TM30/PM14
Dissolved Copper											<7		TM30/PM14
Dissolved Lead	<14 <sub>AA</sub> <10 <sub>AA</sub>							. 150.			<7 <5	ug/l ug/l	TM30/PM14 TM30/PM14
Dissolved Mercury	<2 <sub>AA</sub>						ŝ	het			<1	ug/l	TM30/PM14
Dissolved Molybdenum	7 <sub>AA</sub>						A. D				<2	ug/l	TM30/PM14
Dissolved Nickel	201 <sub>AA</sub>					~	offer are				<2	ug/l	TM30/PM14
Dissolved Selenium	<6 <sub>AA</sub>					20 <sup>5</sup> 00	010				<3	ug/l	TM30/PM14
Dissolved Tin	58 <sub>AA</sub>					OUTPOLIN					<5	ug/l	TM30/PM14
Dissolved Vanadium	227.9 <sub>AA</sub>				ic	a traine					<1.5	ug/l	TM30/PM14
Dissolved Zinc	25 <sub>AA</sub>				Dect.	MUC					<3	ug/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	943 <sub>AA</sub>				in the						<1	mg/l	TM30/PM14
				Ŷ	Stre								
VOC TICs	ND			\$	cox.							None	TM15/PM10
				ant o.									
SVOC TICs	See Attached <sub>AC</sub>			ORS								None	TM16/PM30
	1	1	1	1	1	1	L	1			1		1

Client Name:	O'Callagh	an Moran a	& Associat	es			Report :	Liquid					
Reference:	18-211-04	Ļ											
Location:	Knockharl	ey Landfill	Leachate										
Contact:	Neil Sand	es					Liquids/pr	oducts: V	=40ml vial, G	=glass bottl	e, P=plastic	bottle	
JE Job No.:	18/4994						H=H <sub>2</sub> SO <sub>4</sub> , 2	Z=ZnAc, N=	=NaOH, HN=	HN0 <sub>3</sub>			
LE Sampla No	1-10										l		
J E Sample No.	1-10												
Sample ID	Lagoon												
Depth											Please se	e attached n	notes for all
COC No / misc												ations and a	
Containers	VNPG												
Sample Date													
Sample Type	Leachate												
Batch Number	1												Method
Date of Receipt	05/04/2018										LOD/LOR	Units	No.
Pesticides													
Organochlorine Pesticides													
Aldrin	<0.10 <sub>AC</sub>										<0.01	ug/l	TM149/PM3
Alpha-HCH (BHC)	<0.02 <sub>AA</sub>										<0.01	ug/l	TM149/PM3
Beta-HCH (BHC)	<0.20 <sub>AD</sub>										<0.01	ug/l	TM149/PM3
Chlorothalonil	<5.00 <sub>AF</sub>										<0.01	ug/l	TM149/PM3
cis-Chlordane	<0.02 <sub>AA</sub>						ator any o				<0.01	ug/l	TM149/PM3
Delta-HCH (BHC)	<0.10 <sub>AC</sub>							<u>ر</u> ه.			<0.01	ug/l	TM149/PM3
Dieldrin	<0.02 <sub>AA</sub>							arus			<0.01	ug/l	TM149/PM3
Endosulphan I	<0.02 <sub>AA</sub>						ð	(he			<0.01	ug/l	TM149/PM3
Endosulphan II	<0.02 <sub>AA</sub>						and and				<0.01	ug/l	TM149/PM3
Endosulphan sulphate	<0.02 <sub>AA</sub>					ري ا	tot .				<0.01	ug/l	TM149/PM3
Endrin	<0.04 <sub>AB</sub>					100 <sup>50</sup> 1	jo í				<0.01	ug/l	TM149/PM3
Gamma-HCH (BHC)	<0.20 <sub>AD</sub>					Darrollin					<0.01	ug/l	TM149/PM3
Heptachlor	<0.02 <sub>AA</sub>				di.	ret					<0.01	ug/l	TM149/PM3
Heptachlor Epoxide	<0.02 <sub>AA</sub>				se ó	ant.					<0.01	ug/l	TM149/PM3
Hexachlorobenzene	<0.02 <sub>AA</sub>				Thomas						<0.01	ug/l	TM149/PM3
Isodrin	<0.02 <sub>AA</sub>			Ŷ	a yri						<0.01	ug/l	TM149/PM3
o,p'-DDE	<0.02 <sub>AA</sub>			S.	to,						<0.01	ug/l	TM149/PM3
o,p'-DDT	<0.10 <sub>AC</sub>			anto							<0.01	ug/l	TM149/PM3
o,p'-Methoxychlor	<0.10 <sub>AC</sub>			ORSC							<0.01	ug/l	TM149/PM3
o,p'-TDE	<0.02 <sub>AA</sub>			0							<0.01	ug/l	TM149/PM3
p,p'-DDE	<0.02 <sub>AA</sub>										<0.01	ug/l	TM149/PM3
p,p'-DDT	<0.20 <sub>AD</sub>										<0.01	ug/l	TM149/PM3
p,p'-Methoxychlor	<0.40 <sub>AE</sub>										<0.01	ug/l	TM149/PM3
p,p'-TDE	<0.02 <sub>AA</sub>										<0.01	ug/l	TM149/PM3
Pendimethalin	<0.02 <sub>AA</sub>										<0.01	ug/l	TM149/PM3
Permethrin I	<0.10 <sub>AC</sub>										<0.01	ug/l	TM149/PM3
Permethrin II	<0.40 <sub>AE</sub>										<0.01	ug/l	TM149/PM3
Quintozene (PCNB)	<0.02 <sub>AA</sub>										<0.01	ug/l	TM149/PM3
Tecnazene	<0.02 <sub>AA</sub>										<0.01	ug/l	TM149/PM3
Telodrin	<0.02 <sub>AA</sub>										<0.01	ug/l	TM149/PM3
trans-Chlordane	<0.02 <sub>AA</sub>										<0.01	ug/l	TM149/PM3
Triadimefon	<0.02 <sub>AA</sub>										<0.01	ug/l	TM149/PM3
Triallate	<0.02 <sub>AA</sub>										<0.01	ug/l	TM149/PM3
Trifluralin	<0.02 <sub>AA</sub>										<0.01	ug/l	TM149/PM3
Benazolin	<0.1										<0.1	ug/l	TM42/PM3
Bentazone	<0.1										<0.1	ug/l	TM42/PM3
Bromoxynil	<0.1										<0.1		TM42/PM3
Clopyralid	<0.1										<0.1	ug/l	TM42/PM3
4 - CPA												ug/l	TM42/PM3 TM42/PM3
	<0.1										<0.1	ug/l	TM42/PM3 TM42/PM3
2,4-D	<0.1										<0.1	ug/l	
2,4 - DB	<0.1										<0.1	ug/l	TM42/PM3

Exova Jones Enviro													
Client Name:	O'Callagha		& Associat	es			Report :	Liquid					
Reference: Location:	18-211-04 Knockharl		Leachato										
Contact:	Neil Sande	-	Leachale				Liquide/pr		=40ml vial, G	-aloce bottl	o D-plactic	hottlo	
JE Job No.:	18/4994	65							=40mi viai, G =NaOH, HN=	-	e, P=piastic	Dottie	
JE JOD NO	10/4994						п=п <sub>2</sub> 30 <sub>4</sub> ,	Z=ZNAC, N	=NaOn, nin=		h		
J E Sample No.	1-10												
Sample ID	Lagoon												
Depth												e attached n	
COC No / misc											abbrevi	ations and a	cronyms
Containers	VNPG												
Sample Date	04/04/2018												
-													
Sample Type	Leachate												
Batch Number	1										LOD/LOR	Units	Method
Date of Receipt	05/04/2018										LOBILON	Onito	No.
Dicamba	<0.1										<0.1	ug/l	TM42/PM30
Dichloroprop	<0.1										<0.1	ug/l	TM42/PM30
Diclofop	<0.1										<0.1	ug/l	TM42/PM30
Fenoprop	<0.1										<0.1	ug/l	TM42/PM30
Flamprop	<0.1										<0.1	ug/l	TM42/PM30
Flamprop – isopropyl	<0.1										<0.1	ug/l	TM42/PM30
loxynil	<0.1										<0.1	ug/l	TM42/PM30
MCPA	<0.1							<u>ر</u> و.			<0.1	ug/l	TM42/PM30
МСРВ	<0.1							ortis			<0.1	ug/l	TM42/PM30
Месоргор	<0.1						, d	() C			<0.1	ug/l	TM42/PM30
Picloram	<0.1						ally any				<0.1	ug/l	TM42/PM30
Pentachlorophenol	<0.1					్లా	, for				<0.1	ug/l	TM42/PM30
2,4,5 - T	<0.1						jU				<0.1	ug/l	TM42/PM30
2,3,6 - TBA	<0.1					Puredy.					<0.1	ug/l	TM42/PM30
Triclopyr	<0.1				or inspection or inspection copyright of	NHET					<0.1	ug/l	TM42/PM30
Atrazine	<0.02 <sub>AA</sub>				inspito						<0.01	ug/l	TM149/PM3
Simazine	<0.04 <sub>AB</sub>			Ŷ	or vite						<0.01	ug/l	TM149/PM30
enna	NOTO TAB			c	602 ·						10101	ug,	
PCB 28	<0.1			NO							<0.1	ug/l	TM17/PM30
PCB 52	<0.1			ansel							<0.1	ug/l	TM17/PM30
PCB 101	<0.1			C <sup>O*</sup>							<0.1	ug/l	TM17/PM30
PCB 118	<0.1										<0.1	ug/l	TM17/PM30
PCB 138	<0.1										<0.1	ug/l	TM17/PM30
PCB 153	<0.1										<0.1	ug/l	TM17/PM30
PCB 180	<0.1										<0.1	ug/l	TM17/PM30
Total 7 PCBs	<0.7										<0.7	ug/l	TM17/PM30
Fluoride	0.7										<0.3	mg/l	TM173/PM0
Chloride	2137.0										<0.3	mg/l	TM38/PM0
Total Cyanide	0.16										<0.01	mg/l	TM89/PM0
Dissolved Methane	9985**										<1	ug/l	TM25/PM0
Monuron	<0.10 <sup>SV</sup> AC										<0.01	ug/l	TM97/PM55
Diuron	0.11 <sup>SV</sup> AC										<0.01	ug/l	TM97/PM55
Linuron	<0.10 <sup>SV</sup> AC										<0.01	ug/l	TM97/PM55
	00007-										-	<i></i>	Th (200 - 20
Electrical Conductivity @25C	20227										<2	uS/cm	TM76/PM0
Glyphosate*	120.0										<0.2	ug/l	Subcontracte
pH Total Organia Carbon	7.81										<0.01	pH units	TM73/PM0
Total Organic Carbon	1399										<2	mg/l	TM60/PM0

	ronmenta	•										
Client Name: Reference:	O'Callagha 18-211-04			es			SVOC Re	port :	Liquid			
Location:	Knockharl	-	Leachate									
Contact:	Neil Sande	es										
JE Job No.:	18/4994											
J E Sample No.	1-10											
Sample ID	Lagoon											
Depth										Please see	e attached r	otes for all
COC No / misc											ations and a	
Containers	V N P G											
Sample Date Sample Type	04/04/2018 Leachate											
Batch Number	1											Method
Date of Receipt	05/04/2018									LOD/LOR	Units	No.
SVOC MS												
Phenois	10											TMAC/DMAX
2-Chlorophenol 2-Methylphenol	<10 <sub>AC</sub> 40.9 <sub>AC</sub>									<1 <0.5	ug/l ug/l	TM16/PM30 TM16/PM30
2-Nitrophenol	<5.0 <sub>AC</sub>									<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol	<5.0 <sub>AC</sub>									<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<10 <sub>AC</sub>									<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol	<5.0 <sub>AC</sub>									<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<10 <sub>AC</sub>									<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol	<5.0 <sub>AC</sub>									<0.5	ug/l	TM16/PM30
4-Methylphenol 4-Nitrophenol	216 <sub>AC</sub>									<1 <10	ug/l ug/l	TM16/PM30 TM16/PM30
Pentachlorophenol	<100 <sub>AC</sub> <10 <sub>AC</sub>									<10	ug/i ug/i	TM16/PM30
Phenol	56 <sub>AC</sub>									<1	ug/l	TM16/PM30
PAHs											-	
2-Chloronaphthalene	<10 <sub>AC</sub>									<1	ug/l	TM16/PM30
2-Methylnaphthalene	<10 <sub>AC</sub>							se.		<1	ug/l	TM16/PM30
Naphthalene	<10 <sub>AC</sub>							et		<1	ug/l	TM16/PM30
Acenaphthylene	<5.0 <sub>AC</sub>						d d	<u>,</u>		<0.5 <1	ug/l	TM16/PM30 TM16/PM30
Acenaphthene Fluorene	<10 <sub>AC</sub> <5.0 <sub>AC</sub>						113. 313			<0.5	ug/l ug/l	TM16/PM30
Phenanthrene	<5.0 <sub>AC</sub>					.e5	101			<0.5	ug/l	TM16/PM30
Anthracene	<5.0 <sub>AC</sub>					100°is	<sup>C</sup>			<0.5	ug/l	TM16/PM30
Fluoranthene	<5.0 <sub>AC</sub>					Drivedh				<0.5	ug/l	TM16/PM30
Pyrene	<5.0 <sub>AC</sub>				di <sup>0</sup>	ret				<0.5	ug/l	TM16/PM30
Benzo(a)anthracene	<5.0 <sub>AC</sub>				- Se ó	AV.				<0.5	ug/l	TM16/PM30 TM16/PM30
Chrysene Benzo(bk)fluoranthene	<5.0 <sub>AC</sub> <10 <sub>AC</sub>				in one					<0.5 <1	ug/l ug/l	TM16/PM30
Benzo(a)pyrene	<10 <sub>AC</sub>			Ŷ	New					<1	ug/l	TM16/PM30
Indeno(123cd)pyrene	<10 <sub>AC</sub>			\$	iox.					<1	ug/l	TM16/PM30
Dibenzo(ah)anthracene	<5.0 <sub>AC</sub>			NOT						<0.5	ug/l	TM16/PM30
Benzo(ghi)perylene	<5.0 <sub>AC</sub>			nser						<0.5	ug/l	TM16/PM30
Phthalates			(	Cor								
Bis(2-ethylhexyl) phthalate	<50 <sub>AC</sub>						ator any o			<5	ug/l	TM16/PM30
Butylbenzyl phthalate Di-n-butyl phthalate	<10 <sub>AC</sub> <15.0 <sub>AC</sub>									<1 <1.5	ug/l ug/l	TM16/PM30 TM16/PM30
Di-n-Octyl phthalate	<15.0 <sub>AC</sub>									<1.5	ug/i ug/i	TM16/PM30
Diethyl phthalate	<10 <sub>AC</sub>									<1	ug/l	TM16/PM30
Dimethyl phthalate	<10 <sub>AC</sub>									<1	ug/l	TM16/PM30
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												1
												1

Date of Receipt      05/04/2018      Other      Other SVOCs	Exova Jones Enviro	onmenta	l									
JE Sample No.    1-10    Image: margina	Reference:	18-211-04	Ļ	es			SVOC Re	port :	Liquid			
JE Sample No.      1-10      Image: Constraint of the sector of the												
Sample ID      Lagoon      Lagoon      Lagoon      Lagoon      Please see attached notes abbreviations and acotes abbreviate abbreviates abbreviations and acotes abbreviations and acotes a	JE Job No.:	18/4994										
Image: Construct of the second of the sec	J E Sample No.	1-10										
Image: Construct of the second of the sec												
COC No / misc ContainersV N P G 04/04/2018Image: Containers 04/04/2018V N P G 04/04/2018Image: Containers 04/04/2018V N P G 04/04/2018Image: Containers 04/04/2018Image: Contai	Sample ID	Lagoon										
COC No / misc ContainersV N P G 04/04/2018Image: Containers 04/04/2018V N P G 04/04/2018Image: Containers 04/04/2018V N P G 04/04/2018Image: Containers 04/04/2018Image: Contai	Depth									 Please se	e attached r	notes for all
Sample Date Sample Type Batch NumberLeachate 1Image: Constraint of the sector of												
Sample Type Batch Number Date of ReceiptLeachate 1 05/04/2018Leachate 1 05/04/2018Image: Constraint of	Containers	V N P G										
Batch Number111 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>												
Date of Receipt $05/04/2018$ Image: Comparison of the sector of the												T
SVOC MS      Image: Constraint of the synchronization of										LOD/LOR	Units	Method No.
Other SVOCsIII <th< td=""><td></td><td>00/04/2010</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>		00/04/2010										
1.2.4-Trichlorobenzene $10_{AC}$												1
1.3-Dichlorobenzene $10_{AC}$ $11_{A}$ $10_{AC}$ $11_{A}$ </td <td>1,2-Dichlorobenzene</td> <td>&lt;10<sub>AC</sub></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>&lt;1</td> <td>ug/l</td> <td>TM16/PM30</td>	1,2-Dichlorobenzene	<10 <sub>AC</sub>								<1	ug/l	TM16/PM30
1.4-Dichlorobenzene $<10_{AC}$ $ug/l$ TM2-Nitroaniline $<10_{AC}$ $<1$ $ug/l$ TM2.4-Dinitrotoluene $<5.0_{AC}$ $<0$ $<0.5$ $ug/l$ TM2.6-Dinitrotoluene $<10_{AC}$ $<1$ $ug/l$ TM3-Nitroaniline $<10_{AC}$ $<1$ $ug/l$ TM4-Bromophenylphenylether $<10_{AC}$ $<1$ $ug/l$ TM4-Chloropaniline $<10_{AC}$ $<1$ $ug/l$ TM4-Chlorophenylphenylether $<10_{AC}$ $<1$ $ug/l$ TM4-Chlorophenylphenylether $<10_{AC}$ $<1$ $ug/l$ TM4-Chlorophenylphenylether $<10_{AC}$ $<1$ $ug/l$ TM4-Chlorophenylphenylether $<10_{AC}$ $<1$ $ug/l$ TM4-Chlorophenylphenylether $<10_{AC}$ $<1$ $ug/l$ TM4-Chlorophenylphenylether $<10_{AC}$ $<1$ $ug/l$ TM4-Chlorophenylphenylether $<10_{AC}$ $<1$ $ug/l$ TM4-Chlorophenylphenylether $<10_{AC}$ $<1$ $ug/l$ TM												TM16/PM30
2-Nitroaniline $<10_{AC}$ $ug/l$ TM2,4-Dinitrotoluene $<5.0_{AC}$ $<0.5$ $ug/l$ TM2,6-Dinitrotoluene $<10_{AC}$ $<1$ $ug/l$ TM3-Nitroaniline $<10_{AC}$ $<1$ $ug/l$ TM4-Bromophenylph												TM16/PM30
2,4-Dinitrotoluene  <0.5												TM16/PM30 TM16/PM30
2,6-Dinitrotoluene    <10 µg/l												TM16/PM30
3-Nitroaniline      <10 µg/l      TM        4-Bromophenylphenylether      <10 µg/l												TM16/PM30
4-Chloroaniline  <10 <sub>AC</sub> 4-Chlorophenylphenylether  <10 <sub>AC</sub> -1  ug/l    TM												TM16/PM30
4-Chlorophenylphenylether <10 <sub>AC</sub>		<10 <sub>AC</sub>										TM16/PM30
												TM16/PM30
ethoma      count      count <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>TM16/PM30 TM16/PM30</td></t<>												TM16/PM30 TM16/PM30
Concentry of the state of the stat												TM16/PM30 TM16/PM30
Bal2      Character      Character      Company      <												TM16/PM30
Carbacole      c5.0 ac (30a)      c5.0 ac (30a)      content (30a)      content (30a								<u>ی</u> .				TM16/PM30
Diberodiruna      c5.0 <sub>G</sub> ug0      T      ug0      T      ug0      T        Hoad-hrubutadisine      <10 <sub>G</sub>								of 112		<0.5		TM16/PM30
Headshotophate	Dibenzofuran							U.C.		<0.5		TM16/PM30
Hearchrobuiden      <10.0   <							NY. MY					TM16/PM30
critical control    c10ac    c1    c001    c1    c001    mit      isophorone    c50ac    c    c1    c001    c05    ug1    mit      isophorone    c50ac    c    c1    c05    ug1    mit      Nitosoft-propylatilie    c50ac    c    c10ac    c10ac    c10a						2	for a					TM16/PM30 TM16/PM30
Bophorune      -5.0 AC      -0.0 5      ugit      This        45.0 AC      -5.0 AC      -5.0 AC      -10.0 5      ugit      This        Sundpate Recovery p-Tephenyl-d14      89 AC      -10.0 5      ugit      This      -10.0 5      ugit      This        Sundpate Recovery p-Tephenyl-d14      89 AC      -10.0 5      ugit      This      -10.0 5      ugit      This        Sundpate Recovery p-Tephenyl-d14      89 AC      -10.0 5      ugit      This      -10.0 5      ugit      This        Sundpate Recovery p-Tephenyl-d14      89 AC      -10.0 5      ugit      This      -10.0 5      ugit      This        Sundpate Recovery p-Tephenyl-d14      89 AC      -10.0 5      ugit      This      -10.0 5      Ugit      This        Sundpate Recovery p-Tephenyl-d14      89 AC      -10.0 5      Ugit      This      -10.0 5      Ugit      This        Sundpate Recovery p-Tephenyl-d14      89 AC      -10.0 5      Ugit      This      -10.0 5      Ugit      This        Sundpate Recovery p-Tephenyl-d14      89 AC      -10.0 5      Ugit						005.00	Q.					TM16/PM30
Nntrosoci-n-propylamine      <5.0.c. ug/l      Tit        Ntrosoci-n-propylamine      <5.0.c. .						Ontholn						TM16/PM30
NitroBezone      <10/2      <1      up1      TA        Sungate Recovery 2-Florehend-141      83Ac      -      -      -      -      -      -      0      %      TA        Sungate Recovery 2-Florehend-141      82Ac      - <t< td=""><td>•</td><td></td><td></td><td></td><td>i o</td><td>at to</td><td></td><td></td><td></td><td></td><td></td><td>TM16/PM30</td></t<>	•				i o	at to						TM16/PM30
Sunctate Recovery 2-Flunctholphenyl      99Ac	Nitrobenzene				ectr	NIC				<1	ug/l	TM16/PM30
					instit							TM16/PM30
And and a set of the set of th	Surrogate Recovery p-Terphenyl-d14	82ac		Ŕ	St VILO					<0	%	TM16/PM30
				c (	0 <sup>2</sup> ,							
An and a set of the				x of								-
Image: sector of the sector				Selle								-
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Normal StateNormal State </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td>												-
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Exova Jones Envir	onmenta	l									
Client Name: Reference: Location: Contact:	O'Callagha 18-211-04 Knockharle Neil Sande	ey Landfill	es			VOC Rep	ort :	Liquid			
JE Job No.:	18/4994	55									
J E Sample No.	1-10								1		
o E oumple No.	110										
Sample ID	Lagoon										
Depth										e attached r	
COC No / misc Containers	VNDC								 abbrevia	ations and a	cronyms
Sample Date	V N P G 04/04/2018										
Sample Type	Leachate										
Batch Number	1								LOD/LOR	Units	Method No.
Date of Receipt	05/04/2018										NO.
Dichlorodifluoromethane	<2								<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether	2.8								<0.1	ug/l	TM15/PM10
Chloromethane	<3								<3	ug/l	TM15/PM10
Vinyl Chloride	0.5								<0.1	ug/l	TM15/PM10 TM15/PM10
Bromomethane Chloroethane	<1 <3								<1 <3	ug/l ug/l	TM15/PM10 TM15/PM10
Trichlorofluoromethane	<3								<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE)	<3								<3	ug/l	TM15/PM10
Dichloromethane (DCM)	<5								<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene 1,1-Dichloroethane	<3 <3								<3 <3	ug/l ug/l	TM15/PM10 TM15/PM10
cis-1-2-Dichloroethene	<3								<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1								<1	ug/l	TM15/PM10
Bromochloromethane	<2								<2	ug/l	TM15/PM10
Chloroform 1,1,1-Trichloroethane	<2 <2						Ø.•		<2 <2	ug/l ug/l	TM15/PM10 TM15/PM10
1,1-Dichloropropene	<3						1150		<2	ug/l	TM15/PM10
Carbon tetrachloride	<2					ć	her		<2	ug/l	TM15/PM10
1,2-Dichloroethane	<2					19.07			<2	ug/l	TM15/PM10
Benzene	3.9				) م	off of the			<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) 1,2-Dichloropropane	<3 <2				005.00	\$°,			<3 <2	ug/l ug/l	TM15/PM10 TM15/PM10
Dibromomethane	<3				DILLOUIN	alty. any o			<3	ug/l	TM15/PM10
Bromodichloromethane	<2			il	a of the				<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2			- Per ó	NI				<2	ug/l	TM15/PM10
Toluene trans-1-3-Dichloropropene	47 <2			the fit					<5 <2	ug/l ug/l	TM15/PM10 TM15/PM10
1,1,2-Trichloroethane	<2		Ŷ	and the					<2	ug/l	TM15/PM10
Tetrachloroethene (PCE)	<3		S	60×					<3	ug/l	TM15/PM10
1,3-Dichloropropane	<2		ont						<2	ug/l	TM15/PM10
Dibromochloromethane 1,2-Dibromoethane	<2 <2		ORSC						<2 <2	ug/l ug/l	TM15/PM10 TM15/PM10
Chlorobenzene	<2								<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane	<2								<2	ug/l	TM15/PM10
Ethylbenzene	11								<1	ug/l	TM15/PM10
p/m-Xylene	17								<2	ug/l	TM15/PM10 TM15/PM10
o-Xylene Styrene	10 <2								<1 <2	ug/l ug/l	TM15/PM10 TM15/PM10
Bromoform	<2								<2	ug/l	TM15/PM10
Isopropylbenzene	<3								<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4								<4	ug/l	TM15/PM10
Bromobenzene 1,2,3-Trichloropropane	<2 <3								<2 <3	ug/l ug/l	TM15/PM10 TM15/PM10
Propylbenzene	<3								<3 <3	ug/i ug/i	TM15/PM10
2-Chlorotoluene	<3								<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene	<3								<3	ug/l	TM15/PM10
4-Chlorotoluene	<3 <3								<3 <3	ug/l	TM15/PM10 TM15/PM10
tert-Butylbenzene 1,2,4-Trimethylbenzene	<3 6								<3 <3	ug/l ug/l	TM15/PM10 TM15/PM10
sec-Butylbenzene	<3								<3	ug/l	TM15/PM10
4-Isopropyltoluene	45								<3	ug/l	TM15/PM10
1,3-Dichlorobenzene	<3								<3	ug/l	TM15/PM10
1,4-Dichlorobenzene n-Butylbenzene	<3 <3								<3 <3	ug/l ug/l	TM15/PM10 TM15/PM10
1,2-Dichlorobenzene	<3								<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2								<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3								<3	ug/l	TM15/PM10
Hexachlorobutadiene Naphthalene	<3 <2								<3 <2	ug/l ug/l	TM15/PM10 TM15/PM10
1,2,3-Trichlorobenzene	<2 <3								<2 <3	ug/i ug/i	TM15/PM10
Surrogate Recovery Toluene D8	-								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	147								<0	%	TM15/PM10

Job number:	18/4994	Method:	SVOC
Sample number:	8	Matrix:	Liquid
Sample identity:	Lagoon		
Sample depth:			
Sample Type:	Leachate		
Units:	ug/l		
Note: Only samples with TICs	(if requested) are reported. If TICs	wore requested b	ut no compounds fo

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
10544-50-0	Cyclic octaatomic sulfur	11.478	97	1926
		Ø1*		
		ther USU		
	For inspection purposes For inspection purposes For inspection met require	all'ally our		
	مېرې	dfor		
	- Purperin	ĺ		
	action of the sector of the se			
	on instanto			
	- Contraction of the contraction			
	antlot			
	Cote			

**Notification of Deviating Samples** 

Client Name:	O'Callaghan Moran & Associates
Reference:	18-211-04
Location:	Knockharley Landfill Leachate
Contact:	Neil Sandes

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
					No deviating sample report results for job 18/4994	
					A 1150.	
					offe	
					olivian	
					Consent of convict on the required for any other type.	
					n put requir	
					ection net	
					- High	
					CONTRACTION OF THE CONTRACT.	
					and the second s	
					- Oliseti	
					C .	

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

### NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/4994

#### SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is guoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCI (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

#### WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation. 0 for

As surface waters require different sample preparation to groundwaters the additory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total liphatics C10-C40. . Hat

#### **DEVIATING SAMPLES**

For Samples must be received in a condition appropriate to the received analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report. Cor

#### SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

#### DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

### **BI ANKS**

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

#### NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other guality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

#### **REPORTS FROM THE SOUTH AFRICA LABORATORY**

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

### ABBREVIATIONS and ACRONYMS USED

#    ISO17025 (UKAS Ref No. 4225) accredited - UK.      SA    ISO17025 (SANAS Ref No. 10729) accredited - South Africa.      B    Indicates analyte found in associated method blank.      DR    Dilution required.      M    MCERTS accredited.      NA    Not applicable      NAD    No Asbestos Detected.      ND    None Detecride (usually refers to VOC and/SVOC TICs).      NDP    No Determination Possible      SS    Calibrated against a single substance      SV    Surrogate recovery outside performance criteria. This may be due to a matrix effect.      W    Results expressed on as received basis.      +    AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.      ++    Result outside calibration range, results should be considered as indicative only and are not accredited.      *    Analysis subcontracted to a Jones Environmental approved laboratory.      AD    Samples are dried at 35°C ±5°C      CO    Suspected carry over      LOD/LOR    Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS      ME    Matrix Effect      NFD    No Fibres Detected      Blank Sample    Optore transferee <th></th> <th></th>		
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NA    Not applicable      NAD    No Asbestos Detected.      ND    None Detected (usually refers to VOC and/SVOC TICs).      NDP    No Determination Possible      SS    Calibrated against a single substance      SV    Surrogate recovery outside performance criteria. This may be due to a matrix effect.      W    Results expressed on as received basis.      +    AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.      ++    Result outside calibration range, results should be considered as indicative only and are not accredited.      *    Analysis subcontracted to a Jones Environmental approved laboratory.      AD    Samples are dried at 35°C ±5°C      CO    Suspected carry over      LOD/LOR    Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS      ME    Matrix Effect      NFD    No Fibres Detected      BS    AQC Sample      OC    Outside Calibration Range      OC    Outside Calibration Range <td>DR</td> <td>Dilution required.</td>	DR	Dilution required.
NAD    No Asbestos Detected.      ND    None Detected (usually refers to VOC and/SVOC TICs).      NDP    No Determination Possible      SS    Calibrated against a single substance      SV    Surrogate recovery outside performance criteria. This may be due to a matrix effect.      W    Results expressed on as received basis.      +    ACC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.      ++    Results outside calibration range, results should be considered as indicative only and are not accredited.      *    Analysis subcontracted to a Jones Environmental approved laboratory.      AD    Samples are dried at 35°C ±5°C      CO    Suspected carry over      LOD/LOR    Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS      ME    Matrix Effect      NFD    No Fibres Detected      SB    ACC Sample      ME    Blank Sample      OC    Outside Calibration Range      OC    Outside Calibration Range      OC    Outside Calibration Range      AB    x4 Dilution      Ka    x2 Dilution	М	MCERTS accredited.
ND    None Detected (usually refers to VOC and/SVOC TICs).      NDP    No Determination Possible      SS    Calibrated against a single substance      SV    Surrogate recovery outside performance criteria. This may be due to a matrix effect.      W    Results expressed on as received basis.      +    AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.      ++    Result outside calibration range, results should be considered as indicative only and are not accredited.      *    Analysis subcontracted to a Jones Environmental approved laboratory.      AD    Samples are dried at 35°C ±5°C      CO    Suspected carry over      LOD/LOR    Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS      ME    Matrix Effect      NFD    No Fibres Detected      BS    AQC Sample      LB    Blank Sample      ME    Matrix Effect      N    Client Sample      OC    Outside Calibration Range      OC    Outside Calibration Range      OC    Outside Calibration Range      OC    Outside Calibration Range      AA    x2 Dilution      AB <td< td=""><td>NA</td><td>Not applicable</td></td<>	NA	Not applicable
NDP    No Determination Possible      SS    Calibrated against a single substance      SV    Surrogate recovery outside performance criteria. This may be due to a matrix effect.      W    Results expressed on as received basis.      +    AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.      ++    Result outside calibration range, results should be considered as indicative only and are not accredited.      *    Analysis subcontracted to a Jones Environmental approved laboratory.      AD    Samples are dried at 35°C ±5°C      CO    Suspected carry over      LOD/LOR    Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS      ME    Matrix Effect      NFD    No Fibres Detected      BS    AQC Sample      LB    Blank Sample      OC    Outside Calibration Range      OC    Outside Calibration Range      AA    x2 Dilution      AB    x4 Dilution	NAD	No Asbestos Detected.
SS    Calibrated against a single substance      SV    Surrogate recovery outside performance criteria. This may be due to a matrix effect.      W    Results expressed on as received basis.      +    AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.      ++    Result outside calibration range, results should be considered as indicative only and are not accredited.      *    Analysis subcontracted to a Jones Environmental approved laboratory.      AD    Samples are dried at 35°C ±5°C      CO    Suspected carry over      LOD/LOR    Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS      ME    Matrix Effect      NFD    No Fibres Detected      BS    AQC Sample      LB    Blank Sample      OC    Outside Calibration Range      OC    Outside Calibration Range      OC    Outside Calibration Range      AA    x2 Dilution      AB    x4 Dilution      K    Ka      K    Ka      K    Ka      K    Ka      K    Ka      K    Ka      K    Ka <td>ND</td> <td>None Detected (usually refers to VOC and/SVOC TICs).</td>	ND	None Detected (usually refers to VOC and/SVOC TICs).
SV    Surrogate recovery outside performance criteria. This may be due to a matrix effect.      W    Results expressed on as received basis.      +    AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.      ++    Result outside calibration range, results should be considered as indicative only and are not accredited.      *    Analysis subcontracted to a Jones Environmental approved laboratory.      AD    Samples are dried at 35°C ±5°C      CO    Suspected carry over      LOD/LOR    Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS      ME    Matrix Effect      NFD    No Fibres Detected      BS    AQC Sample      LB    Blank Sample      ME    Matrix Effect      TB    Trip Blank Sample      OC    Outside Calibration Range      AA    x2 Dilution      AA    x2 Dilution      AB    x4 Dilution	NDP	No Determination Possible
W    Results expressed on as received basis.      +    AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.      ++    Result outside calibration range, results should be considered as indicative only and are not accredited.      *    Analysis subcontracted to a Jones Environmental approved laboratory.      AD    Samples are dried at 35°C ±5°C      CO    Suspected carry over      LOD/LOR    Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS      ME    Matrix Effect      NFD    No Fibres Detected      BS    AQC Sample      LB    Blank Sample      N    Client Sample      OC    Outside Calibration Range      AA    x2 Dilution      AA    x2 Dilution      AA    x10 Dilution	SS	Calibrated against a single substance
+    AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.      ++    Result outside calibration range, results should be considered as indicative only and are not accredited.      *    Analysis subcontracted to a Jones Environmental approved laboratory.      AD    Samples are dried at 35°C ±5°C      CO    Suspected carry over      LOD/LOR    Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS      ME    Matrix Effect      NFD    No Fibres Detected      BS    AQC Sample      LB    Blank Sample      MB    Trip Blank Sample      OC    Outside Calibration Range      AA    x2 Dilution      AA    x2 Dilution      AA    x10 Dilution	SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
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AD    Samples are dried at 35°C ±5°C      CO    Suspected carry over      LOD/LOR    Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS      ME    Matrix Effect      NFD    No Fibres Detected      BS    AQC Sample      LB    Blank Sample      N    Client Sample      OC    Outside Calibration Range      AA    x2 Dilution      AB    x4 Dilution      AC    x10 Dilution	++	Result outside calibration range, results should be considered as indicative only and are not accredited.
CO    Suspected carry over      LOD/LOR    Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS      ME    Matrix Effect      NFD    No Fibres Detected      BS    AQC Sample      LB    Blank Sample      N    Client Sample      OC    Outside Calibration Range      AA    x2 Dilution      AB    x4 Dilution      K10 Dilution    For protection	*	Analysis subcontracted to a Jones Environmental approved laboratory.
LOD/LOR    Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS      ME    Matrix Effect      NFD    No Fibres Detected      BS    AQC Sample      LB    Blank Sample    Offer      N    Client Sample    Offer      OC    Outside Calibration Range    Outside Calibration Range      AA    x2 Dilution    Teopretion      AB    x4 Dilution    For product	AD	Samples are dried at 35°C ±5°C
ME  Matrix Effect    NFD  No Fibres Detected    BS  AQC Sample    LB  Blank Sample    N  Client Sample    TB  Trip Blank Sample    OC  Outside Calibration Range    AA  x2 Dilution    AB  x4 Dilution	CO	Suspected carry over
NFD    No Fibres Detected      BS    AQC Sample      LB    Blank Sample      N    Client Sample      TB    Trip Blank Sample      OC    Outside Calibration Range      AA    x2 Dilution      AB    x4 Dilution      AC    x10 Dilution	LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
TB  Trip Blank Sample    OC  Outside Calibration Range    AA  x2 Dilution    AB  x4 Dilution    AC  x10 Dilution	ME	
TB  Trip Blank Sample    OC  Outside Calibration Range    AA  x2 Dilution    AB  x4 Dilution    AC  x10 Dilution	NFD	No Fibres Detected
TB  Trip Blank Sample    OC  Outside Calibration Range    AA  x2 Dilution    AB  x4 Dilution    AC  x10 Dilution	BS	AQC Sample
TB  Trip Blank Sample    OC  Outside Calibration Range    AA  x2 Dilution    AB  x4 Dilution    AC  x10 Dilution	LB	Blank Sample
TB  Trip Blank Sample    OC  Outside Calibration Range    AA  x2 Dilution    AB  x4 Dilution    AC  x10 Dilution	Ν	Client Sample
OC  Outside Calibration Range  ction    AA  x2 Dilution  inspection metric    AB  x4 Dilution  for protection    AC  x10 Dilution  for protection    AD  x20 Dilution  sector	ТВ	Trip Blank Sample
AA  x2 Dilution  used to the second se	OC	Outside Calibration Range
AB  x4 Dilution  for file    AC  x10 Dilution  of contract    AD  x20 Dilution  gent	AA	x2 Dilution
AC  x10 Dilution    AD  x20 Dilution	AB	x4 Dilution for price
AD x20 Dilution	AC	x10 Dilution
	AD	x20 Dilution
AE x40 Dilution	AE	x40 Dilution
AF x500 Dilution	AF	x500 Dilution

# Method Code Appendix

#### **JE Job No:** 18/4994

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM25	Determintaion of Dissolved Methane, Ethane and Ethene by Headspace GC-FID	PM0	No preparation is required.				
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	18					
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PMOOT COP	No preparation is required.				
TM42	Modified US EPA method 8270. Pesticides and herbicdes by GC-MS	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.				
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.				
TM76	Modified US EPA method 120.1. Determination of Specific Conductance by Metrohm automated probe analyser.	PM0	No preparation is required.				

#### **JE Job No:** 18/4994

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.				
TM97	Determination of specific Uron Herbicides using Reversed Phase High Performance Liquid Chromatography and Mass Spectroscopy detection.	PM55	Liquid samples are passed through a Solid Phase Extraction (SPE) column under vacuum and a solvent of appropriate polarity (Methanol) is used to elute the analytes from the column. Solid samples are extracted with solvent by End over End.				
TM149	Determination of Pesticides by Large Volume Injection on GC Triple Quad MS, based upon USEPA method 8270	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM0	No preparation, is required.				
Subcontracted	Subcontracted analysis, sent to an ISO 17025 accredited laboratory where possible.	cori	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
		onsent of cop	מ				
		C					